NASA Ames Development Plan

Final Programmatic Environmental Impact Statement

NASA Ames Research Center

July 2002

DESIGN, COMMUNITY & ENVIRONMENT

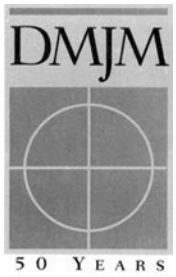
NASA AMES DEVELOPMENT PLAN

FINAL PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

VOLUME I

NASA AMES RESEARCH CENTER

JULY 2002



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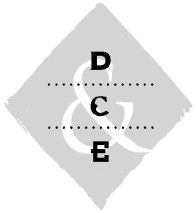

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EXECUTIVE SUMMARY

This NASA Ames Development Plan Final Programmatic Environmental Impact Statement (EIS) has been prepared for the National Aeronautics and Space Administration (NASA). The purpose of this report is to assess the environmental consequences associated with development under the proposed NASA Ames Development Plan (NADP), which is intended to bring new research and development uses to the NASA Ames Research Center (ARC) in Santa Clara County, California. This EIS has been prepared pursuant to the National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321 *et seq.),* and according to the Procedures for Implementation of NEPA for NASA (CFR Title 14 Part 1216 subpart 1216.3).

As required by federal law, this summary presents an overview of the analysis contained in the EIS. NEPA requires that this chapter summarize major conclusions of this EIS, including: 1) project and alternatives; 2) areas of controversy; 3) significant impacts; 4) unavoidable significant impacts and 5) implementation of mitigation measures.

The last section of this Executive Summary includes a summary of changes made to the Draft Programmatic EIS to create this Final Programmatic EIS.

A. Project and Alternatives

1. Study Area

The Study Area consists of approximately 600 hectares (1,500 acres) of land, or almost all of the land under NASA's control within Ames Research Center. ARC is located on approximately 800 hectares (2,000 acres) of land between Highway 101 and the southwestern edge of the San Francisco Bay in the northern portion of Santa Clara County. The Study Area is divided into four sub-areas, as shown in Figures 1-3 through 1-7:

- **NASA Research Park:** an 86-hectare (213-acre), roughly triangular site located between the airfield, Highway 101, and the original Ames Research Center campus. This area includes most of the Shenandoah Plaza National Historic District, except Berry Court and Hangars 2 and 3. Current uses in the NASA Research Park (NRP) area include office space, retail and

business services, airfield operations, vehicle maintenance, research facilities and storage, some of which are used by the Army Reserve, Department of Defense Commissary and Exchange, and the Air National Guard. The existing buildings within the NRP area contain approximately 150,000 square meters (1.6 million square feet) of space.

— **Eastside/Airfield:** a 385-hectare (952-acre) site comprised of the airfield and the lands to the east of it. Current uses include the golf course, Hangars 2 and 3, and the airfield operations, fueling, and munitions storage facilities of the California Air National Guard (CANG). The existing buildings within the Eastside/Airfield area contain approximately 80,000 square meters (860,000 square feet) of space.

— **Bay View:** a 38-hectare (95-acre) site immediately north of the original Ames Research Center campus. This land is predominantly undeveloped upland grassland containing a few research facilities such as the Outdoor Aerodynamic Research Facility.

— **Ames Campus**: the original 94-hectare (234-acre) site of Ames Research Center. This area was referred to as the Existing ARC Facilities in the Notice of Intent filed in June 2000, and in scoping meetings held in July 2000. Current uses in the Ames Campus area include office, research and development, and storage. The existing buildings in the Ames Campus area contain approximately 268,000 square meters (2.89 million square feet) of space.

2. Project Alternatives

This EIS evaluates five alternatives for new development in ARC under the NADP, as summarized in Table 2.1:

— **Alternative 1: The No Project Alternative.** Under the No Project Alternative, no new development would be proposed for Ames Research Center at this time. However, NASA would implement several projects already approved, as described in Chapter 2, so that "No Action," the typically-employed term under NEPA, would not accurately describe the baseline condition. In addition, "No Project" is the CEQA equivalent of

"No Action" and so very familiar to the public reading the document. Thus Ames Research Center staff have determined that this alternative should be referred to as "No Project" rather than "No Action" in order to minimize confusion for the public.

— **Alternative 2.** Alternative 2 proposes to develop approximately 363,000 square meters (3.9 million square feet) of new space in the NRP, Bay View, and Eastside/ Airfield areas. Within the NRP area, there would be approximately 192,000 square meters (2.1 million square feet) of new educational, office, research and development, museum, conference center, housing and retail development, approximately 52,000 square meters (560,000 square feet) of existing non-historic structures would be demolished, and approximately 46,000 square meters (500,000 square feet) of existing space would be renovated. Alternative 2 proposes approximately 121,000 square meters (1.3 million square feet) of new educational and housing development in the Bay View area, and approximately 51,000 square meters (550,000 square feet) of new low-density research and development and light industrial space, in addition to the renovation of Hangars 2 and 3, in the Eastside/Airfield area. Total build out[1] under this alternative would be approximately 845,000 square meters (9.1 million square feet). Alternative 2 would generate 13,068 new employees, approximately 2,600 students, and house 2,010 residents in 738 housing units within the study area.

— **Alternative 3.** Based on the ideas of Traditional Neighborhood Design, Alternative 3 would create a new mixed-use development within the NASA Research Park area. Alternative 3 proposes the addition of approximately 284,000 square meters (3 million square feet) of new educational, office, research and development, museum, conference center, housing and retail development, the demolition of approximately 52,000 square meters (560,000 square feet) of non-historic structures, and the

[1] The total amount of square footage of space at the Ames Research Center once all of the construction and demolition associated with this Alternative were complete.

renovation of approximately 46,000 square meters (500,000 square feet) of existing space. Alternative 3 does not propose any new construction in the Bay View or Eastside/Airfield areas, although Hangars 2 and 3 in the latter area would be renovated for low-intensity research and development or light industrial uses. The total build out under this alternative would be approximately 760,000 square meters (8.2 million square feet). Alternative 3 would generate 11,047 new employees, approximately 2,600 students, and house 1,267 residents in 488 housing units within the study area.

— **Alternative 4.** Alternative 4 would concentrate more of the new development in the Bay View area than would the other alternatives, while creating less dense development in the NRP area. Alternative 4 proposes the addition of approximately 145,000 square meters (1.6 million square feet) of new educational, office, research and development, museum, conference center, housing and retail space in the NRP area, as well as the demolition of approximately 52,000 square meters (560,000 square feet) of non-historic structures and the renovation of approximately 46,000 square meters (500,000 square feet) of existing space. Alternative 4 also proposes approximately 251,000 square meters (2.7 million square feet) of new office, research and development, laboratory, educational, and student/faculty housing development in the Bay View area. In the Eastside/Airfield area, Alternative 4 proposes approximately 62,000 square meters (670,000 square feet) of new light industrial, research and development, office and educational facility development, as well as the renovation of the historic hangars. The total build out under Alternative 4 would be approximately 940,000 square meters (10.1 million square feet). Alternative 4 would generate 15,599 new employees, approximately 2,500 students, and house 2,574 residents in 914 housing units within the study area.

— **Alternative 5.** Under Alternative 5, there would be some new construction in each of the four development areas, but it would be concentrated primarily in the NRP area. Alternative 5 proposes the addition of approximately 192,000 square meters (2.1 million square) feet of new educational, office, research and development, museum, conference

center, housing and retail space in the NRP Area, as well as the demolition of approximately 52,000 square meters (560,000 square feet) of non-historic structures and the renovation of approximately 56,000 square meters (600,000 square feet) of existing space. It also proposes the addition of approximately 93,000 square meters (1 million square feet) of new development in the Bay View area, primarily for housing. In the Eastside/Airfield area, Alternative 5 proposes the construction of approximately 1,100 square meters (12,000 square feet) of new space in a new control tower. Finally, in the Ames Campus area, Alternative 5 includes the demolition of approximately 37,000 square meters (400,000 square feet) of existing buildings to make way for 46,000 square meters (500,000 square feet) of high density office and research and development space. Total build out under Alternative 5 would be approximately 777,000 square meters (8.4 million square feet). Alternative 5 would generate 7,222 new employees, approximately 3,000 students, and house 2,808 residents in 1,040 housing units within the study area.

NASA has selected Mitigated Alternative 5 as the Preferred Alternative. The Preferred Alternative has been identified as the option that best meets NASA's purpose and need. Mitigated Alternative 5 would generate 7,088 new employees, approximately 3,000 students, and house 4,909 residents in 1,930 housing units.

3. Project Purpose and Need

Proposed development under the NASA Ames Development Plan (NADP) would further NASA's mission by providing the critical mass of scholars and engineers necessary to create a vital research and educational community focused on the advancement of human knowledge about space, the Earth, and society. Under the NADP, the research and educational community at NASA Ames would consist of federal agencies, universities, private industry and non-profit organizations.

A secondary purpose of the project is to allow for on-going stability throughout ARC, an enhancement of its research capabilities, and efficient use of its land.

By integrating public and private research and development efforts, the expanded Ames Research Center would serve as a hub of technology transfer. Collaboration with NASA's development partners would keep ARC's researchers involved in cutting-edge technology advances in Silicon Valley, the San Francisco Bay Area and beyond, and promote commercial applications of the basic scientific research done at Ames Research Center.

B. Areas of Controversy and Issues Identified During Scoping

Over the past decade, there has been significant public concern over the future of Ames Research Center at Moffett Field. Residents of the City of Sunnyvale and the City of Mountain View have been particularly concerned due to their close proximity to ARC.

In 1996, NASA considered allowing the Air Force to host commercial air cargo members of the Department of Defense's (DOD) Civil Reserve Air Fleet (CRAF) at Moffett Field to augment DOD military airlift needs with civil air carrier resources, and to reduce NASA's net costs for operating the airfield. The result was great opposition from surrounding communities and the withdrawal of NASA's plan. In November 1996, the neighboring cities of Mountain View and Sunnyvale appointed a 19-member Citizens Advisory Committee (CAC) to study and provide input to NASA about the best uses of Moffett Field. The Director of Ames Research Center, Dr. Henry McDonald, led the development of NASA's six point initiative, which outlined program goals and reuse concepts for the development of the former Navy base. After extensive public outreach and numerous public meetings, the Final Report of the Community Advisory Committee endorsed NASA's six point initiative.

Ames has continued to work with the neighboring communities in preparing its preferred development plan. On December 8, 1998, NASA unveiled its visionary concept for a shared-use R&D and education campus. This planning process has continued since then, and is now culminating in the NADP. In July 2000, a series of public scoping meetings were held for the Environmental Impact Statement. Particular areas of concern identified during the scoping meetings included the following:

- **Traffic:** Local residents have been concerned about the impacts of additional development at ARC on local and regional traffic conditions.
- **Air Quality:** Local residents and the Bay Area Air Quality Management District have been concerned about potential air quality impacts resulting from new development and the traffic it generates.
- **Noise:** Local residents have been concerned about noise from ARC, particularly related to wind tunnel and airfield operations.
- **Burrowing Owls:** Wildlife officials and advocates have voiced concerns about the impact on burrowing owls of additional development at ARC.
- **Wetlands:** ARC and its vicinity include wetlands, and local residents and employees have been concerned about potential impacts on these sensitive areas.
- **Recreational Space:** ARC employees have voiced concern about losses of recreational space that would result from new development under the NADP.
- **Historic Resources:** ARC has one historic district, the Shenandoah Plaza Historic District. In addition, there are other historic buildings in the Ames Campus area, most notably the wind tunnels described in Section 3.13. Historic preservationists have been concerned about possible impacts on these historic resources.
- **Hazardous Materials:** ARC is the site of existing hazardous material contamination. Community members and employees have expressed

concerns about possible exposure of new workers and residents to these hazardous materials.

— **Airfield Operations:** Some community members have voiced a desire that the ARC airfield be designated for possible civilian use and increased operations, while others have suggested reductions in or elimination of aircraft operations. While the NADP would not affect the airfield in any way, this issue continues to be controversial in the community.

C. Potential Areas of Significant Impact

Implementation of the NADP has the potential to generate environmental impacts in a number of areas. Impacts in the following areas could be significant without the implementation of mitigation measures, but most would be reduced to a less-than-significant level if the mitigation measures recommended in this report were implemented:

" Traffic
" Air Quality
" Infrastructure
" Services
" Hazardous Materials
" Geology
" Biology
" Noise
" Aesthetics
" Recreation
" Cultural Resources
" Socio-Economics

D. Mitigation Measures

This EIS suggests specific mitigation measures that would reduce most impacts identified above to less-than-significant levels, as summarized in Table 0-1.

E. Unavoidable Significant Impacts

The significant and unavoidable consequences that would occur with implementation of the Preferred Alternative:

CIR-1: Implementation of the proposed project would increase vehicle trips and traffic congestion on segments of Highways 101, 85, and 237 in the immediate vicinity of the Ames Campus, as well as on highway segments outside the local study area. On all nearby segments projected to operate at LOS F, the project would add more than one percent of capacity in at least one direction during the AM and/or PM peak hour. The project was also expected to add more than one per cent of capacity to nine highway segments outside the immediate vicinity of the project in Santa Clara County, as well as on several segments in adjacent counties. Under the Mitigated Alternative 5, the number of segments in Santa Clara County would be reduced to three and there would be no impacted segments in adjacent counties.

CIR-6: The increased level of vehicle and bicycle traffic through the Ellis Street underpass at Highway 101 resulting from the project would increase hazards for bicyclists, who share the standard travel lanes in this location. Although a mitigation measure for this impact is included in this FEIS, the feasibility of this mitigation measure still needs to be studied. If the mitigation measure is infeasible, this would be a significant and unavoidable impact.

AQ-1: Build out of the NASA Ames Development Plan would result in population and vehicle uses projections that are inconsistent with regional air quality planning, and in emissions of air pollutants from automobiles and

construction equipment which would exceed significance thresholds established by the BAAQMD.

SOCIO-1: Mitigated Alternative 5 would generate one percent or more of the new households in the Housing Impact Area between 2000 and 2015 and contribute to the regional jobs-housing imbalance.

F. Systems of Measurement

NASA policy dictates that all measurements should be written in the metric system. Most of the numbers in this document were originally computed using the English system of measurement, so they have been converted into the metric system and rounded to the nearest significant digit. Throughout the text of this EIS, the original English measurement follows the metric number in parentheses. For example, the size of a particular buildings would be listed as 9,000 square meters (100,000 square feet).

G. Summary Table

Table 0-1 presents a summary of impacts and mitigation measures identified in this report. Impacts are referenced in this summary table as they appear throughout this EIS. For more detail, please refer to the applicable sections of this document.

Table 0-2 presents an overview of which impacts apply to the five individual alternatives reviewed in this EIS.

H. Summary of Changes in this Final EIS

The public review period for the Draft Programmatic EIS extended from December 10, 2001 to January 28, 2002. During that time, various agencies,

organizations and individuals submitted comments on the Draft Programmatic EIS. Substantive comments made during this review period are responded to in this Final Programmatic EIS as required under NEPA. Changes to the Draft Programmatic EIS that resulted from comments have been incorporated into the Final Programmatic EIS, and are shown in Chapters 1 through 5 and referenced in Chapter 12. These changes apply to Mitigated Alternative 5, the Preferred Alternative. The major changes made in this Final Programmatic EIS are as follows:

1. Additional Housing as a Mitigation Measure

The most significant change to this EIS is the addition of a new mitigation measure to Section 4.14 (SOCIO-1b). Several commentors requested consideration of additional housing in the NADP to decrease the impact of the development on the Bay Area's existing jobs/housing imbalance. NASA has responded in this Final Programmatic EIS by developing a mitigation measure that would add 890 housing units to the proposed development, bringing the total on-site housing to 1,930 units. The additional housing is presented herein as a mitigation measure to Impact SOCIO-1. Chapter 5 of this FPEIS has been added to analyze the impacts of implementing Mitigation Measure SOCIO-1b.

Even with mitigation, the alternatives would generate workers who would not be housed on-site who would represent over one percent of the predicted new households in the Housing Impact Area through 2015. Hence, this impact would still be significant and unavoidable.

2. Recalculation of Fill Needed in Bay View

As described in the DPEIS, fill would be required in the Bay View area in order to prevent flooding. Fill would be used to bring the finished grade up to a finished height of 2 meters (7 feet) along the northern edge of the Bay View area, and slope upward to the south to conform to the existing ground at higher elevations. A recalculation of fill requirements concluded that fill would be placed over a 102,000 square meter (1,100,000 square foot) area with fill ranging in depth from 0.15 meter (0.5 feet) to 1.4 meters (4.5 feet), with an average depth of 1.2 meters (4.0 feet). The total volume of fill required would be

approximately 123,000 cubic meters (160,000 cubic yards). This amount of fill is significantly less than the 170,000 cubic meters (220,000 cubic yards) that was calculated in the DPEIS.

The amount of earth needed to haul the fill is expected to generate 12,300 truck loads or 24,600 truck trips over a two- to three-year period. Based on 250 working days per year, this equates to an average of approximately 33 to 49 truck trips per day likely using the Highway 101/Moffett Field interchange. These trips will be distributed throughout the day and are not expected to significantly affect peak period intersection operations at the ramps or on-site. These numbers are lower than those calculated for the DPEIS, where an estimated 17,000 truck loads or 34,000 truck trips were reported.

3. Increase to Wetlands Buffer

The open space buffer between development and the wetlands in the Bay View area (see Mitigation Measure BIO-19) has been increased to 61 meters (200 feet).

4. Stormwater Drainage Changes

NASA has revised the conceptual plan for the storm drain system to reduce off-site flows and pollutant loading. In Bay View, stormwater would be retained on-site in recreational areas, then flow through swales to a settling basin. From there, it would move on to the Eastern Diked Marsh and then to the stormwater retention pond, thereby eliminating the need to route water directly to Stevens Creek. In addition, there have been changes to the design of the NASA Research Park storm system to slow drainage flows to the stormwater retention pond.

5. Construction Buildout

Construction of the increased housing under Mitigated Alternative 5 would cause the project to be built out over 11 years, instead of 10 years, to keep NOx emissions below 91 tonnes (100 tons) per year, as required by the Clean Air Act.

6. Air Quality Impacts

The additional housing would cause emissions of reactive organic gases (ROG) that would exceed significance levels established by BAAQMD. This impact is described in Impact AQ-1.

7. Additional Changes

In addition, there were several other changes made to this Final Programmatic EIS. Each is briefly described below.

— **Traffic Analysis.** The text in Section 4.3 of the DPEIS indicated that the transportation analysis included 750 new employees associated with the Ames Research Center as part of the project. The analysis in fact included a building area for these employees that was equivalent to 1,300 employees or 550 more than actually proposed by NASA. Thus, the analysis presented in the DPEIS is overly conservative. Approximately 150 additional gross trips during both the AM and PM peak hours reflect trips made by the additional employees. The equivalent building area representing the correct number of employees (750) was used in the Mitigated Alternative 5 analysis to more accurately model impacts of the proposed project on intersections and freeway segments.

— **Best Management Practices for Stormwater Quality.** A series of Best Management Practices (BMPs) have been added to Chapter 2. NASA would implement these BMPs under the NADP.

— **Reassessment of School Impacts.** This Final Programmatic EIS contains a reassessment of the impact to schools resulting from implementation of the NADP. The reassessment found that the potential impact to elementary schools would be mitigated because development under the NADP would pay Developer Impact Fees that would be used by the Mountain View-Whisman School District to build new classrooms and other facilities. The reassessment also found that the plan, under Alternatives 2, 4, 5, and Mitigated Alternative 5, would generate operational costs to the local high school district that would exceed 0.5 percent of the district's annual revenue limit. This impact would be

mitigated by Mitigation Measure SOCIO-3, which states that should the Mountain View-Los Altos Union High School District's per student expenditures decrease below a pre-determined baseline as a direct result of enrollment generated by NADP, NASA's partners would compensate the District for the additional cost of these students. The baseline would be set to the year prior to when students generated by NADP first begin attending classes in the district, and would be adjusted for cost of living and inflationary changes over time.

— **Analysis of Bat Species.** Additional analysis of bat species was included in this Final Programmatic EIS based upon comments from the California Department of Fish and Game. Some of the bat species that could potentially occur at Ames Research Center (e.g. long-legged myotis, long-eared myotis, Townsend's big-eared bat, yuma myotis) are special-status species. Bats may forage for insects above wetland areas such as the Eastern and Western Diked Marshes and Storm Water Retention Pond in the North of Bay View area. While none of these special status bat species are known to occur at Ames Research Center, the Mexican free tail bat does roost in a number of the buildings.

— **Wetland Delineation.** The wetland delineation for NASA Ames Research Center was verified by the US Army Corps of Engineers (Corps) in May 2001. Verification is included in Appendix E of this document. Some of the seasonal wetlands identified in the Bay View area in the preliminary wetland delineation were eliminated from the final Corps verification based upon the human-induced ponding mechanism that, when removed, also removed wetland indicators from the ponded areas. Thus, the total area of verified wetlands in the Bay View area of 2.1 hectares (5.3 acres) is less than that identified in the preliminary delineation 2.2 hectares (5.5 acres). After the verification, NASA altered the building envelope in the Bay View area to avoid direct impacts to wetlands as a result of implementing the proposed action. There are no wetlands in the revised Bay View area. As a result, direct impacts to wetlands, as well as mitigation measures associated with the loss of wetland areas from

implementation of the proposed action have been removed from this Final Programmatic EIS.

— **New or Revised Impacts and Mitigation Measures.** Several commentors suggested amendments to mitigation measures, which have been incorporated into the Final Programmatic EIS. For example, a comment from the EPA lead to the addition of new air quality mitigation measures. In addition, several commentors suggested other new mitigation measures that have also been incorporated. The new and revised impacts and mitigation measures are as follows below.

Impact CIR-1: Implementation of the proposed project would increase vehicle trips and traffic congestion on segments of Highways 101, 85, and 237 in the immediate vicinity of the Ames Campus, as well as on highway segments outside the local study area. On all nearby segments projected to operate at LOS F, the project would add more than one percent of capacity in at least one direction during the AM and/or PM peak hour. The project is also expected to add more than one percent of capacity to numerous highway segments outside the immediate vicinity of the project in Santa Clara County, as well as on several segments in adjacent counties. Under the Mitigated Alternative 5, the number of segments would be reduced to three.

Mitigation Measure CIR-1: As part of the NADP, NASA and its partners would implement an aggressive Transportation Demand Management (TDM) program designed to reduce trip generation by a total of at least 22 percent. AVR goals are set for each phase of the TDM plan. Development will not proceed to the next phase until the previous phase's goal has been met. In addition, on-site housing would also help to reduce vehicle trip generation to external streets and freeways by internalizing trips to on-site employment centers and amenities.

To completely mitigate the highway impacts of the proposed project under any of the development alternatives, each highway segment would have to be widened to provide an additional travel lane in at least one direction or

other capacity improvements would have to be made. In many cases, widening is infeasible due to right-of-way constraints and the proximity of existing building structures and development. Immediately adjacent to the project site, for example, Highway 101 could not be widened because of the proximity of Manila Drive and the VTA light rail line. In addition, large-scale freeway widening projects are beyond the scope of a single project and could only garner a relatively small fair-share contribution towards the improvement. Therefore, despite the substantial trip reductions from implementation of the TDM program, the increase in vehicle trips and congestion on the highway system associated with implementation of the NADP would be a significant, unavoidable impact. NASA will work with VTA and Caltrans to consider other mitigations.

Impact CIR-6: The increased level of vehicle and bicycle traffic through the Ellis Street underpass at Highway 101 resulting from the project would increase hazards for bicyclists, who share the standard travel lanes in this location.

Mitigation Measure CIR-6: Development under the NADP would modify the Ellis Street underpass to better accommodate bicyclists.

One option would be to shift all of the vehicle travel lanes to the north by 4 to 5 meters (12 to 15 feet). Currently, two travel lanes are provided in each direction between three sets of concrete piers. By moving the westbound lane to the north side of the northernmost piers and shifting the other lanes accordingly, additional width could be provided to accommodate bicycle lanes. The northern abutment would have to be rebuilt with a retaining wall similar to the design that was implemented to accommodate the light rail tracks. If this option were implemented, bike lanes would be at least 1.5 meters (5 feet) wide, and adequate signage and lighting would be provided. Figure 4.3-6 illustrates this measure. The feasibility of this improvement would have to be evaluated by a structural engineer and by Caltrans since the intersection configurations at the two adjacent ramp intersections would have to be modified.

Another option would be modify the intersection to provide reversible 2.4-meter (8-foot) lanes that would allow for two lanes of car traffic and one lane of eastbound bike traffic in the morning and only one lane of car traffic and one lane for bikes in a westbound direction. In the afternoon/evening, the extra lane would provide westbound traffic flows. Again, adequate signage and lighting would be provided.

Implementation of this mitigation measure would reduce the potential impact on bicyclist safety to less-than-significant levels. If this improvement is determined to be infeasible and no alternative is found, then the impact would remain significant and unavoidable.

Impact CIR-7: Construction activity associated with the proposed improvements to facilities within Caltrans right-of-way has the potential to introduce pollutant laden runoff into the storm drain system.

Mitigation Measure CIR-7: Improvements to facilities within Caltrans right-of-way associated with the development proposed under the NADP shall adhere to the conditions and requirements of Caltrans statewide NPDES Permit CAS #000003, Order #99-06-DWQ and NPDES General Permit CAS #000002, Order #99-08-DWQ, and shall incorporate Best Management Practices described in Section 4.4 of the Storm Water Management Plan which implements the statewide NPDES permit, as such requirements specifically apply to the proposed improvements. In general, this would include the preparation and implementation of a Storm Water Pollution Prevention Plan and Best Management Practices for construction and post-construction conditions for each such project.

Impact AQ-7: Construction emissions associated with new development and renovation of existing facilities would result in potentially unhealthy air pollutant concentrations.

Mitigation Measure AQ-7a: NASA and its partners would install air pollution devices, for example, particulate traps and oxidation catalysts, on construction equipment to the extent that they are technically feasible.

Mitigation Measure AQ-7b: NASA and its partners would develop and implement a Construction Emissions Mitigation Plan (CEMP) to ensure that the project would comply with the Federal Clean Air Act and further reduce emissions. The plan would include measures and procedures, sufficiently defined to ensure a reduction of nitrogen oxides, PM10, and diesel particulate matter.

The CEMP would be developed in consultation with EPA and BAAQMD. The CEMP would be evaluated by NASA and its partners on an annual basis to schedule construction ensuring that emissions of ozone precursors associated with project construction and operation would not exceed 91 tonnes (100 tons) per year and update measures to include new rules or regulations. NASA and its partners would consult with the BAAQMD on an annual basis during project construction to determine if additional air quality mitigations to reduce the project's air quality impact are warranted, and to take such additional air quality mitigation as is appropriate and reasonable, and in an expeditious manner.

A CEMP coordinator, who would also act as a "Disturbance Coordinator" would be responsible for ensuring that measures included in the CEMP are implemented. This would be done through field inspections, records review, and investigations of complaints.

At a minimum, the CEMP would include the following measures to reduce emissions from construction activities:

- Require that all equipment is properly maintained at all times. All construction equipment working on site would be required to include maintenance records indicating that all equipment is tuned to engine

manufacturer's specifications in accordance with the time frame recommended by the manufacturer.

- All construction equipment would be prohibited from idling more than 5 minutes.
- Tampering with equipment to increase horsepower would be strictly prohibited.
- Include particulate traps, oxidation catalysts and other suitable control devices on all construction equipment used at the site.
- Diesel fuel having a sulfur content of 15 ppm or less, or other suitable alternative diesel fuel, would be used unless such fuel cannot be reasonably procured in the market area.
- The CEMP would also ensure that construction-related trips are minimized through appropriate policies and implementation measures.
- The CEMP would address the feasibility on a biannual basis of requiring the use of reformulated or alternative diesel fuels.
- The CEMP Coordinator (or Environmental Coordinator) would prohibit the use of equipment that visibly produces substantially higher emissions than other typical equipment of similar size.
- The staging of three or more pieces of construction equipment near or just upwind from sensitive receptors such as residences or daycare uses would be prohibited.

Mitigation Measure AQ7c: The CEMP would address the feasibility of requiring or encouraging the use of "Cleaner" (Lower Emissions) construction equipment on an annual basis. For larger construction projects (i.e., projects greater than 9,290 square meters (100,000 square feet)), a percentage of the equipment would be required to be 1996 or newer. This would be determined as follows:

- If equipment is leased by the contractor, then the percentage of 1996 or newer equipment would be maximized so that the total cost of leasing equipment would not exceed 110 percent of the average available cost for leased equipment.
- If equipment is owned by the Contractor, then the CEMP shall identify the minimum percentage of total horsepower for 1996 or newer equipment that should be used in construction. For the first year of construction, it shall be considered possible that 1996 or newer equipment shall makeup a minimum of 75 percent of the total horsepower, unless NASA and its partners can show the BAAQMD that it is not reasonable.

Impact INFRA-1: Portions of the sanitary sewer conveyance system between Ames Research Center and the SWPCP are already flowing at or near maximum capacity. Under Alternatives 2 through 5, discharge from the development proposed under the NADP would contribute to the existing capacity problems.

Mitigation Measure INFRA-1: NASA would cooperate with the City of Sunnyvale in determining the cumulative impact of existing and proposed development on the sanitary sewer conveyance system between Ames Research Center and the SWPCP. NASA and its partners would contribute their fair share toward construction of conveyance pipes and supporting infrastructure which are determined to be necessary to mitigate the cumulative impact of existing and proposed development.

Impact INFRA-3: Under Alternatives 2, 4 and 5, discharge from Ames Research Center to the PARWQCP would increase. The plant has sufficient capacity to treat the additional flow. However, the flow for all alternatives would exceed what is specified in the 1993 agreement (which was renewed in 1999) between Ames Research Center and the Plant. NASA does not have a current flow capacity agreement with the City of Mountain View or the

PARWQCP. However, NASA has a current wastewater discharge permit with PARWQCP.

Mitigation Measure INFRA-3: The 1993 agreement for flow capacity between the PARWQCP and Ames Research Center and between Mountain View and Ames Research Center would be amended to address the additional flow expected from the project before commencing any development. The agreement with Mountain View would include trigger amounts and a formula for the fair share as identified in INFRA-2.

Impact SERV-1: Under Alternatives 2, 4, 5, and Mitigated Alternative 5, housing development in the Bay View Area would result in an increase in elementary school students that would impact the Mountain View-Whisman School District.

Mitigation Measure SERV-1: The NADP housing developers would pay the standard Developer Impact Fees to the Mountain View-Whisman School District.

Impact HAZ-2: Proposed childcare facilities in the Bay View area could be located near the Mountain View Industrial Park, where some businesses handle hazardous materials. Spills or releases at these businesses could expose children to hazardous air pollution. This would be a significant impact.

Mitigation Measure HAZ-2: In Alternatives 2, 4 and 5, NASA or its partners would locate childcare facilities at least 305 meters (1,000 feet) from the industrial area of Mountain View, which would limit the area in which industries handling hazardous materials would be prohibited. Mitigated Alternative 5 would locate childcare facilities at least 402 meters (1,320 feet) from the industrial area of Mountain View in accordance with City of Mountain View policy.

Impact GEO-4: Detailed geotechnical studies have yet to be completed for most of the potential building sites at Ames Research Center. While

preliminary studies indicate that it would be possible to safely construct the types of buildings foreseen for all planning areas under any of the alternatives, there may be specific geotechnical hazards on individual sites that require mitigation when construction occurs.

Mitigation Measure GEO-4: Prior to construction of individual facilities, NASA or its partners would conduct detailed geotechnical investigations of all proposed building sites, and would incorporate the engineering recommendations of these studies into building design and construction.

Impact BIO-1: Construction vehicles could inadvertently injure or kill individuals of special-status species or migratory birds. Because of the rarity of salt marsh harvest mouse (an endangered species), in particular, construction-related mortality could be a significant impact.

Mitigation Measure BIO-1: To minimize the potential for injury or death caused by construction vehicles to western burrowing owls or migratory birds in all four planning areas and to salt marsh harvest mice in the Bay View area, the following components would be implemented:

- As much as possible, construction traffic would not be routed on roads adjacent to habitats where these special-status species occur and would be prohibited from using roads when habitat considerations require it.
- Occupied or potential habitat for these species near established routes would be marked as off-limits to construction vehicles.
- In the Bay View area, if construction vehicles must travel on roads within approximately 30 meters (100 feet) of occupied or potential habitat, drift fencing would be erected to prevent salt marsh harvest mice from crossing these roads. The drift fencing would be placed so that harvest mice retain access to adjacent upland habitats for use as refugia during high water events.

- All drivers of construction vehicles would be informed of the established vehicle routes and made aware of the importance of avoiding occupied and potential habitat for western burrowing owls and salt marsh harvest mice.
- Construction activity would not be allowed to disturb nesting migratory birds.

Impact BIO-2: There could be indirect adverse impacts if runoff from construction sites entered adjacent wetlands, decreasing water quality in these wetland communities.

Mitigation Measure BIO-2b: A wetland enhancement plan would be developed for the restoration of functions and values of aquatic habitats in and adjacent to the Bay View area and outside of development area. This plan would include provisions to improve the quality of existing wetlands in the Bay View area through removal of invasive non-native plants such as periwinkle and perennial pepperweed. This enhancement plan would be developed in coordination with, and would be approved by, the US Army Corps of Engineers and the Regional Water Quality Control Board prior to implementation of the proposed action.

All construction near or adjacent to wetlands would implement standard Best Management Practices to minimize runoff into these sensitive areas. Implementing grading and construction during the driest months of the year (July–October) would reduce the potential for siltation and runoff into surrounding habitats.

Impact BIO-4: New development at Ames Research Center would increase the number of employees on-site, with a corresponding increase in the potential for people to release unwanted cats and establish unauthorized feeding stations for feral cats. The populations of feral cats and other predatory species would increase, and with it predation on native species, especially ground-nesting and special-status birds.

Mitigation Measure BIO-4: NASA and its partners would institute the following programs and policies to limit increases in predator populations:

- Prohibit employees from feeding wildlife, including cats.
- Institute and enforce a no pets policy in new housing.
- Install trash containers that cannot be opened by predator species.
- Augment the existing non-native predator control program, which includes humane trapping and removal of feral cats and other non-native predators.
- Conduct a public education program about the impacts caused by non-native predators and the need to refrain from feeding feral cats and other wildlife.
- A regular construction cleanup crew would be designated to ensure that construction debris and trash do not attract predators or scavengers.

Impact BIO-5: Building-roosting bats may be disturbed by the demolition and renovation of existing buildings at Ames Research Center.

Mitigation Measure BIO-5: To avoid impacts to roosting bats, a preconstruction survey of buildings to be demolished or renovated would be conducted by a qualified wildlife biologist in accordance with recommendations of the California Department of Fish and Game. If special status roosting bats are found, CDFG would be consulted. An avoidance or mitigation plan would be developed and implemented. Avoidance measures could include construction outside of hibernation and maternal roosting time periods (winter), excluding bats from the buildings after they have left the roost to forage at night by closing entrances, and the construction of bat boxes to accommodate displaced bats. If bat boxes are used, NASA would monitor their success.

Impact BIO-7: Lighting along roads and buildings in proposed development areas in the Bay View area may impact wildlife species by disrupting their movements, breeding, or other behaviors.

Mitigation Measure BIO-7: NASA is conducting a lighting study to determine baseline levels. When feasible, nighttime lighting would be excluded in new development adjacent to high-quality wildlife habitat in the North of Bay View area. The Bay View housing would not be allowed to cause a net increase in lighting in the areas north or east of Bay View. The impacts of necessary lighting would be minimized by using low-glare light sources (e.g., low pressure sodium lighting) mounted on short poles and directed away from native habitats. In addition, light amplification to nearby sensitive areas would be eliminated through directional lighting with baffles, non-reflective tinting on windows, and other mechanisms.

Impact BIO-10: While NASA has taken steps to avoid most potential impacts to nesting habitat, new development would result in the loss of owl nesting habitat in NRP Parcels 7 and 8. In addition, development would cause the loss of some foraging habitat, especially in the Bay View area.

Mitigation Measure BIO-10: NASA and its partners would:

- Establish a burrowing owl preserve in the NRP area which would prevent impacts to owls currently nesting within the future preserve area, and mitigate impacts to owls that might be disturbed by development on NRP Parcels 7 and 8. Restoration, including the removal of concrete, asphalt and other structures, and enhancement of the preserve in the NRP area sufficient to offset development impacts would occur prior to that development.
- Design landscaping in developed areas with low growing native vegetation to enhance owl use.

- Minimize the development footprint to the extent possible, and locate new development adjacent to existing development to minimize habitat fragmentation.
- Minimize construction impacts on nesting and foraging habitat by restricting the area available for circulation and staging of equipment.
- Manage other grassland areas at Ames Research Center to support owls and their prey.

Impact BIO-11: There could be short-term disturbances to existing burrows if construction occurred too close to the burrows. There could also be long-term disturbances caused by increased intrusion into nesting areas by new residents, employees, and visitors and their pets.

Mitigation Measure BIO-11b: In order to prevent long-term disturbances from increases in population associated with implementation of the NADP, NASA and its partners would:

- Fence off owl habitat with attractive fencing and low, native shrubs.
- Design paths around the perimeter of owl habitat to allow people to see the owls without disturbing them.
- Prohibit walkers, bikers, and dogs from moving through the habitat areas.
- Use signage to educate people about the owls and their sensitivities.
- Monitor habitat areas after construction, and implement further protective measures as needed.
- Restrict construction of roads, trails, pathways, and other development from occurring within designated burrowing owl preserves.

Impact BIO-15: Proposed new development could increase the population of predators by planting new trees and installing light poles that provide perches

for birds of prey, by creating habitat for rodents, and by increasing the population of people, some of whom may feed feral cats.

Mitigation Measure BIO-15: In order to prevent increased predation, NASA would enforce Mitigation Measure BIO-4, above. In addition, NASA and its partners would:

- Continue on-going efforts to control non-native predators in conjunction with US Fish and Wildlife.
- Limit tree planting along roads or buildings adjacent to owl and other wildlife habitat areas to minimize the increase in available perches for avian predators, and modify other potential perches structurally to discourage predators.
- Minimize outdoor lighting posts near burrowing owl and other wildlife habitat to reduce new perches for avian predators. Where lighting is needed for safety reasons, install devices to discourage birds from perching.
- Trees in Bay View adjacent to the Western Dikes Marsh would be from the USFWS approved list.
- Compensate for increases in predation by eliminating predator perches along and within the boundaries of the Western Diked Marsh, Eastern Diked Marsh and Storm Water Retention Pond.
    - Place roll wire atop all fencing surrounding the eastern and western diked marshes and the storm water retention pond.
    - Place anti-perch devices on and surrounding the Plant Engineering facilities at the northwest corner of ARC property.
    - If feasible, remove all landscape features within these areas that provide perches for avian predators.
- If possible, avoid the use of rip rap on slopes resulting from fill of the Bay View housing area. If rip rap must be used, it must be small diameter materials that would not create habitat for rodents.

— Avoid placing rip rap on existing marsh vegetation.

Impact BIO-18: There could be indirect adverse impacts if runoff from construction sites entered the existing storm drain system and the Storm Water Retention Pond.

Mitigation Measure BIO-18: Potentially contaminated runoff would be managed using stormwater BMPs. Swales would be constructed adjacent to wetlands in upland areas to intercept and filter any runoff before it reaches the wetland. Construction of swales would be permitted within the buffer zone around wetlands, but not within the wetlands themselves.

Impact BIO-19: There could be indirect adverse impacts if runoff from construction sites entered adjacent wetlands, decreasing water quality in these wetland communities.

Mitigation Measure BIO-19: To minimize impacts on wetlands, construction would be avoided in the jurisdictional wetlands along the northern boundary of the Bay View area and within the buffer zone of these wetlands. Fill activities and other disturbances would be avoided in jurisdictional wetlands elsewhere in the Eastside/Airfield area.

Impact NOISE-1: Buildout of the NADP would potentially expose new land uses in the Bay View, NRP, and Ames Campus areas to existing noise sources at levels exceeding those considered normally acceptable for the intended use. Buildings 19 and 20, which are proposed for housing in Mitigated Alternative 5, would be in the 70 to 75 dB and 65 to 70 dB noise exposure areas, respectively.

Mitigation Measure NOISE-1a: For development on NRP Parcels 2, 4, 9, 10, 11, 12, 12a and 16, and the Ames Campus, noise mitigation measures, including site planning to protect noise sensitive outdoor activity areas and building sound insulation treatments to protect noise sensitive indoor spaces, would be included in project design and development. Buildings

would be designed to provide an appropriate Noise Level Reduction (NLR) depending upon the designated uses of the sensitive spaces.

Impact AES-1: The lack of design guidelines, height limits, and setback requirements for the Bay View, Ames Campus, and Eastside/Airfield areas could allow future development to create too stark a contrast in terms of height, density, or architectural style.

Mitigation Measure AES-1: NASA and its partners would develop design guidelines for the Bay View, Ames Campus and Eastside/Airfield areas in order to ensure that new buildings would stylistically complement the existing buildings in the Ames Campus and Eastside/Airfield. Design guidelines for the Bay View area would include setback requirements for Stevens Creek and Western Diked Marsh, and would ensure harmonious design.

Impact AES-2: The allowed four- to six -story height of proposed student apartments on NRP parcel 6 could conflict with the prevailing low heights in the adjacent Berry Court Military Housing area.

Impact AES-5: New development in the Bay View area could block views from the Stevens Creek Trail of the historic hangars and the San Francisco Bay.

Mitigation Measure AES-5: NASA and its partners would use site layout to preserve view corridors from the Stevens Creek Trail through new development in Bay View to the historic hangars and to the San Francisco Bay.

Impact REC-1: Alternatives 2 through 4 would not supply enough new recreational space to meet demands generated by new employees and residents.

Mitigation Measure REC-1: NASA and/or its partners would develop additional active recreation areas in development areas on- the ARC site to meet recreation demands generated by new employees and residents.

Impact CUL-2: Rehabilitating existing historic structures could significantly impact their integrity.

Mitigation Measure CUL-2a: Any project that involves the rehabilitation of contributing buildings within the Shenandoah Plaza Historic District would follow the Historic Resource Protection Plan. Appropriate landscaping would be used to avoid impact to historic buildings. The Historic Resources Protection Plan includes the guidelines for Rehabilitation of Historic structures prepared for NASA by Architectural Resources Group, and the Reuse Guideline for Hangar 1, prepared by Page and Turnbull, which comply with the Secretary of the Interior's Standards. New additions would be located on secondary facades. Restoring facades that have been previously altered would be considered as an alternative.

Mitigation Measure CUL-2b: The State Historical Building Code would be used when planning for structural stability or the installation of protective or code required mechanical systems or access.

Mitigation Measure CUL-2c: Design guidelines for the historic structures would be modified to include:

- Replacement glass would be with like kind.
- No change of exterior material would occur.
- Installation of utilities would not affect historic character defining features.
- New materials would not affect the historic integrity of original materials.
- Ground disturbing activities would match materials in-kind.

Impact SOCIO-1: Alternatives 2 through 5 would generate one percent or more of the new households in the Housing Impact Area between 2000 and 2015 and contribute to the regional jobs-housing imbalance.

Mitigation Measure SOCIO-1a: NASA will continue to attemptto acquire the rights to occupy as much of the Department of Defense (DOD) housing located at Moffett Field as possible to bolster the projected supply provided under each of the alternatives.

Mitigation Measure SOCIO-1b: In the Mitigated Alternative 5, NASA would require the provision of 1,120 townhome and apartment units in the Bay View area, and 810 student apartment and dormitory units in the NRP area. If this level of housing development could not be achieved, NASA would commensurately scale back the employment and student generating components of the project.

The provision of these units could have the potential to create secondary impacts in the areas of traffic, air quality, infrastructure, services, noise and fiscal impact. These impacts are discussed in detail in Chapter 5. The analysis of these potential impacts concludes that there would be no significant impacts beyond those disclosed in the DPEIS. In fact, traffic impacts would be lessened. Infrastructure, service, and fiscal impacts would be mitigated through the payment of fair share contributions to sewer infrastructure and through Developer Impact Fees to offset impacts to schools, libraries and recreational programs in the City of Mountain View. Although residential uses in Building 20 would be within a 70dB noise exposure contour, this is considered conditionally acceptable by HUD and California Planning Guidelines, although not by Santa Clara County. Building 19 would be in a noise exposure area of 70 to 75 dB, which is above California Planning Guidelines conditionally acceptable levels, but is still conditionally acceptable to HUD. These noise impacts would be mitigated to less than significant levels.

Mitigation Measure SOCIO-1c: NASA would continue to evaluate the possibility of constructing housing above retail proposed in the NRP area.

Mitigation Measure SOCIO-1d: NASA would require at least 10 percent of the on-site housing to be affordable to low income households.

These four mitigation measures would not completely mitigate the impact. The Bay Area, and Santa Clara County in particular, has one of the most competitive housing markets in the nation. Housing demand far outstrips supply throughout the region, and the additional jobs generated by the NADP would contribute to the regional housing demand. Even with mitigation, the alternatives would generate workers who would not be housed on-site who would represent over one percent of the predicted new households in the Housing Impact Area through 2015. Hence, this impact would be significant and unavoidable.

Impact SOCIO-2: Alternative 3 would generate a net negative fiscal impact on the City of Mountain View, due in particular to increased demands on recreational and library facilities.

Mitigation Measure SOCIO-2: NASA, in collaboration with its Partners, would provide on-site library and recreation facilities. These would include community rooms within the residential portions of the project, an on-site fitness center, and reading rooms and libraries as part of the University-related uses.

Impact SOCIO-3: Under Alternatives 2, 4, 5, and Mitigated Alternative 5, increases in costs generated by ARC high-school students could exceed 0.5 percent of the Mountain View-Los Altos Union High School District annual revenue limit.

Mitigation Measure SOCIO-3: NASA and the Mountain View-Los Altos Union High School District will negotiate an agreement whereby in any given year, should the Mountain View-Los Altos Union High School

District's per student operating revenues decrease below a pre-determined baseline as a direct result of enrollment generated by the NADP, NASA or its partners will compensate the District for the shortfall associated with these students. The baseline would be set to the District's per student operating revenues in the year prior to when students residing at ARC first begin attending classes in the District, and would be adjusted for cost of living and inflationary changes over time.

TABLE 0-1 **SUMMARY OF IMPACTS AND MITIGATION MEASURES**

Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
PUBLIC POLICY				
There are no significant impacts or mitigation measures for public policy.				
LAND USE				
There are no significant impacts or mitigation measures for land use.				
TRAFFIC				
CIR-1: Implementation of the proposed project would increase vehicle trips and traffic congestion on segments of Highways 101, 85, and 237 in the immediate vicinity of the Ames Campus, as well as on highway segments outside the local study area. On all nearby segments projected to operate at LOS F, the project would add more than one percent of capacity in at least one direction during the AM and/or PM peak hour. The project is also expected to add more than one percent of capacity to numerous highway segments outside the immediate vicinity of the project in Santa Clara County, as well as on several segments in adjacent counties.	2 through 5, and Mitigated Alternative 5	S	CIR-1: As part of the NADP, NASA and its partners would implement an aggressive Transportation Demand Management (TDM) program designed to reduce trip generation by a total of at least 22 percent. AVR goals are set for each phase of the TDM plan. Development will not proceed to the next phase until the previous phase's goal has been met. In addition, on-site housing would also help to reduce vehicle trip generation to external streets and freeways by internalizing trips to on-site employment centers and amenities. To completely mitigate the highway impacts of the proposed project under any of the development alternatives, each highway segment would have to be widened to provide an additional travel lane in at least one direction or other capacity improvements would have to be made. In many cases, widening is infeasible due to right-of-way constraints and the proximity of existing building structures and development. Immediately adjacent to the project site, for example, Highway 101 could not be widened because of the proximity of Manila Drive and the VTA light rail line. In addition, large-scale freeway widening projects are beyond the scope of a single project and could only garner a relatively small fair-share contribution towards the improvement. Therefore, despite the substantial trip reductions from implementation of the TDM program, the increase in vehicle trips and congestion on the highway system associated with implementation of the NADP would be a significant, unavoidable impact. NASA will work with VTA and Caltrans to consider other mitigations.	SU

LTS = Less Than Significant S = Significant SU = Significant Unavoidable Impact

Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
CIR-2: The proposed project would increase vehicle trips and traffic congestion at the Moffett Boulevard/Central Expressway and Ellis Street/Manila Drive intersections.	2 through 4	S	CIR-2a: *Moffett Boulevard/Central Expressway*. The improvement required to mitigate this impact is the addition of a separate right turn lane from southbound Moffett Boulevard to westbound Central Expressway. This measure would require right-of-way acquisition to implement. The additional lane would improve operations to LOS E during the PM peak hour and would fully mitigate the impact.	LTS
			CIR-2b: *Intersection of Ellis Street/Manila Drive.* Development under the NADP would include the following improvements to achieve acceptable operations and minimize queuing at this intersection: — Install a traffic signal. — Provide the following lane configurations: " *Northbound (from Highway 101)*: two through lanes and one right-turn lane. " *Southbound (from NRP)*: one left-turn lane and two through lanes. " *Westbound (from the LRT station)*: one left-turn lane and one shared left-turn/right-turn lane. This measure would provide LOS C operations during the PM peak hour.	LTS

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Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
CIR-3: The proposed project would increase vehicle trips and traffic congestion at the intersections of Moffett Boulevard-Clark Memorial Drive/R.T. Jones Road.	2 through 5, and Mitigated Alternative 5	S	CIR-3: *Intersection of Moffett Boulevard/Clark Memorial Drive/R.T. Jones Road.* Development under the NADP would include the following improvements to achieve acceptable operations and minimize queuing at this intersection: — Installation of a traffic signal. — Provision of the following lane configurations: " *Northbound (from Space Camp/base housing)*: one left-turn lane, one shared through/right-turn lane. " *Southbound (from Bay View)*: one left-turn lane, one through lane, and one "free" right-turn lane (i.e., the right-turn movement would not be controlled by the signal and would require a third westbound receiving lane on Moffett Boulevard). " *Westbound (from Clark Memorial Drive)*: one left-turn lane, two through lanes, and one right-turn lane. " *Eastbound (from Highway 101)*: two left-turn lanes, one through lane, and one shared through/right-turn lane. This measure would provide LOS C or D operations or better during all periods under all alternatives.	LTS
CIR-4: The proposed project would increase vehicle trips and traffic congestion at the following intersections Moffett Boulevard/Highway 101 SB ramps Moffett Boulevard/Highway 101 NB ramps Central Expressway/Mary Avenue.	4	S	CIR-4a: *Moffett Boulevard/Highway 101 SB ramps*. Mitigation of this impact for Alternative 4 would require the addition of a second westbound left-turn lane to southbound Highway 101. The current plans for the interchange modification currently only include a single westbound left-turn lane. This improvement would provide LOS B operations during the PM peak hour. Because of cost, political, and ownership considerations, this mitigation measure is not feasible. Thus this impact would remain significant and unavoidable.	SU

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Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
			CIR-4b: *Moffett Boulevard/Highway 101 NB ramps*. Mitigation for Alternative 4 would require the addition of a second northbound right-turn lane on the off-ramp from U.S. 101. The current plans for the interchange modification currently only include a single northbound right-turn lane towards the project site. This improvement would provide LOS C operations during the AM peak hour. Because of cost, political, and ownership considerations, this mitigation measure is not feasible. Thus this impact would remain significant and unavoidable.	SU
			CIR-4c: *Central Expressway/Mary Avenue*. Mitigation for Alternative 4 would require the addition of a second southbound right-turn lane to westbound Central Expressway. This improvement would provide LOS E operations during the AM peak hour. However, adjacent existing development and a sidewalk would preclude widening of the roadway. Because of these right-of-way constraints, this mitigation measure is not considered feasible. Thus this impact would remain significant and unavoidable.	SU
CIR-5: Alternatives 2 and 4 would increase vehicle trips and traffic congestion at the following intersections: Moffett Boulevard/Middlefield Road SR 237 EB Ramps/Mathilda Avenue SR 237 WB Ramps/Mathilda Avenue Moffett Park Drive/Mathilda Avenue	2 and 4	S	CIR-5a: *Moffett Boulevard/Middlefield Road.* To fully mitigate the impacts under both the AM and PM peak hours at this location, a separate right-turn lane from Middlefield Road to northbound Moffett Boulevard would be required. In addition, an overlap signal phase concurrent with the left-turn phase for southbound Moffett Boulevard to eastbound Middlefield Road would be required. These improvements would provide LOS D operations during both peak hours and would fully mitigate the projected impacts. However, a preliminary field review indicates that this improvement is not feasible due to the proximity of existing development and a sidewalk. Thus, the impact is expected to remain significant and unavoidable.	SU

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Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
			CIR-5b: *SR 237 EB Ramps/Mathilda Avenue*. The addition of any lane capacity at this location would require: complete re-construction of the Highway 101 overpass to widen the road for additional through lanes, non-standard lane configurations such as four left-turn lanes, or provision of another street crossing over SR 237 (e.g., the Mary Avenue overcrossing). Because of cost, political, and ownership considerations, this mitigation measure is not feasible. Thus this impact would remain significant and unavoidable.	SU
			CIR-5c: *SR 237 WB Ramps/Mathilda Avenue*. Mitigation of this impact would require the addition of a separate southbound right-turn lane from Mathilda Avenue to the on-ramp to westbound SR 237 to provide four exclusive southbound through lanes. Because of cost, political, and ownership considerations, this mitigation measure is not feasible. Thus this impact would remain significant and unavoidable.	SU
			CIR-5d: *Moffett Park Drive/Mathilda Avenue.* Mitigation of this impact would require the addition of a second southbound right-turn lane from Moffett Park Drive to westbound Mathilda Avenue towards downtown Sunnyvale. This lane would be in addition to the existing right-turn lane from Moffett Park Drive to westbound Highway 237, but would likely require modification of this already short-radius curve. Because of cost, political, and ownership considerations, this mitigation measure is not feasible. Thus, this impact would remain significant and unavoidable.	SU
CIR-6: The increased level of vehicle and bicycle traffic through the Ellis Street underpass at Highway 101 resulting from the project would increase hazards for bicyclists, who share the standard travel lanes in this location.	2 through 5, and Mitigated Alternative 5	S	CIR-6: Development under the NADP would modify the Ellis Street underpass to better accommodate bicyclists.	LTS (unless unable to implement)

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Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
CIR-7: Construction activity associated with the proposed improvements to facilities within Caltrans right-of-way has the potential to introduce pollutant laden runoff into the storm drain system.	2 through 5, and Mitigated Alternative 5	S	CIR-7: Improvements to facilities within Caltrans right-of-way associated with the development proposed under the NADP shall adhere to the conditions and requirements of Caltrans statewide NPDES Permit CAS #000003, Order #99-06-DWQ and NPDES General Permit CAS #000002, Order #99-08-DWQ, and shall incorporate Best Management Practices described in Section 4.4 of the Storm Water Management Plan which implements the statewide NPDES permit, as such requirements specifically apply to the proposed improvements. In general, this would include the preparation and implementation of a Storm Water Pollution Prevention Plan and Best Management Practices for construction and post-construction conditions for each such project.	LTS
AIR QUALITY				
AQ-1: Build out of the NASA Ames Development Plan would result in population and vehicle uses projections that are inconsistent with regional air quality planning, and in emissions of air pollutants from automobiles and construction equipment which would exceed significance thresholds established by the BAAQMD.	2 through 5, and Mitigated Alternative 5	S	AQ-1: The NADP includes a proposed TDM plan to reduce automobile trips from existing and planned uses. Even with the substantial reductions in vehicle trips projected in the TDM plan, emissions would remain above BAAQMD significance thresholds. This impact is significant and unavoidable.	SU
AQ-2: Without limits on the timing of construction, emissions of ozone precursors associated with combined construction and operation of the project could exceed 90,719 kilograms (100 tons) in any given year in which construction occurs. This would exceed the *de minimus* levels set forth in the Federal General Conformity Regulation and trigger the need for an additional conformity determination beyond the one proposed for carbon monoxide.	2 through 5, and Mitigated Alternative 5	S	AQ-2: NASA and its partners would schedule construction to ensure that annual emissions of ozone precursors associated with project construction and operation do not exceed a cumulative total of 100 tons per year. This would apply over all years of project construction and operation or until an applicable State Implementation Plan that includes the project emissions is approved by EPA. Implementation of this mitigation is mandatory to comply with the Federal Clean Air Act.	LTS

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Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
AQ-3: Proposed laboratories and disaster training facilities would be a potential source of air pollutant emissions, including emissions of toxic air contaminants.	2 through 5, and Mitigated Alternative 5	S	AQ-3: Prior to the issue of occupancy permits, operators of laboratories and disaster training facilities would be required to consult with the BAAQMD regarding possible permit requirements and emissions reduction equipment and to comply with BAAQMD's requirements.	LTS
AQ-4: Any long-term residential uses located over high concentrations of the Regional Plume would potentially be exposed to levels of air contaminants that present an adverse health risk.	2 through 5, and Mitigated Alternative 5	S	AQ-4: Long-term residential uses would be avoided at areas located over high concentration zones of the Regional Plume in accordance with the Human Health Risk Assessment (HHRA) and EIMP.	LTS
AQ-5: New proposed land uses under the NADP would be exposed to elevated levels of toxic air contaminants associated with the Regional Plume. This exposure could present a health risk.	2 through 5, and Mitigated Alternative 5	S	AQ-5: NASA would review all planned uses in light of the findings of the HHRA to ensure that planned uses would not create unacceptable public health risks. Proposed uses would be moved if unacceptable risks which could not be mitigated to an acceptable level were found.	LTS
AQ-6: Construction emissions of PM_{10} associated with new development and renovation of existing facilities would result in potentially unhealthy air pollutant concentrations.	2 through 5, and Mitigated Alternative 5	S	AQ-6a: Measures to control dust generation would reduce this impact associated with PM_{10} to a level of less-than-significant. The following measures, including all control measures recommended by the BAAQMD, would be incorporated into construction contract specifications and enforced by NASA. These measures include the following provisions: — Use reclaimed water on all active construction areas at least twice daily and more often during windy periods. Watering is the single-most effective measure to control dust emissions from construction sites. Proper watering could reduce dust emissions by over 75 percent. — Cover all hauling trucks or maintain at least 0.6 meters (2 feet) of freeboard. Dust-proof chutes would be used as appropriate to load debris onto trucks during any demolition.	LTS

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Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
			— Pave, apply reclaimed water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites. — Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas and sweep streets daily (with water sweepers) if visible soil material is deposited onto the adjacent roads. — Hydro seed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas that are inactive for 10 days or more). — Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles. — Limit traffic speeds on any unpaved roads to 25 kilometers per hour (15 mph). — Install sandbags or other erosion control measures to prevent silt runoff to public roadways. — Replant vegetation in disturbed areas as quickly as possible. — Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site. — If necessary, install windbreaks, or plant trees/vegetative windbreaks at the windward side(s) of construction areas. — Suspend excavation and grading activity when winds (instantaneous gusts) exceed 40 kilometers per hour (25 mph) and visible dust emission cannot be prevented from leaving the construction site(s).	

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Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
			— Limit areas subject to disturbance during excavation, grading, and other construction activity at any one time. — Prior to disturbance (or removal) of materials suspected to contain asbestos, lead or other toxic air contaminants, contact the BAAQMD. — NASA would designate an *Environmental Coordinator* responsible for ensuring that mitigation measures to reduce air quality impacts from construction are properly implemented. This person would also be responsible for notifying adjacent land uses of construction activities and schedule.	
			AQ-6b: Measures to reduce emissions of nitrogen oxides and particulate matter from diesel fuel combustion during construction should be evaluated and implemented where reasonable and feasible. The following measures would reduce the impacts from construction fuel combustion: — Properly maintain construction equipment. This measure would reduce emissions of ROG, NOx and PM_{10} by about 5 percent. — Evaluate the use of available alternative diesel fuels and where reasonable and feasible, use alternative diesel fuels. *The CARB has verified reductions of NOx by almost 15 percent, and particulate matter by almost 63 percent, from use of alternative diesel fuels. However, the use of these fuels may not be appropriate for all diesel equipment*. — Reduce construction traffic trips through TDM policies and implementation measures. — Reduce unnecessary idling of construction equipment and avoid staging equipment near or upwind from sensitive receptors such as on-site residences or daycare uses.	

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Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
			— Where possible, use newer, cleaner burning diesel-fueled construction equipment. The *Environmental Coordinator* would prohibit the use of equipment that visibly produces substantially higher emissions than other typical equipment of similar size.	LTS
AQ-7: Construction emissions associated with new development and renovation of existing facilities would result in potentially unhealthy air pollutant concentrations.	2 through 5, and Mitigated Alternative 5	S	AQ-7a: NASA and its partners would install air pollution devices, for example, particulate traps and oxidation catalysts, on construction equipment to the extent that they are technically feasible. AQ-7b: NASA and its partners would develop and implement a Construction Emissions Mitigation Plan (CEMP) to ensure that the project would comply with the Federal Clean Air Act and further reduce emissions. The plan would include measures and procedures, sufficiently defined to ensure a reduction of nitrogen oxides, PM_{10}, and diesel particulate matter. The CEMP would be developed in consultation with EPA and BAAQMD. The CEMP would be evaluated by NASA and its partners on an annual basis to schedule construction ensuring that emissions of ozone precursors associated with project construction and operation would not exceed 91 tonnes (100 tons) per year and update measures to include new rules or regulations. NASA and its partners would consult with the BAAQMD on an annual basis during project construction to determine if additional air quality mitigations to reduce the project's air quality impact are warranted, and to take such additional air quality mitigation as is appropriate and reasonable, and in an expeditious manner. A CEMP coordinator, who would also act as a "Disturbance Coordinator" would be responsible for ensuring that measures included in the CEMP are implemented. This would be done through field inspections, records review, and investigations of complaints.	LTS

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Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
			At a minimum, the CEMP would include the following measures to reduce emissions from construction activities: — Require that all equipment is properly maintained at all times. All construction equipment working on site would be required to include maintenance records indicating that all equipment is tuned to engine manufacturer's specifications in accordance with the time frame recommended by the manufacturer. — All construction equipment would be prohibited from idling more than 5 minutes. — Tampering with equipment to increase horsepower would be strictly prohibited. — Include particulate traps, oxidation catalysts and other suitable control devices on all construction equipment used at the site. — Diesel fuel having a sulfur content of 15 ppm or less, or other suitable alternative diesel fuel, would be used unless such fuel cannot be reasonably procured in the market area. — The CEMP would also ensure that construction-related trips are minimized through appropriate policies and implementation measures. — The CEMP would address the feasibility on a biannual basis of requiring the use of reformulated or alternative diesel fuels. — The CEMP Coordinator (or Environmental Coordinator) would prohibit the use of equipment that visibly produces substantially higher emissions than other typical equipment of similar size. — The staging of three or more pieces of construction equipment near or just upwind from sensitive receptors such as residences or daycare uses would be prohibited.	LTS

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Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
			AQ7c: The CEMP would address the feasibility of requiring or encouraging the use of "Cleaner" (Lower Emissions) construction equipment on an annual basis. For larger construction projects (i.e. projects greater than 9,290 square meters (100,000 square feet)), a percentage of the equipment would be required to be 1996 or newer. This would be determined as follows: — If equipment is leased by the contractor, then the percentage of 1996 or newer equipment would be maximized so that the total cost of leasing equipment would not exceed 110 percent of the average available cost for leased equipment. — If equipment is owned by the Contractor, then the CEMP shall identify the minimum percentage of total horsepower for 1996 or newer equipment that should be used in construction. For the first year of construction, it shall be considered possible that 1996 or newer equipment shall makeup a minimum of 75 percent of the total horsepower, unless NASA and its partners can show the BAAQMD that it is not reasonable.	
INFRASTRUCTURE				
INFRA-1: Portions of the sanitary sewer conveyance system between Ames Research Center and the SWPCP are already flowing at or near maximum capacity. Under Alternatives 2 through 5, discharge from the development proposed under the NADP would contribute to the existing capacity problems.	2 through 5, and Mitigated Alternative 5	S	INFRA-1: NASA would cooperate with the City of Sunnyvale in determining the cumulative impact of existing and proposed development on the sanitary sewer conveyance system between Ames Research Center and the SWPCP. NASA and its partners would contribute their fair share toward construction of conveyance pipes and supporting infrastructure which are determined to be necessary to mitigate the cumulative impact of existing and proposed development.	LTS
INFRA-2: Under Alternatives 2, 4 and 5, discharge from the western sanitary sewer system would increase. The capacity of the conveyance system between Ames Research Center and the PARWQCP is not adequate for existing flows.	2, 4 and 5, and Mitigated Alternative 5	S	INFRA-2: New conveyance piping would be installed between the area served by the existing lift station at the Mountain View Golf Course and the PARWQCP, with sufficient capacity to accommodate the total expected flow. This would require the installation of roughly 5,486 meters (18,000 lineal feet) of pipe. Development under the NADP would contribute its fair share to the solution to this existing regional problem.	LTS

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INFRA-3: Under Alternatives 2, 4 and 5, discharge from Ames Research Center to the PARWQCP would increase. The plant has sufficient capacity to treat the additional flow. However, the flow for all alternatives would exceed what is specified in the 1993 agreement (which was renewed in 1999) between Ames Research Center and the Plant. NASA does not have a current flow capacity agreement with the City of Mountain View or the PARWQCP. However, NASA has a current wastewater discharge permit with PARWCP.	2, 4 and 5, and Mitigated Alternative 5	S	INFRA-3: The 1993 agreement for flow capacity between the PARWQCP and Ames Research Center and between Mountain View and Ames Research Center would be amended to address the additional flow expected from the project before commencing any development. The agreement with Mountain View would include trigger amounts and a formula for the fair share as identified in INFRA-2.	LTS
SERVICES				
SERV-1: Under Alternatives 2, 4 and 5, and Mitigated Alternative 5, housing development in the Bay View Area would result in an increase in elementary school students that would impact the Mountain View-Whisman School District.	2, 4 and 5, and Mitigated Alternative 5	S	SERV-1: The NADP housing developers would pay the standard Developer Impact Fees to the Mountain View-Whisman School District.	LTS

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HAZARDOUS MATERIALS				
HAZ-1: New construction and demolition required to implement the NADP would establish new land uses and could expose the public or uncontaminated soil or water to existing site contamination.	2 through 5, and Mitigated Alternative 5	S	HAZ-1: NASA's development partners would work with the Remediation Project Manager within the Office of Environmental Services during site planning and would implement the guidelines and recommendations in the Environmental Issues Management Plan (EIMP) to ensure that none of the proposed construction, demolition, and infrastructure improvement projects would expose personnel to unacceptable levels of contaminated soil or groundwater. Where the Remediation Project Manager determined that there would be a possible risk of exposure to people or clean soil or groundwater, the proposed design would be altered to prevent such exposure if feasible. If it were not feasible to avoid exposure, protective measures would be undertaken to minimize the risk of exposure as described in the EIMP.	LTS
HAZ-2: Proposed childcare facilities in the Bay View area could be located near the Mountain View Industrial Park, where some businesses handle hazardous materials. Spills or releases at these businesses could expose children to hazardous air pollution.	2, 4 and 5, and Mitigated Alternative 5	S	HAZ-2: In Alternative 2 and 4, NASA or its partners would locate childcare facilities at least 305 meters (1,000 feet) from the industrial area of Mountain View, which would limit the area in which industries handling hazardous materials would be prohibited. Mitigated Alternative 5 would locate childcare facilities at least 402 meters (1,320 feet) from the industrial area of Mountain View in accordance with City of Mountain View policy.	LTS

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GEOLOGY				
GEO-1: Many of the existing buildings that would be rehabilitated and reused do not meet current seismic safety standards.	2 through 5, and Mitigated Alternative 5	S	GEO-1: All rehabilitation of historic structures within the Shenandoah Plaza Historic District would follow the Guidelines for the Rehabilitation of Historic Structures developed by the Architectural Resources Group for NASA and within the Ames Campus would follow the Secretary of the Interior Guidelines for the rehabilitation of Historic Structures in order to maximize seismic safety while minimizing effects on the integrity of any structure on or eligible for the National Register of Historic Places.	LTS
GEO-2: As is the case throughout the San Francisco Bay Area, new buildings, as well as the employees, residents, and visitors that use them, would be exposed to seismic hazards.	2 through 5, and Mitigated Alternative 5	S	GEO-2: All new buildings at Ames Research Center would be designed to meet the current Uniform Building Code regulations for seismic safety.	LTS
GEO-3: As is the case throughout the Santa Clara Valley, new buildings could be exposed to structural hazards from ground subsidence. Also, because almost all of Ames Research Center sits on silty clay soils, new buildings would be exposed to geotechnical hazards such as differential settlement around buildings, and to cracking and heaving. The maximum height of proposed buildings would depend on several factors, including the depth to pockets of soft/medium stiff clayey soil, the thickness of surficial stiff crust, and the thickness of soft/medium stiff clay.	2 through 5, and Mitigated Alternative 5	S	GEO-3: All new construction would be designed based on geotechnical analyses of proposed sites to determine the structural measures necessary to counter the shrink-swell potential of the soil and the risk of structural damage from ground subsidence.	LTS

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GEO-4: Detailed geotechnical studies have yet to be completed for most of the potential building sites at Ames Research Center. While preliminary studies indicate that it would be possible to safely construct the types of buildings foreseen for all planning areas under any of the alternatives, there may be specific geotechnical hazards on individual sites that require mitigation when construction occurs.	2 through 5, and Mitigated Alternative 5	S	GEO-4: Prior to construction of individual facilities, NASA or its partners would conduct detailed geotechnical investigations of all proposed building sites, and would incorporate the engineering recommendations of these studies into building design and construction.	LTS
BIOLOGY				
BIO-1: Construction vehicles could inadvertently injure or kill individuals of special-status species or migratory birds. Because of the rarity of salt marsh harvest mouse (an endangered species), in particular, construction-related mortality could be a significant impact.	2 through 5, and Mitigated Alternative 5	S	BIO-1: To minimize the potential for injury or death caused by construction vehicles to western burrowing owls or migratory birds in all four planning areas and to salt marsh harvest mice in the Bay View area, the following components would be implemented: — As much as possible, construction traffic would not be routed on roads adjacent to habitats where these special-status species occur and would be prohibited from using roads when habitat considerations require it. — Occupied or potential habitat for these species near established routes would be marked as off-limits to construction vehicles. — In the Bay View area, if construction vehicles must travel on roads within approximately 30 meters (100 feet) of occupied or potential habitat, drift fencing would be erected to prevent salt marsh harvest mice from crossing these roads. The drift fencing would be placed so that harvest mice retain access to adjacent upland habitats for use as raftage during high water events.	LTS

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			— All drivers of construction vehicles would be informed of the established vehicle routes and made aware of the importance of avoiding occupied and potential habitat for western burrowing owls and salt marsh harvest mice. — Construction activities would not be allowed to disturb nesting migratory birds.	
BIO-2: There could be indirect adverse impacts if runoff from construction sites entered adjacent wetlands, decreasing water quality in these wetland communities.	2 and 4	S	BIO-2a: To minimize impacts on wetlands, construction would be avoided in the jurisdictional wetlands along the northern boundary of the Bay View area and within 30 meters (100 feet) of these wetlands. Fill activities and other disturbances would be minimized in jurisdictional wetlands elsewhere and in the Eastside/Airfield area. BIO-2b: A wetland enhancement plan would be developed for the restoration of functions and values of aquatic habitats in and adjacent to the Bay View area and outside of development area. This plan would include provisions to improve the quality of existing wetlands in the Bay View area through removal of invasive non-native plants such as periwinkle and perennial pepperweed. This enhancement plan would be developed in coordination with, and would be approved by, the US Army Corps of Engineers and the Regional Water Quality Control Board prior to implementation of the proposed action. All construction near or adjacent to wetlands would implement standard Best Management Practices to minimize runoff into these sensitive areas. Implementing grading and construction during the driest months of the year (July–October) would reduce the potential for siltation and runoff into surrounding habitats.	LTS

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BIO-3: Further development at Ames Research Center, especially in the Bay View area, could increase the potential for the introduction of additional invasive non-native species as a result of improper selection or handling of landscaping or erosion-control materials. In addition, people using the trails surrounding native habitats could inadvertently spread invasive weed seeds on their clothes or shoes.	2 through 5, and Mitigated Alternative 5	S	BIO-3: Landscaping would be designed with native species (with the possible exception of lawn areas). Invasive plants would not be used in any landscaping. Any imported soil used for landscaping must be certified as weed-free. Similarly, any erosion-control structures that contain hay or other dried plant material (e.g., hay bales) must be certified as weed-free. Any construction equipment operating within 76 meters (250 feet) of jurisdictional wetlands or other sensitive habitats in the Bay View area would be washed with reclaimed water prior to use in this area to remove potential weed seeds. The construction zone would be surveyed periodically by a qualified botanist, so that any infestations of invasive species that establish within the construction zone of the Bay View area can be eradicated before the plants can flower and set seed.	LTS
BIO-4: New development at Ames Research Center would increase the number of employees on-site, with a corresponding increase in the potential for people to release unwanted cats and establish unauthorized feeding stations for feral cats. The populations of feral cats and other predatory species would increase, and with it predation on native species, especially ground-nesting and special-status birds.	2 through 5, and Mitigated Alternative 5	S	BIO-4a: NASA and its partners would institute the following programs and policies to limit increases in predator populations: — Prohibit employees from feeding wildlife, including cats. — Institute and enforce a no pets policy in new housing. — Install trash containers that cannot be opened by predator species. — Augment the existing non-native predator control program, which includes humane trapping and removal of feral cats and other non-native predators, including, but not limited to, red fox, skunk, racoons, rats and dogs. — Conduct a public education program about the impacts caused by non-native predators and the need to refrain from feeding feral cats and other wildlife. — A regular construction cleanup crew would be designated to ensure that construction debris and trash do not attract predators or scavengers. — Trap and remove predators, including, but not limited to, red fox, skunk, racoons, rats, feral cats and dogs.	LTS

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			BIO-4b: Design north and east fences bordering Bay View housing to eliminate movement of potential predators from the housing area to sensitive wildlife areas. The design would include: — Burying the bottom portion of the fence at least 46 centimeters (18 inches) below ground level. — Making the fencing grid size small enough to prevent rats from passing through. — Placing roll wire along the top of the fencing to eliminate predators climbing over the fence and to deter avian predators from perching.	
BIO-5: Building-roosting bats may be disturbed by the demolition and renovation of existing buildings at Ames Research Center.	2 through 5, and Mitigated Alternative 5	S	BIO-5: To avoid impacts to roosting bats, a preconstruction survey of buildings to be demolished or renovated would be conducted by a qualified wildlife biologist in accordance with recommendations of the California Department of Fish and Game. If special-status roosting bats are found, CDFG would be consulted. An avoidance or mitigation plan would be developed and implemented. Avoidance measures could include construction outside of hibernation and maternal roosting time periods (winter), excluding bats from the buildings after they have left the roost to forage at night by closing entrances, and the construction of bat boxes to accommodate displaced bats. If bat boxes are used, NASA would monitor their success.	LTS
BIO-6: An increase in the population at Ames Research Center would increase the amount of refuse that may be disposed of in and around buildings. Wildlife, especially feral cats and non-native predatory species, often forage in trash receptacles where food waste is disposed. This may result in an increase of these species in and around Moffett Field, which would increase predation on native species.	2 through 5, and Mitigated Alternative 5	S	BIO-6: NASA and its partners would use trash receptors that are animal resistant, and will maintain a regular garbage disposal schedule.	LTS

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BIO-7: Lighting along roads and buildings in proposed development areas in the Bay View area may impact wildlife species by disrupting their movements, breeding, or other behaviors.	2, 4 and 5, and Mitigated Alternative 5	S	BIO-7: NASA is conducting a lighting study to determine baseline levels. When feasible, nighttime lighting would be excluded in new development adjacent to high-quality wildlife habitat in the North of Bay View area. The Bay View housing would not be allowed to cause a net increase in lighting in the areas north or east of Bay View. The impacts of necessary lighting would be minimized by using low-glare light sources (e.g., low pressure sodium lighting) mounted on short poles and directed away from native habitats. In addition, light amplification to nearby sensitive areas would be eliminated through directional lighting with baffles, non-reflective tinting on windows, and other mechanisms.	LTS
BIO-8: Removal of one hole of the golf course under Alternatives 2 and 4 would reduce existing habitat area for burrowing owls.	2 and 4	S	BIO-8: This impact would be mitigated by the creation of the burrowing owl preserve in the Eastside/Airfield area, which would be large enough to accommodate up to five pairs of owls. Thus any owls which would be affected by the removal of one hole of the golf course would have sufficient nearby habitat to relocate.	LTS
BIO-9: Development on burrowing owl habitat could cause bird mortality if burrows were destroyed while birds were underground.	2 through 5, and Mitigated Alternative 5	S	BIO-9: NASA would: — Protect owl burrows wherever possible through careful site planning and inspection during construction. — Where burrows must be removed, evict owls outside the breeding season via passive relocation based on a plan developed by a qualified owl biologist. — Replace lost burrows outside of the nesting season, before construction begins. Burrows would be replaced at a 3:1 ratio either within the owl preserves or in other suitable on-site habitat areas. — Place a Habitat Conservation Easement over burrowing owl preserves.	LTS

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BIO-10: While NASA has taken steps to avoid most potential impacts to nesting habitat, new development would result in the loss of owl nesting habitat in NRP Parcels 7 and 8. In addition, development would cause the loss of some foraging habitat, especially in the Bay View area.	2 through 5, and Mitigated Alternative 5	S	BIO-10: NASA and its partners would: — Establish a burrowing owl preserve in the NRP area which would prevent impacts to owls currently nesting within the future preserve area, and mitigate impacts to owls that might be disturbed by development on NRP Parcels 7 and 8. Restoration, including the removal of concrete, asphalt and other structures, and enhancement of the preserve in the NRP area sufficient to offset development impacts would occur prior to that development. — Design landscaping in developed areas with low growing native vegetation to enhance owl use. — Minimize the development footprint to the extent possible, and locate new development adjacent to existing development to minimize habitat fragmentation. — Minimize construction impacts on nesting and foraging habitat by restricting the area available for circulation and staging of equipment. — Manage other grassland areas at Ames Research Center to support owls and their prey.	LTS
BIO-11: There could be short-term disturbances to existing burrows if construction occurred too close to the burrows. There could also be long-term disturbances caused by increased intrusion into nesting areas by new residents, employees, and visitors and their pets.	2 through 5, and Mitigated Alternative 5	S	BIO-11a: In order to minimize short-term disturbances from construction, NASA and its partners would adopt the BOHMP, which recommends the following: — Construction near owl habitat would be scheduled outside of breeding season, which typically runs from February 1 to August 31, as much as possible. — Construction would be kept as far from nesting areas as possible. If possible, NASA would maintain a minimum 49-meter (160-foot) buffer around occupied burrows during the non-nesting season, and a minimum 76 meter (250-foot) buffer during the nesting season.	LTS

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			— If it is not possible to maintain these distances, NASA would work with a qualified owl biologist to determine appropriate distances from active burrows, fence burrows off from construction activities, and provide owls the opportunity to move by installing artificial burrows further from construction areas before construction begins. — NASA would work with a qualified owl biologist to find circulation routes, staging areas, and areas for other construction activities that will minimize impacts to owls or their burrows.	
			BIO-11b: In order to prevent long-term disturbances from increases in population associated with implementation of the NADP, NASA and its partners would: — Fence off owl habitat with attractive fencing and low, native shrubs. — Design paths around the perimeter of owl habitat to allow people to see the owls without disturbing them. — Prohibit walkers, bikers, and dogs from moving through the habitat areas. — Use signage to educate people about the owls and their sensitivities. — Monitor habitat areas after construction, and implement further protective measures as needed. — Restrict construction of roads, trails, pathways, and other development from occurring within designated burrowing owl preserves.	LTS

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BIO-12: Burrowing owls often fly fairly low to the ground, so increases in vehicular traffic as a result of new development would in turn increase the potential for owl/vehicle collisions.	2 through 5, and Mitigated Alternative 5	S	BIO-12: In order to minimize increases in vehicle collisions with burrowing owls, NASA and its partners would : — Post 25 MPH speed limits along roads adjacent to owl habitat. — Route traffic away from owl habitat as much as possible, especially at night. — Plan new roads and other transportation corridors away from owl habitat wherever possible. — Monitor traffic impacts to burrowing owls, and implement additional mitigation measures if necessary.	LTS
BIO-13: Measures to control ground squirrels could negatively impact burrowing owls, which are dependent on the squirrels for a variety of functions.	2 through 5, and Mitigated Alternative 5	S	BIO-13: NASA would: — Conduct no squirrel control in the owl preserves, and as little as possible in other owl habitat areas. — Allow squirrels to inhabit areas around new development that will not be used by people. — Work with a qualified owl biologist to develop an eradication plan that minimizes effects on burrowing owls if squirrels must be controlled.	LTS
BIO-14: New development could decrease the owls' prey base if building managers eliminated the small rodents and insects that form the burrowing owls' prey base in developed areas.	2 through 5, and Mitigated Alternative 5	S	BIO-14: To protect the owls' prey base, NASA would adopt the BOHMP, which recommends the following: — Allow small rodent and insect control only directly around buildings. — Forbid the use of biocides adjacent to or within owl habitat. — Limit, or if possible, prohibit the killing of small rodents or insects in the owl preserves, enhanced owl habitat, and any other areas where owls nest or forage.	LTS

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BIO-15: Proposed new development could increase the population of predators by planting new trees and installing light poles that provide perches for birds of prey, by creating habitat for rodents, and by increasing the population of people, some of whom may feed feral cats.	2 through 5, and Mitigated Alternative 5	S	BIO-15: In order to prevent increased predation, NASA would enforce Mitigation Measure BIO-4, above. In addition, NASA and its partners would: — Continue on-going efforts to control non-native predators in conjunction with US Fish and Wildlife. — Limit tree planting along roads or buildings adjacent to owl and other wildlife habitat areas to minimize the increase in available perches for avian predators, and modify other potential perches structurally to discourage predators. — Minimize outdoor lighting posts near burrowing owl and other wildlife habitat to reduce new perches for avian predators. Where lighting is needed for safety reasons, install devices to discourage birds from perching. — Trees in Bay View adjacent to the Western Dikes Marsh would be from the USFWS approved list. — Compensate for increases in predation by eliminating predator perches along and within the boundaries of the Western Diked Marsh, Eastern Diked Marsh and Storm Water Retention Pond. " Place roll wire atop all fencing surrounding the eastern and western diked marshes and the storm water retention pond. " Place anti-perch devices on and surrounding the Plant Engineering facilities at the northwest corner of ARC property. " If feasible, remove all landscape features within these areas that provide perches for avian predators. — If possible, avoid the use of rip rap on slopes resulting from fill of the Bay View housing area. If rip rap must be used, it must be small diameter materials that would not create habitat for rodents. — Avoid placing rip rap on existing marsh vegetation.	LTS

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BIO-16: Alternative 4 would result in the loss of approximately 11 hectares (27 acres) of burrowing owl habitat in the Bay View Area.	4	SU	There is no mitigation measure available for this impact other than reconfiguring the alternative so that it would be more similar to Alternatives 2, 3 and 5. Thus, this impact would be significant and unavoidable for Alternative 4.	SU
BIO-17: Although the measures to reduce impacts to burrowing owls are expected to be sufficient to reduce impacts to less-than-significant levels, there can be no guarantee of this without monitoring of owl populations. If the measures were ineffective and owl populations decreased, a significant impact would occur.	2 through 5, and Mitigated Alternative 5	S	BIO-17a: NASA would monitor the burrowing owl population change at Ames Research Center – including changes in adult and pair numbers, changes in chick production, and general mortality factors – in relation to these parameters as measured for a reference owl population in Santa Clara County over a 3-year period. The reference population would be determined based on population dynamics research conducted by a qualified ecologist.	LTS
			BIO-17b: If the Ames Research Center owl population or chick production (compared to the reference population) experiences a significant drop, either statistically or in the opinion of a qualified owl biologist over a 3-year time period, NASA would implement these further actions: — Hire a qualified owl biologist to determine if the population decline is due to human impacts from development in the NADP and to determine the sources of population decline due to development in the NADP. — Implement actions and management activities designed by a qualified owl biologist to mitigate those sources of population decline and to return population levels to pre-NADP development levels. — Continue monitoring owl population dynamics to determine if the mitigation measures have been successful at stabilizing the population and increasing the population to pre-NADP development levels. Measurements would be based on a 3-year time frame.	LTS

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BIO-18: There could be indirect adverse impacts if runoff from construction sites entered the existing storm drain system and the Storm Water Retention Pond.	2 through 5, and Mitigated Alternative 5	S	BIO-18: Potentially contaminated runoff would be managed using stormwater BMPs. Swales would be constructed adjacent to wetlands in upland areas to intercept and filter any runoff before it reaches the wetland. Construction of swales would be permitted within the buffer zone around wetlands, but not within the wetlands themselves.	LTS
BIO-19: There could be indirect adverse impacts if runoff from construction sites entered adjacent wetlands, decreasing water quality in these wetland communities.	5, and Mitigated Alternative 5	S	BIO-19: To minimize impacts on wetlands, construction would be avoided in the jurisdictional wetlands along the northern boundary of the Bay View area and within the buffer zone of these wetlands. Fill activities and other disturbances would be avoided in jurisdictional wetlands elsewhere in the Eastside/Airfield area.	LTS
NOISE				
NOISE-1: Buildout of the NADP would potentially expose new land uses in the Bay View, NRP, and Ames Campus areas to existing noise sources at levels exceeding those considered normally acceptable for the intended use. Buildings 19 and 20, which are proposed for housing in Mitigated Alternative 5, would be in the 70 to 75 dB and 65 to 70 dB noise exposure areas, respectively.	2 through 5, and Mitigated Alternative 5	S	NOISE-1a: For development on NRP Parcels 2, 4, 9, 10, 11, 12, 12a and 16, and the Ames Campus, noise mitigation measures, including site planning to protect noise sensitive outdoor activity areas and building sound insulation treatments to protect noise sensitive indoor spaces, would be included in project design and development. Buildings would be designed to provide an appropriate Noise Level Reduction (NLR) depending upon the designated uses of the sensitive spaces. NOISE-1b: Residential development proposed on Parcels 6, 12 and 12a would be designed so as to achieve an indoor DNL of 45 dB or less. The housing would be provided with forced-air mechanical ventilation or air-conditioning as necessary to achieve a habitable interior environment with the windows closed.	LTS
NOISE-2: Buildout of the NADP would potentially expose new land uses in the Bay View area to existing noise sources at levels exceeding those considered normally acceptable for the intended use.	2, 4 and 5, and Mitigated Alternative 5	S	NOISE-2a: For development on parcels in the Bay View area near the OARF, noise mitigation measures including site planning to protect noise sensitive outdoor activity areas and building sound insulation treatments to protect noise sensitive indoor spaces would be included in project design and development. Buildings would be designed to provide an appropriate Noise Level Reduction (NLR) depending upon the designated uses of the sensitive spaces.	LTS

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			NOISE-2b: Once development occurs in the Bay View area, NASA would operate the OARF so that noise generated by it would not exceed the following levels when measured on any residential property: L_{max} / $L_{eq\text{-}hour}$ Daytime (7 am - 10 pm) 70 / 50 Nighttime 65 / 45	
AESTHETICS				
AES-1: The lack of design guidelines, height limits, and setback requirements for the Bay View, Ames Campus, and Eastside/Airfield areas could allow future development to create too stark a contrast in terms of height, density, or architectural style.	2, 4 and 5, and Mitigated Alternative 5	S	AES-1: NASA and its partners would develop design guidelines for the Bay View, Ames Campus and Eastside/Airfield areas in order to ensure that new buildings would stylistically complement the existing buildings in the Ames Campus and Eastside/Airfield. Design guidelines for the Bay View area would include setback requirements for Stevens Creek and Western Diked Marsh, and would ensure harmonious design.	LTS
AES-2: The allowed four- to six- -story height of proposed student apartments on NRP parcel 6 could conflict with the prevailing low heights in the adjacent Berry Court Military Housing area.	2 through 5, and Mitigated Alternative 5	S	AES-2: This parcel is not large enough to hold a sufficient number of housing units if allowed heights were reduced. The visual effect would be mitigated through a combination of landscaping, screening and overall design.	LTS
AES-3: Proposed new parking structures along the Highway 101 frontage and new four- to five- story buildings around Ellis Circle could block views into and across Ames Research Center from areas across Highway 101 in Mountain View, especially the existing view corridor along Whisman Street.	2 through 5, and Mitigated Alternative 5	S	AES-3: In order to prevent the obstruction of key views of the hangars and the wind tunnels in Ames Research Center from the areas of Mountain View and Sunnyvale across Highway 101, buildings in the NRP area would be carefully sited to preserve view corridors through the new development, especially from the Whisman Street corridor.	LTS

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AES-4: New development in the Bay View area could block views from the Ames Campus area into the wetlands area in North of Bay View and to the salt ponds beyond.	2, 4 and 5, and Mitigated Alternative 5	S	AES-4: As the site plan for new development in the Bay View area was developed, NASA and its partners would design the new street layout to preserve view corridors through the new development to the North of Bay View area and the salt ponds.	LTS
AES-5: New development in the Bay View area could block views from the Stevens Creek Trail of the historic hangars and the San Francisco Bay.	2,4 and 5, and Mitigated Alternative 5	S	AES-5: NASA and its partners would use site layout to preserve view corridors from the Stevens Creek Trail through new development in Bay View to the historic hangars and to the San Francisco Bay.	LTS
AES-6: Proposed development within the Ames Campus area under Alternative 5, in the NRP area under Alternatives 2 through 5 and in the Eastside/Airfield area under Alternatives 2 and 4 could require the removal of protected trees.	2 through 5, and Mitigated Alternative 5	S	AES-6a: Where possible, NASA and its partners would carefully site any development so as to preserve the protected trees. AES-6b: Where it is not possible to preserve protected trees in place, NASA and its partners would develop a revegetation plan consistent with the requirements of the Santa Clara County Tree Preservation and Removal Ordinance.	LTS
RECREATION				
REC-1: Alternatives 2 through 4 would not supply enough new recreational space to meet demands generated by new employees and residents.	2 through 4	S	REC-1: NASA and/or its partners would develop additional active recreation areas in development areas on- the ARC site to meet recreation demands generated by new employees and residents.	LTS
REC-2: Alternatives 2 and 4 would result in removal of one hole from the golf course to accommodate the Regional Disaster Training Center.	2 and 4	S	REC-2: The golf course would be reconfigured to accommodate a full 18 holes.	LTS

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Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
CULTURAL RESOURCES				
CUL-1: Construction activities could disturb lost or undiscovered subsurface archaeological resources on the site.	2 through 5, and Mitigated Alternative 5	S	CUL-1: In the event that human remains and/or cultural materials are found in the process of implementing the NADP, all project-related construction would cease within a 15 meter (50-foot) radius in order to proceed with the testing and mitigation measures required pursuant to Section 7050.5 of the Health and Safety Code and Section 5097.94 of the Public Resources Code of the State of California. The State Historic Preservation Officer and the NASA Federal Preservation Officer would be contacted as soon as possible. Construction in the affected area would not resume until the regulations of the Advisory Council on Historic Preservation (36 CFR Part 800) have been satisfied. In the event of the discovery of human remains, the Santa Clara County Coroner would be notified by the project manager. The Coroner would make the determination as to whether the remains are Native American. If the Coroner determines that the remains are not subject to his or her authority, s/he would notify the Native American Heritage Commission, who would attempt to identify the descendants of the deceased Native American. If no satisfactory agreement can be reached as to the disposition of the remains pursuant to State law, then the remains would be reinterred with items associated with the Native American burial on the property in a location not subject to further disturbance.	LTS

LTS = Less Than Significant S = Significant SU = Significant Unavoidable Impact

Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
CUL-2: Rehabilitating existing historic structures could significantly impact their integrity.	2 through 5, and Mitigated Alternative 5	S	CUL-2a: Any project that involves the rehabilitation of contributing buildings within the Shenandoah Plaza Historic District would follow the Historic Resource Protection Plan. Appropriate landscaping would be used to avoid impact to historic buildings. The Historic Resources Protection Plan includes the guidelines for Rehabilitation of Historic structures prepared for NASA by Architectural Resources Group, and the Reuse Guideline for Hangar 1, prepared by Page and Turnbull, which comply with the Secretary of the Interior's Standards. New additions would be located on secondary facades. Restoring facades that have been previously altered would be considered as an alternative. CUL-2b: The State Historical Building Code would be used when planning for structural stability or the installation of protective or code required mechanical systems or access. CUL-2c: Design guidelines for the historic structures would be modified to include: — Replacement glass would be with like kind. — No change of exterior material would occur. — Installation of utilities would not affect historic character defining features. — New materials would not affect the historic integrity of original materials. — Ground disturbing activities would match materials in-kind.	LTS

LTS = Less Than Significant S = Significant SU = Significant Unavoidable Impact

Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
CUL-3: Infill development within the Shenandoah Plaza Historic District could threaten the District's visual integrity.	2 through 5, and Mitigated Alternative 5	S	CUL-3a: Any new building or addition to an existing building constructed within the portion of the Shenandoah Plaza Historic District that lies within Ames Research Center would follow the Historic Resources Protection Plan, which includes the Design Guidelines for New Construction in the Shenandoah Plaza Historic District prepared for NASA by Architectural Resources Group (ARG). These guidelines set parameters for compatible designs including orientation, height, setback, materials and style. The guidelines also indicate which areas must not be used as building sites. CUL-3b: Any project undertaken within the vicinity of designated or potentially-designated resources, structures or districts would be subject to review by the State Historic Preservation Officer through the Section 106 process of the National Historic Preservation Act. Any agreed upon mitigation, such as plan modification and design harmony, would be undertaken.	LTS
SOCIO-ECONOMICS				
SOCIO-1: Alternatives 2 through 5 would generate one percent or more of the new households in the Housing Impact Area between 2000 and 2015 and contribute to the regional jobs-housing imbalance.	2 through 5	S	SOCIO-1a: NASA will continue to attemptto acquire the rights to occupy as much of the Department of Defense (DOD) housing located at Moffett Field as possible to bolster the projected supply provided under each of the alternatives.	SU

LTS = Less Than Significant S = Significant SU = Significant Unavoidable Impact

Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
	Mitigated Alternative 5		SOCIO-1b: In the Mitigated Alternative 5, NASA would require the provision of 1,120 townhome and apartment units in the Bay View area, and 810 student apartment and dormitory units in the NRP area. If this level of housing development could not be achieved, NASA would commensurately scale back the employment and student generating components of the project. *The provision of these units could have the potential to create secondary impacts in the areas of traffic, air quality, infrastructure, services, noise and fiscal impact. These impacts are discussed in detail in Chapter 5. The analysis of these potential impacts concludes that there would be no significant impacts beyond those disclosed in the DPEIS. In fact, traffic impacts would be lessened. Infrastructure, service, and fiscal impacts would be mitigated through the payment of fair share contributions to sewer infrastructure and through Developer Impact Fees to offset impacts to schools, libraries and recreational programs in the City of Mountain View. Although residential uses in Building 20 would be within a 70dB noise exposure contour, this is considered conditionally acceptable by HUD and California Planning Guidelines, although not by Santa Clara County. Building 19 would be in a noise exposure area of 70 to 75 dB, which is above California Planning Guidelines conditionally acceptable levels, but is still conditionally acceptable to HUD. These noise impacts would be mitigated to less than significant levels.* SOCIO-1c: NASA would continue to evaluate the possibility of constructing housing above retail uses proposed in the NRP area. SOCIO-1d: NASA would require at least 10 percent of the on-site housing to be affordable to low income households.	
SOCIO-2: Alternative 3 would generate a net negative fiscal impact on the City of Mountain View, due in particular to increased demands on recreational and library facilities.	3	S	SOCIO-2: NASA, in collaboration with its Partners, would provide on-site library and recreation facilities. These would include community rooms within the residential portions of the project, an on-site fitness center, and reading rooms and libraries as part of the University-related uses.	LTS

LTS = Less Than Significant S = Significant SU = Significant Unavoidable Impact

Significant Impact	Applicable to Alternative(s)	Significance Before Mitigation	Mitigation Measures	Significance With Mitigation
SOCIO-3: Under Alternatives 2, 4, 5, and Mitigated Alternative 5, increases in costs generated by ARC high-school students could exceed 0.5 percent of the Mountain View-Los Altos Union High School District annual revenue limit.	2, 4, 5 and Mitigated Alternative 5	S	**SOCIO-3:** NASA and the Mountain View-Los Altos Union High School District will negotiate an agreement whereby in any given year, should the Mountain View-Los Altos Union High School District's per student operating revenues decrease below a pre-determined baseline as a direct result of enrollment generated by the NADP, NASA or its partners will compensate the District for the shortfall associated with these students. The baseline would be set to the District's per student operating revenues in the year prior to when students residing at ARC first begin attending classes in the District, and would be adjusted for cost of living and inflationary changes over time.	LTS

LTS = Less Than Significant S = Significant SU = Significant Unavoidable Impact

LTS = Less Than Significant S = Significant SU = Significant Unavoidable Impact

TABLE 0-2 **SUMMARY OF SIGNIFICANT UNAVOIDABLE IMPACTS FOR EACH ALTERNATIVE**

	Alternative				
Significant Impact	**1**	**2**	**3**	**4**	**5**
CIR-1		X	X	X	X
CIR-4				X	
CIR-5		X		X	
AQ-1		X	X	X	X
BIO-16				X	
SOCIO-1		X	X	X	X

1 INTRODUCTION

This introductory chapter provides an overview of the Final Environmental Impact Statement (EIS) as a whole. This chapter includes information on the EIS' purpose and the need for the proposed project under review. It also includes a brief overview of the history of Ames Research Center, and of the relationship between the proposed action and plans that have been adopted in the past.

A. Purpose of this Environmental Document

This Final Environmental Impact Statement (EIS) has been prepared to evaluate the environmental consequences of five alternatives for the proposed NASA Ames Development Plan (NADP) for Ames Research Center. Under the proposed alternatives, development would occur within four areas of Ames Research Center totaling approximately 600 hectares (1,500 acres). These four areas, listed below, comprise the Study Area for this EIS.

- NASA Research Park: an 86-hectare (213-acre) roughly triangular site located between the airfield, Highway 101, and the original Ames Research Center campus.
- Eastside/Airfield: a 385-hectare (952-acre) site comprised of the airfield and the lands to the east of it.
- Bay View: a 38-hectare (95-acre) site immediately north of the original Ames Research Center campus.
- Ames Campus: the original 95-hectare (234-acre) site of Ames Research Center.

This EIS has been prepared pursuant to the National Environmental Policy Act of 1969 (NEPA), as amended (42 U.S.C. 4321 *et seq.*), and according to the Procedures for Implementation of NEPA for NASA (CFR Title 14 Part 1216 subpart 1216.3).

B. Lead Agency and Cooperating Agencies

The lead agency charged with implementing the preferred alternative and reviewing its environmental consequence is the National Aeronautics and Space Administration (NASA).

In compliance with NEPA, NASA has collaborated with several other federal and local agencies during the planning and review process, all of whom have been invited to serve as Cooperating Agencies. These cooperating agencies include:

- State Office of Historic Preservation
- Bay Area Air Quality Management District
- Federal Highway Administration
- City of Mountain View
- City of Sunnyvale
- Santa Clara Valley Transportation Authority
- Caltrans

C. Location and Component Parts of the Site of the Proposed Action

Ames Research Center is located on approximately 800 hectares (2,000 acres) of land between Highway 101 and the southwestern edge of the San Francisco Bay in the northern portion of Santa Clara County, California. The City of Mountain View borders it to the south and west, and the City of Sunnyvale to the south and east. Ames Research Center is about 56 kilometers (35 miles) south of San Francisco and 16 kilometers (10 miles) north of San Jose, in the heart of Silicon Valley. Figure 1-1 shows the regional context of the site, and Figure 1-2 shows the local context.

The Study Area consists of approximately 600 hectares (1,500 acres) of land, almost all of the land under NASA's control within Ames Research Center.

FIGURE 1-1

REGIONAL CONTEXT MAP

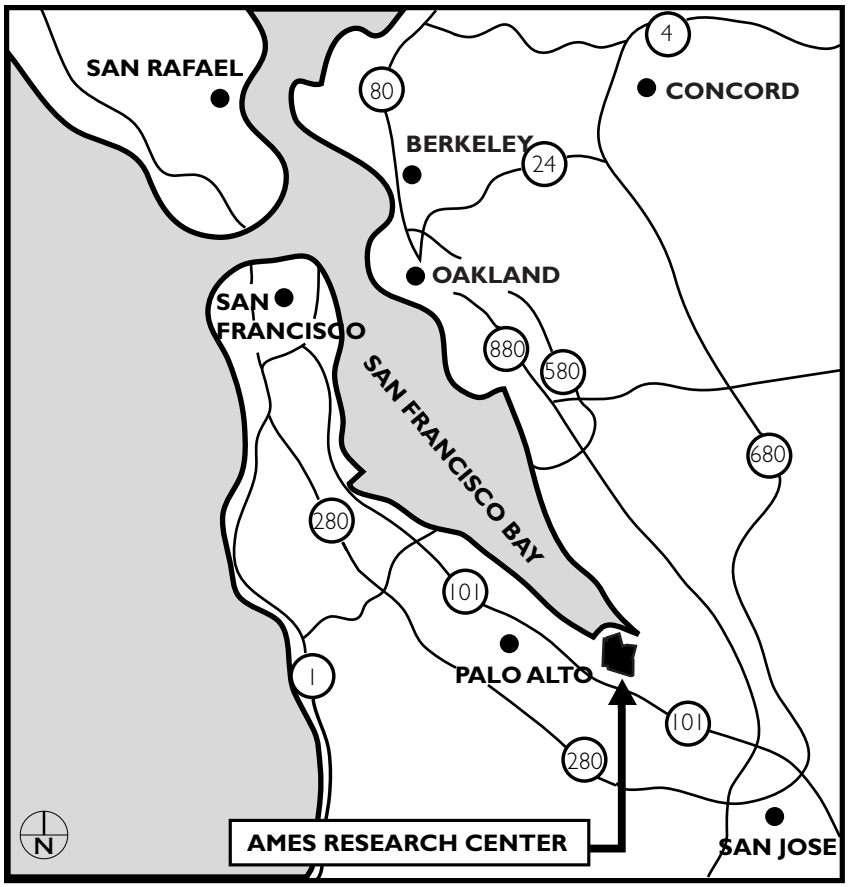
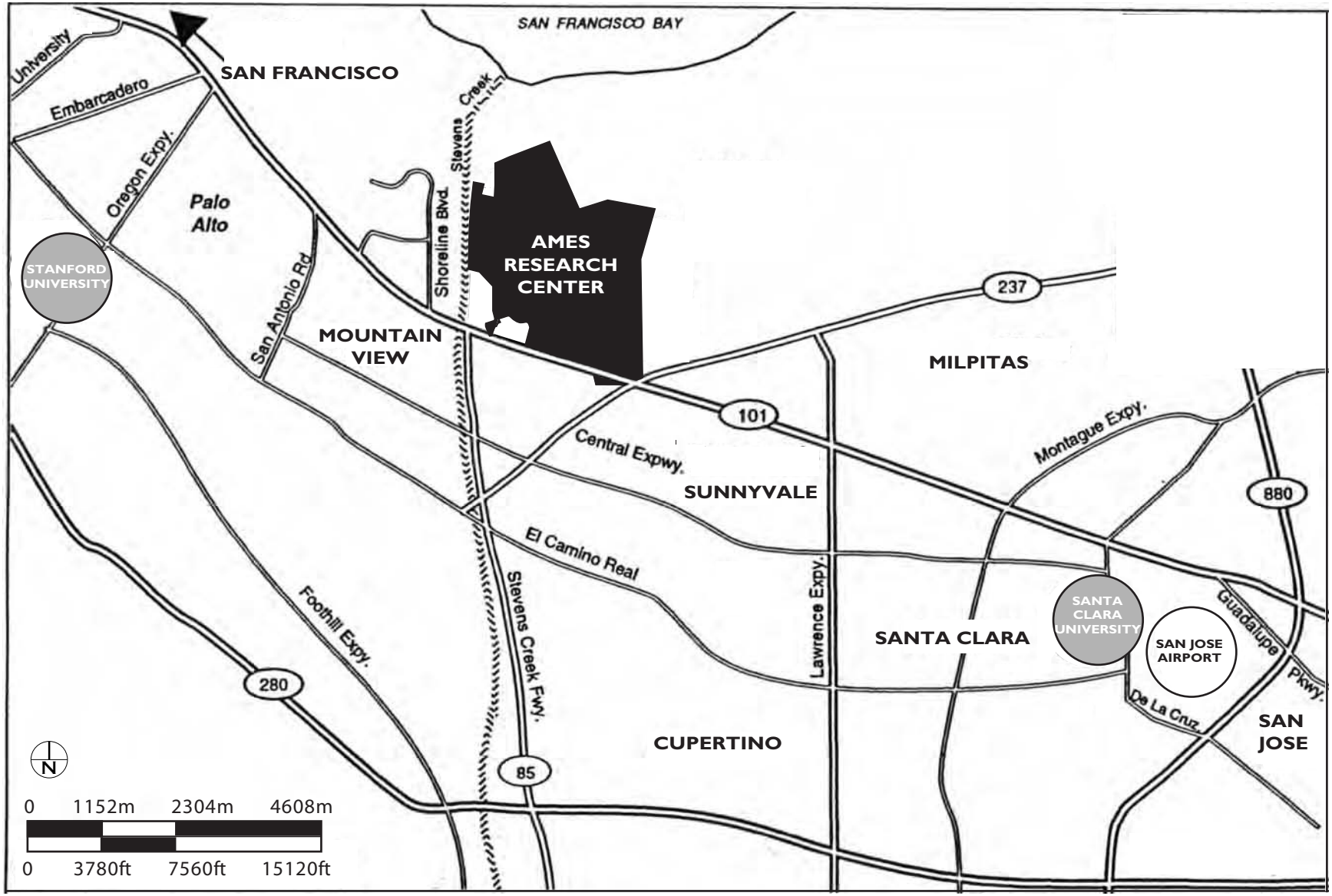


FIGURE 1-2

LOCAL CONTEXT MAP



As noted above, the Study Area is divided into four sub-areas, which are described below and mapped in Figures 1-3 to 1-7:

- **NASA Research Park:** an 86-hectare (213-acre), roughly triangular site located between the airfield, Highway 101, and the original Ames Research Center campus. This area includes most of the Shenandoah Plaza National Historic District, except for Berry Court and Hangars 2 and 3. Current uses in the NASA Research Park (NRP) area include office space, retail and business services, airfield operations, vehicle maintenance, research facilities and storage, some of which are used by the Army Reserve, Department of Defense Commissary and Exchange, Air Force and Air National Guard. The 140 existing buildings within the NRP area contain approximately 150,000 square meters (1.6 million square feet of space).
- **Eastside/Airfield:** a 385-hectare (952-acre) site comprised of the airfield and the lands to the east of it. Current uses include the golf course, Hangars Two and Three, and the airfield operations, fueling and munitions storage facilities of the California Air National Guard (CANG).
- **Bay View:** a 38-hectare (95-acre) site immediately north of the original Ames Research Center campus. This land is predominantly undeveloped upland grassland containing a few research facilities such as the Outdoor Aerodynamic Research Facility.
- **Ames Campus**: the original 94-hectare (234-acre) site of Ames Research Center. This area was referred to as the Existing ARC Facilities in the Notice of Intent filed in June 2000, and in scoping meetings held in July 2000. Current uses in the Ames Campus area include office, research and development, and storage. The existing buildings in the Ames Campus area contain approximately 268,000 square meters (2.89 million square feet) of space.

D. Brief History of Ames Research Center

Ames Research Center sits almost entirely on one of the last intact land grants in California. It was originally granted in 1844 to Ynigo, a Native American, by Micheltorena, the governor of the Mexican state of California. The rancho was called Posolmi or Pozita de las Animas: "Little Well of the Souls." The former rancho was chosen as the site for Moffett Field after a fierce competition between San Diego and the Bay Area to house the Navy's West Coast dirigible base. In one of the first cooperative regional economic development campaigns, Santa Clara, San Mateo, San Francisco and Alameda Counties set up a joint program to find a site for the new base, purchase it, and donate it to the Navy. The counties eventually purchased approximately 400 hectares (1,000 acres) of the Ynigo Rancho at a cost of almost $500,000 and offered it to the Navy for $1 to match the offer at Camp Kearney in San Diego. After a long battle in the press and in Congress, President Herbert Hoover signed the bill allowing the Navy to accept the site and appropriating $5 million for construction in 1930. The base officially opened in 1933.

Moffett Field was built to house the biggest aircraft of its day: the *USS Macon*, a 239-meter (785-foot) long dirigible that arrived at Moffett Field for the first time in 1933. To house it, the Navy built the massive Hangar 1, one of the best-known landmarks in the Bay Area. The *Macon* was intended to provide long-range reconnaissance for the Pacific Fleet, but it flew only eight missions before it crashed off the coast of Monterey in 1935.

With the *Macon* gone, the US Navy no longer had a demonstrable use for Moffett Field. It was transferred to US Army command and became a base for the Army Air Corps, the predecessor to the US Air Force. After the attack on Pearl Harbor, the military decided it needed aircraft to patrol the Pacific for submarines and mines, and the Navy responded by restarting the lighter-than-air project with smaller blimps only 75 meters (246 feet) in length.

Even Hangar 1 was insufficient to house all the activity around the revitalized lighter-than-air reconnaissance project. In 1942, two more huge hangars were

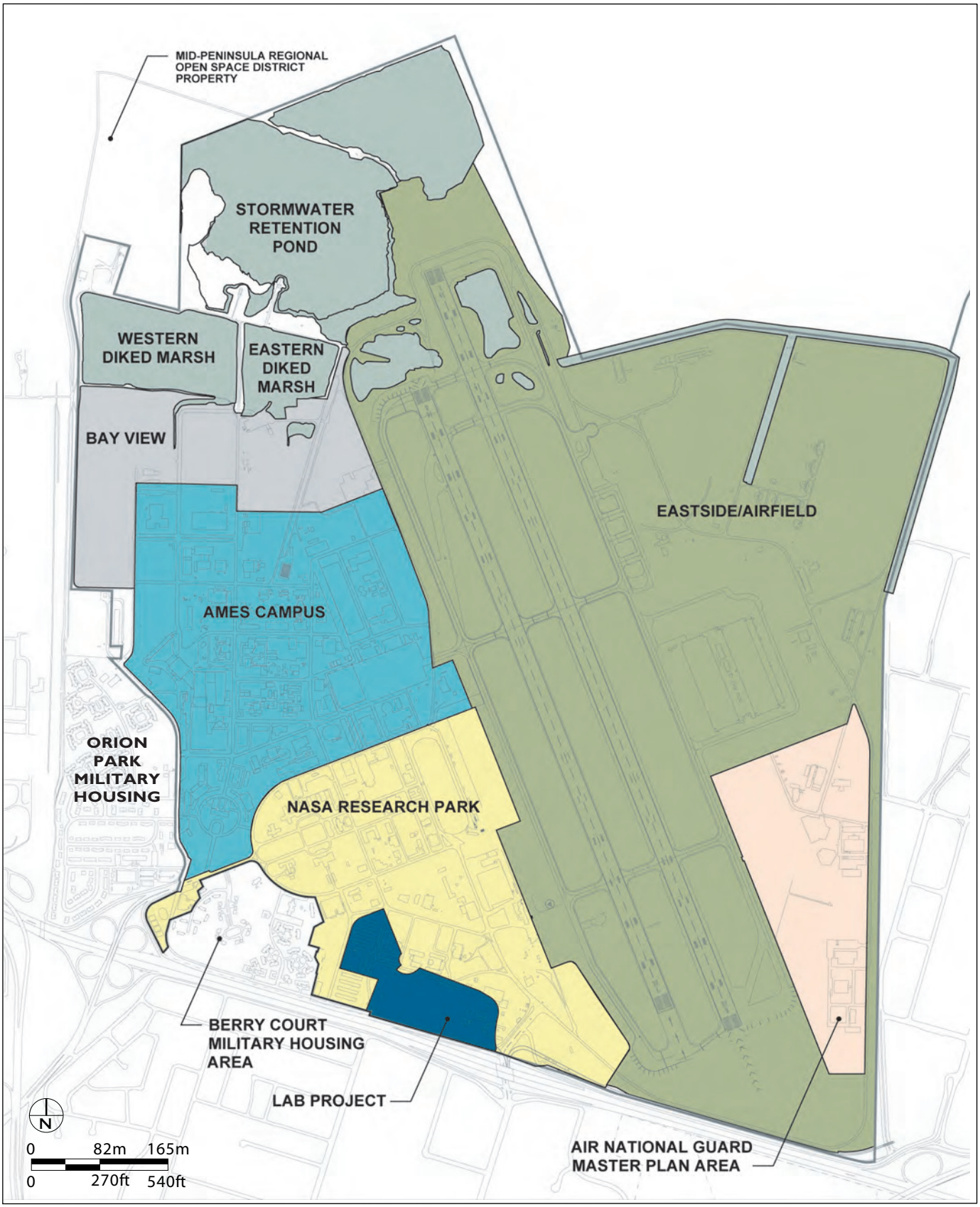


FIGURE 1-3

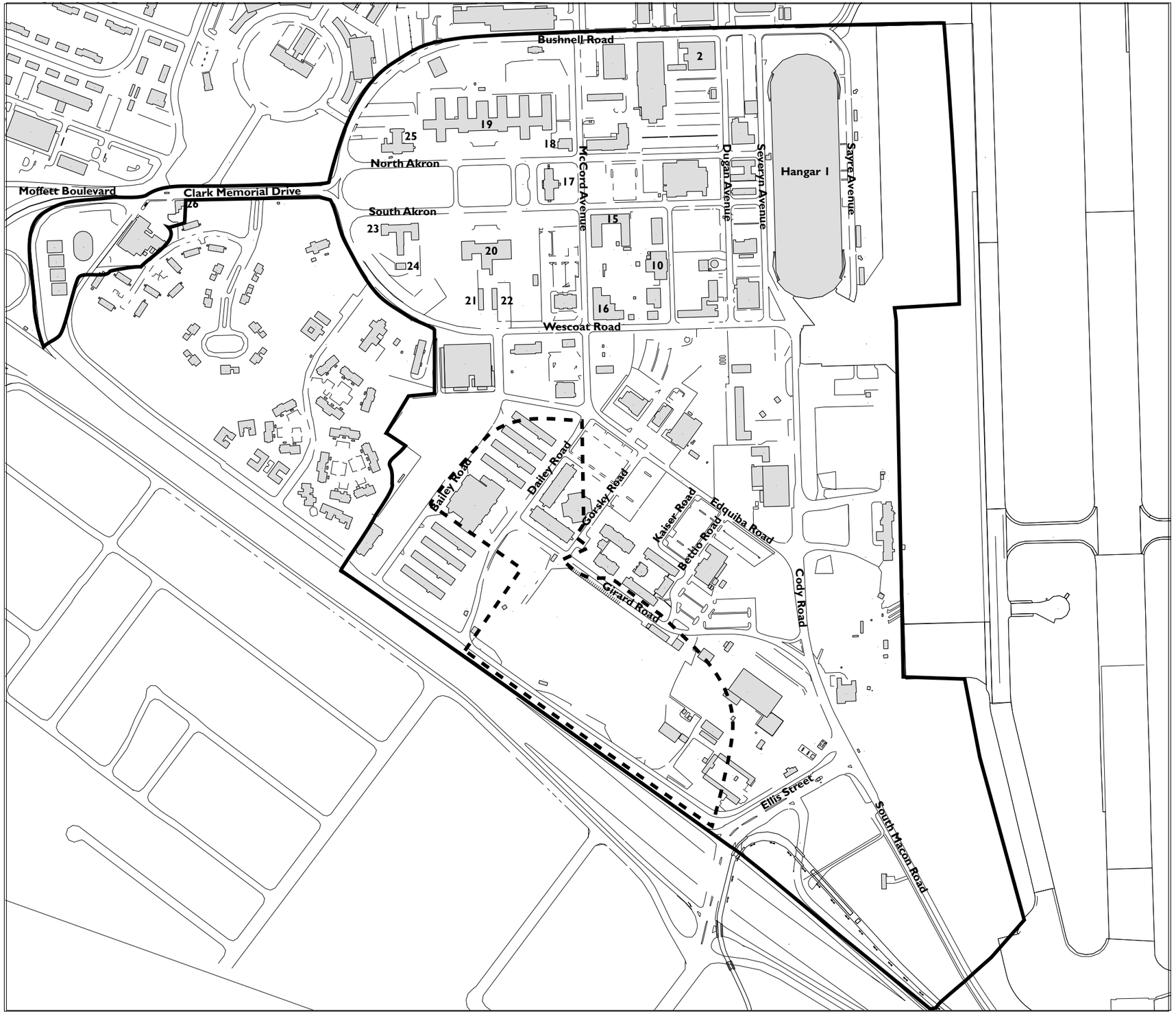
DEVELOPMENT AREAS

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

FIGURE 1-4

NASA RESEARCH PARK



Development Area Boundary

Lab Project Area

0 27m 53m 119m

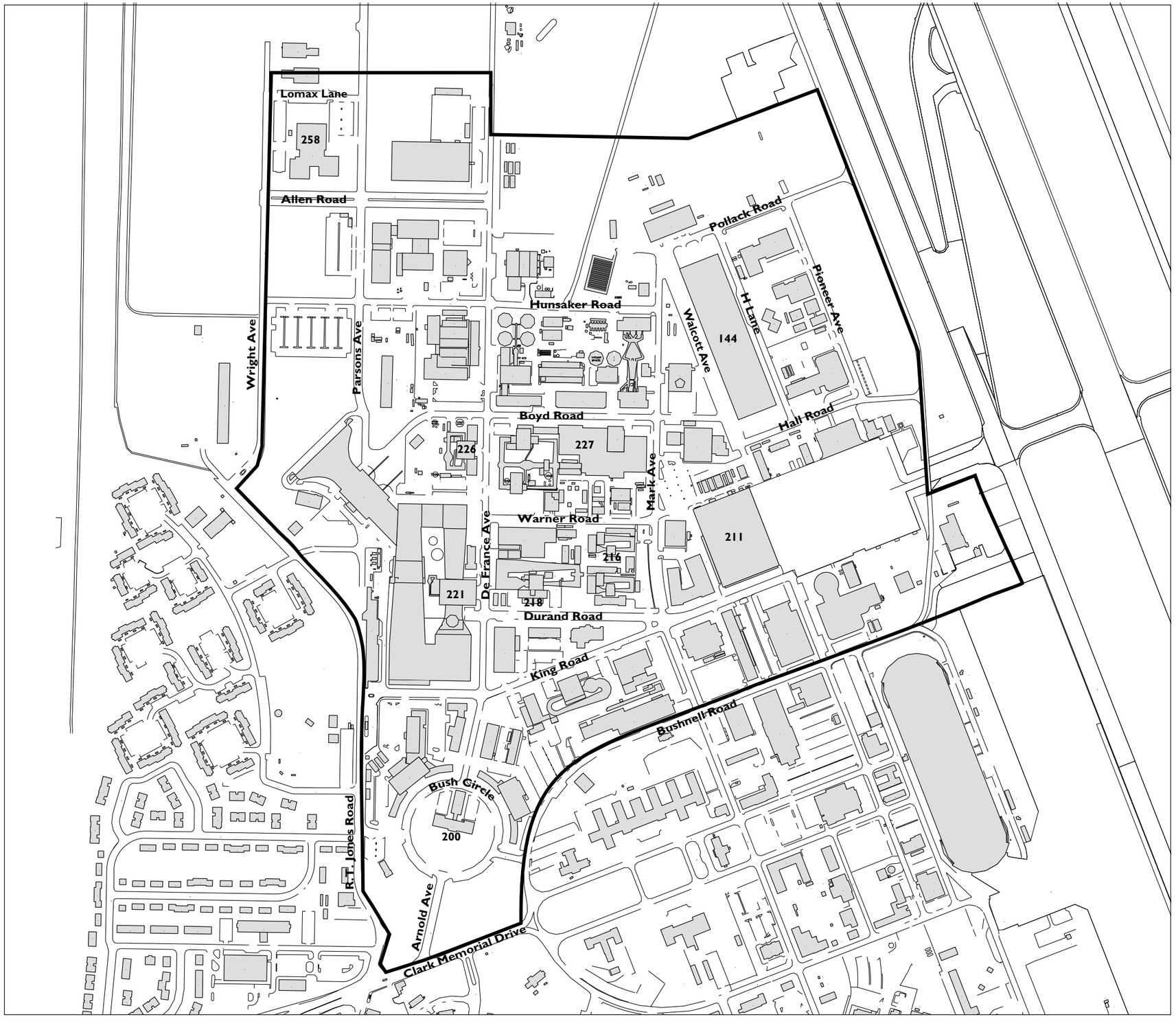
0 88ft 175ft 350ft

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

FIGURE 1-5

AMES CAMPUS



Development Area Boundary

N

0 28m 59m 119m

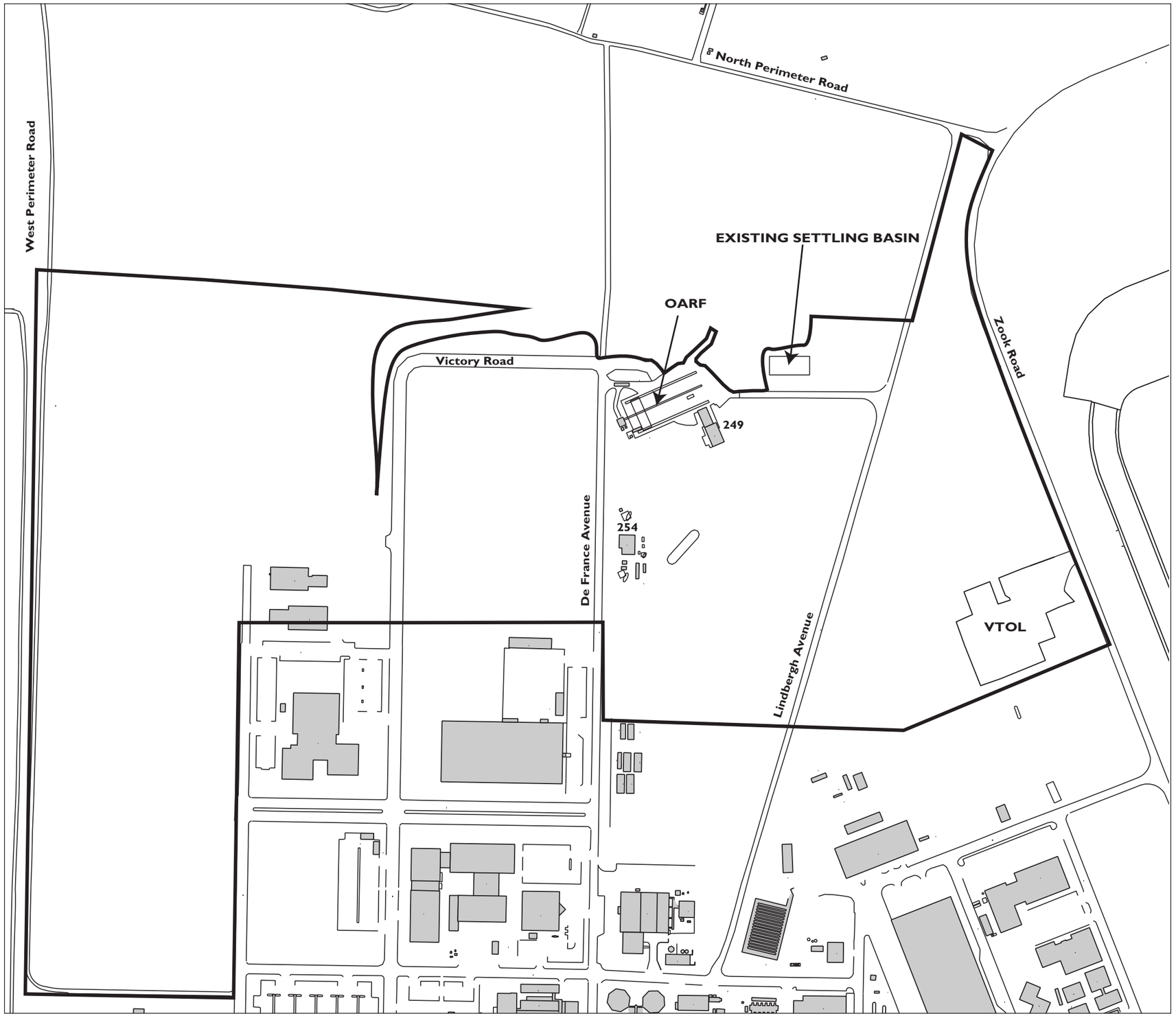
0 98ft 195ft 390ft

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

FIGURE 1-6

BAY VIEW



Development Area Boundary

N

0 19m 40m 79m

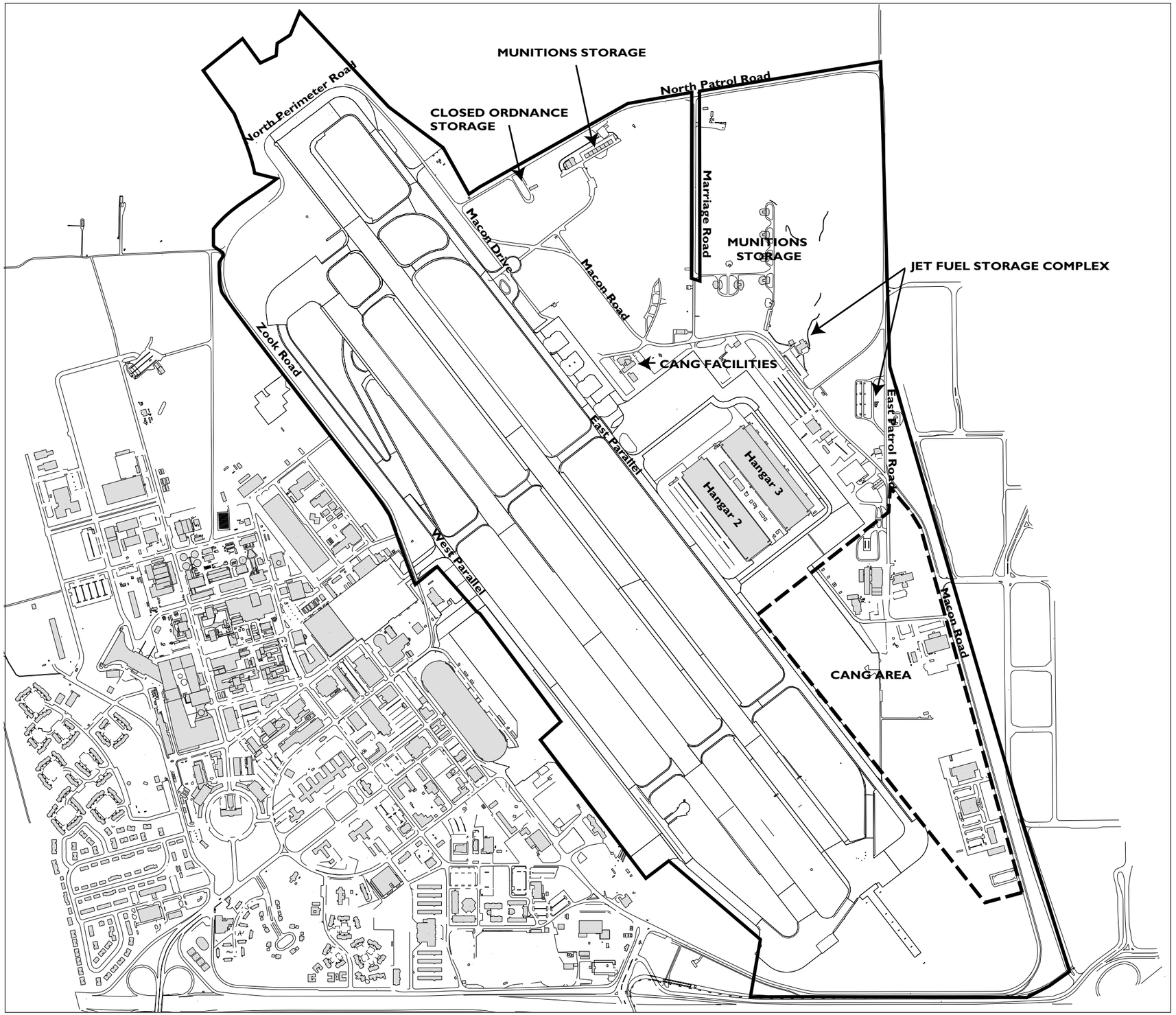
0 65ft 130ft 260ft

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

FIGURE 1-7

EASTSIDE/AIRFIELD



Development Area Boundary

CANG Area

0 500' 1000' 2000'

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

constructed in record time, primarily out of wood and concrete because of war-time shortages of steel. As many as 20 blimps at a time were on duty at the base during the war years, and Moffett Field had an excellent record of ship and mine detection. But as jet airplanes were developed and began to take over the functions of the blimps, the lighter-than-air program went into decline. In 1947, the last blimp at Moffett Field was deflated. The era of lighter-than-air ships was over.

In the post-War era, Moffett Field became a jet airplane base. At first it was home to air transport and repair squadrons. When the Korean War began, however, Moffett Field became the home base for jet fighters serving on aircraft carriers in the Pacific. In the 1960's, Moffett Field returned to its original mission of long-range reconnaissance and anti-submarine patrols with the arrival of the Navy's newest anti-submarine aircraft: the P-3 "Orion." By 1973, aircraft based at Moffett Field were responsible for patrolling approximately 241 million square kilometers (93 million square miles) of the Pacific Ocean, an area stretching from the coast of Alaska to Hawaii.

During the same post-war period, Moffett Field became a major center for the development and testing of new aviation and flight-related technology. Congress originally established Ames Research Center in 1939 as the Ames Aeronautical Laboratory under the National Advisory Committee for Aeronautics (NASA's predecessor). In 1958, Congress created NASA with the National Aeronautics and Space Act of 1958, (42 U.S.C. § 2451 et seq.). The Ames Aeronautical Laboratory was renamed Ames Research Center and became a NASA field center. Over the years, Ames Research Center used its laboratories and wind tunnels to test dozens of propulsion systems and airplane designs. As the coalition of Bay Areas counties predicted when it lobbied for the creation of Moffett Field in the late 1920's, the base's research program and facilities catalyzed the development of numerous private technology and aerospace corporations, among them Hiller Aircraft Corporation and Lockheed Martin.

In 1991, as part of cost-cutting measures by the US Secretary of Defense, the Federal Base Closure and Realignment Commission decided to decommission Moffett Field. NASA decided to take over the operation of Moffett Field because the airfield had become essential for Ames' aerospace and aeronautic research. In 1994, NASA took control of Moffett Field, and began planning how to use the newly acquired land to support its research mission.

Today, aerodynamic testing and other research occurs in an area referred to as the Ames Campus, which now includes more than 50 buildings on 95 hectares (234 acres). The Ames Campus area's wind tunnels and immediate proximity to a federal airstrip have made it an invaluable facility for testing the largest new airplane prototypes. In addition to aerospace engineering, ARC is NASA's lead center for research in astrobiology, a multi-disciplinary field which studies the origin and distribution of life in the universe, the effects of gravity on living organisms, and the Earth's atmosphere and ecosystems. The third focus of research at ARC is information science and technology. ARC is NASA's lead center for information technology with the responsibility to strategically maintain and increase NASA's preeminent position in this field. Ames Research Center has full management responsibility for key programs such as Intelligent Systems, High-Performance Computing and Communication, Design for Safety, and Nanotechnology. ARC is recognized worldwide for its historic and on-going work developing innovative, intelligent, high performance information technologies to enable space and aeronautics missions.

E. The Existing Comprehensive Use Plan and Subsequent Planning Efforts

When NASA took control of Moffett Field, it developed a Comprehensive Use Plan (CUP) for the base. The CUP has served as the guiding document for development at Ames Research Center since its preparation, environmental review, and approval in 1994. The NADP, once adopted, will replace the CUP as the operative planning document for Ames Research Center.

The CUP foresaw a program of demolition and new construction, with a total of just over 93,000 square meters (1 million square feet) of new building space across the entire base constructed over a period of 15 years. Under the CUP, the airfield was to remain restricted to government use, although operations were allowed to increase to up to 80,000 flights per year. Administrative and operational support services were to increase slightly. The largest change on the base was foreseen to be in research and development activity, with just over 79,000 square meters (800,000 square feet) of new R&D space for laboratories, wind tunnels and other related facilities. NASA is proposing to construct an advanced space research lab and related office and R&D space, as well as temporary museum facilities, under the CUP. This is described in more detail in Chapter 2 of this EIS.

In 1996, NASA considered allowing the Air Force to host commercial air cargo members of the Department of Defense's (DOD) Civil Reserve Air Fleet (CRAF) at Moffett Field to augment DOD military airlift needs with civil air carrier resources. NASA prepared a draft Environmental Assessment (EA) and conducted public meetings to gather input on the CRAF proposal. In response to public opposition, NASA decided not to implement CRAF operations at Moffett Field.

Later that year, the cities of Mountain View and Sunnyvale appointed a 19-member Citizens Advisory Committee (CAC) to study and provide input to NASA about the future uses of Moffett that would best meet NASA's mission requirements and be supported by the communities. The Director of Ames Research Center, Dr. Henry McDonald, led the development of NASA's six point initiative, which outlined program goals and reuse concepts for the development of the former Navy base. After extensive public outreach and numerous public meetings, the Final Report, issued in 1997, of the Community Advisory Committee endorsed NASA's six point initiative.

Based on the six point initiative, NASA decided to build on the full range of its existing high-tech and aviation resources at Ames Research Center to develop partnerships with government agencies, local universities, private industry and

non-profit organizations to create a collaborative research and development environment. With these partner organizations, NASA proposes to develop a world-class, shared-use education and R&D campus. This is the subject of the project reviewed in this EIS.

F. Project Purpose and Need

NASA's mission includes undertaking aeronautical and space activities for the nation's welfare and security, expanding knowledge of the Earth and of phenomena in the atmosphere and space, using the engineering and research resources of the United States effectively and developing ground propulsion, advanced aviation propulsion and bioengineering research, development and demonstration projects. Ames Research Center pursues this mission as NASA's lead center for information sciences with the responsibility to strategically maintain and increase NASA's position in this field. Ames Research Center has full management responsibility for key programs such as Intelligent Systems, High-Performance Computing and Communication, Engineering for Complex Systems and Nanotechnology.

Ames is additionally responsible for building human expertise and physical infrastructure in direct support of Agency missions in astrobiology and aerospace operations. NASA Ames fulfills this mission through the development and operation of unique national facilities. Ames also fulfills its mission through the conduct and management of diverse leading-edge research and technology programs from the fundamental biology program to the thermal protection system research and the aviation system capacity program.

Proposed development under the NASA Ames Development Plan has the purpose of furthering NASA's mission by providing the vital scientific, engineering, and academic community necessary to create crucial research focused on the advancement of human knowledge about space, the Earth, and society. The NADP would extend and deepen the research and development capabilities of NASA Ames Research Center through R&D partnerships in key

research areas. Major areas of research would include astrobiology, life and space sciences, nanotechnology, information technology, and aerospace engineering. The new campus would also enhance the regional economy by expanding the opportunities available to the local aerospace and high-tech industries and educators. The project would create a needed vibrant research and education infrastructure that leverages existing budgets and other resources. The development plan is needed to advance NASA's research leadership, facilitate science and technology education, and create a unique community of researchers, students and educators. This unique community is needed to address the research problems of tomorrow: not from NASA alone, not from industry alone and not from universities alone will tomorrow's innovations emerge. They will come from the integration of these different segments, each making the most of their unique attributes-NASA's focus on high-risk, long-term research; industry's ability to react quickly with applied technologies; and the universities' expertise in educating and providing a vibrant workforce for the future.

A secondary purpose of the project is to enhance ARC's research capabilities and enable more efficient use of its land. The demolition of older buildings, reuse of existing buildings, and construction of new facilities involved in the creation of the new campus would make the best use of land at Ames Research Center while minimizing impacts on surrounding areas. New development will incorporate principles of energy efficiency, water conservation, transportation demand management, and seismic safety.

By integrating public and private research and development efforts, Ames Research Center would serve as a hub of technology transfer. Collaboration with NASA's development partners would keep ARC's researchers involved in cutting-edge technology advances in Silicon Valley, the San Francisco Bay Area and beyond, and promote commercial applications of the basic scientific research done at Ames Research Center.

All three of the components noted above---provision of a larger on-site scientific, engineering and academic community; enhanced research capabilities

and more efficient land use; and collaboration with private partners---are needed to allow NASA to remain on the forefront of technological advances being made throughout the Bay Area, and particularly in Silicon Valley. When NASA was first formed in 1958, it and other government entities took the lead in the development of many technologies, including computing and bio-engineering. Today, many universities and private corporations are leaders in these technologies. NASA must expand its research capacities and build new bridges to academic institutions and corporations if it is to remain a leader in technology and make innovations developed by others available for space and aeronautical research.

By establishing the NASA Research Park, Ames will leverage NASA resources for greater mission benefit, enhance scientific research, technology advancement and transfer of knowledge, improve NASA's education and outreach programs, provide workforce development for high-tech careers and increase public involvement in science, technology and exploration.

G. Organization of this EIS

This EIS is organized into nine chapters, a summary, appendices, and an index as described below.

- The **executive summary** describes the alternatives, and provides an overview of key environmental impacts and the measures proposed to mitigate them.
- **Chapter 1** is this introduction.
- **Chapter 2** describes the five alternatives for the redevelopment of the Study Area.
- **Chapter 3** describes the area affected by the NADP and the baseline for assessing the impacts associated with each alternative. This chapter covers public policy, land use, traffic and circulation, air quality, infrastructure and drainage, hazardous materials, geology, biological resources, visual

impacts, noise, cultural resources, recreation, and socio-economic conditions.

— **Chapter 4** describes the environmental impacts associated with each of the five alternatives, and describes mitigation measures that would reduce or prevent those impacts. In particular, it includes information on the project's air quality conformity determination, Section 106 historic resources consultation and Section 7 endangered species consultation, as well as information on impacts in all other areas of concern.

— **Chapter 5** describes and contains the analysis for the Mitigated Alternative 5, which was conceived in response to comments on the Draft Programmatic EIS. Mitigated Alternative 5 takes the place of the Alternative 5 presented in the Draft Programmatic EIS as the Preferred Alternative.

— **Chapter 6** summarizes NEPA-required information on local short-term uses of environment versus long-term productivity, irreversible and irretrievable commitments of resources, growth-inducement, cumulative effects and the project's compliance with federal executive orders and laws.

— **Chapter 7** contains a list of the preparers of this EIS, and of the agencies and organizations who received copies of the document to review.

— **Chapter 8** is the bibliography which lists all documents cited in this EIS.

— **Chapter 9** is a glossary of key terms and **Chapter 10** is the index.

— **Chapter 11** is an introduction to Volume III, which was assembled after the public review period on the Draft Programmatic EIS.

— **Chapter 12** contains the list of agencies, organizations, and individuals who commented on the Draft Programmatic EIS.

— **Chapter 13** contains reproductions of all comment letters received during the public review period, transcripts of public hearings, and responses to all comments.

— The **appendices**, which are incorporated by reference and published separately, contain background material prepared as part of the environmental analysis of the five alternatives.

H. Systems of Measurement

NASA policy dictates that all measurements should be written in the metric system. Most of the numbers in this document were originally computed using the English system of measurement, so they have been converted into the metric system and rounded to the nearest significant digit. Throughout the text of this EIS, the original English measurement follows the metric number in parentheses. For example, the size of a particular buildings would be listed as 9,000 square meters (100,000 square feet).

I. Review, Implementation and Permitting of the Proposed Action

1. Review Process

The Draft EIS was subject to a 50-day review and comment period during which the public, responsible agencies, and other interested jurisdictions, agencies, and organizations submitted comments on the document and the NADP. Under NEPA, the review period is only required to be 45 days long, but NASA allowed for a 50-day review period due to the importance of the project. This review period extended from December 10, 2001 to January 28, 2002.

During the review period, there were public meetings at Ames Research Center and in Sunnyvale and Mountain View to receive feedback on the Draft EIS. Comments were submitted at these public meetings and in writing. Written comments were submitted to Ms. Sandy Olliges, NASA Ames Research Center, Environmental Services Office, Mail Stop 218-1, Moffett Field, CA 94035-1000. Electronic mail was sent to researchpark@arc.nasa.gov.

After the close of the review period, NASA and its consultants prepared written responses to all substantive comments within the scope of the project received during the review period on the Draft EIS. Responses to the comments are presented in Chapter 12 of this Final EIS Changes to the Draft EIS have been incorporated into this Final EIS. A Notice of Availability (NOA) of this Final EIS was published in the Federal Register.

The Final EIS will be reviewed by NASA and, if it is judged to be comprehensive, a Record of Decision (ROD) approving the EIS will be signed by NASA 30 days after the Final Programmatic EIS is published . A Mitigation Implementation and Monitoring Plan (MIMP), which details all the mitigation measures and assigns responsibility for their implementation, will be prepared concurrently with the ROD. The ROD, when signed, will adopt a specific alternative of the NADP, and will commit NASA to the mitigations described in the EIS, which will be implemented and monitored in accordance with the MIMP.

A copy of the Final EIS was mailed to all commentors who requested a copy and to federal, state and local agencies who have special expertise and/or jurisdiction by law.

2. Project Implementation

After the ROD is signed, NASA will begin implementation of the NADP. Project implementation will include execution of agreements and leases with project partners and construction of the new facilities described in this EIS.

Given constraints imposed by the Clean Air Act (42 U.S.C. Sections 7401 *et seq.*), NASA will be limited to construction and operations (including mobile sources such as traffic) that generate no more than 91,000 kilograms (100 tons) of ozone precursors per year. This will limit the amount of new construction that can occur in any given year. The exact timing of the construction of individual facilities will be determined by NASA in consultation with its partners as the project progresses.

All projects to be constructed under the NADP will be evaluated by NASA for compliance with NEPA to determine if the proposed project's scope and impacts were adequately described in this Programmatic EIS. In addition, State partners will conduct their own CEQA reviews.

Future projects implemented pursuant to the NADP will be evaluated for NEPA compliance by the NASA Ames Environmental Services Office, using a NEPA Environmental Checklist to determine if the project's environmental impacts were adequately described in the NADP EIS. If the project is adequately covered by the NADP EIS, this will be documented in a Record of Environmental Consideration (REC), which will be signed by the Chief of the NASA Ames Environmental Services Office. Any applicable mitigation measures will also be identified in the REC. If the project is not adequately covered by the NADP EIS, then the REC will indicate the required level of additional NEPA review, either an EA or an EIS.

In addition to the NEPA review, NASA will review its partners' proposed projects for compliance with the NADP Design Guide; the TDM Program; the Historic Resources Protection Plan (HRPP); the Environmental Issues Management Plan (EIMP); federal, state and local environmental, health, and safety laws, regulations, and ordinances; Executive Orders; NASA Ames policies; and other applicable codes and standards. This additional review will be conducted by the NASA Ames Permit Review Board. Construction permits will be signed by the Chief Building Official at NASA Ames.

3. Required Federal Consultations

Beyond NEPA compliance, development under the NADP will require the following consultations to conform with federal law:

- *Determination of conformity with carbon monoxide (CO) emission requirements of the 1990 Clean Air Plan by the Bay Area Air Quality Management District.* Section 176(c) of the Clean Air Act Amendments requires Federal agencies to assure that their actions conform to applicable plans for achieving and maintaining the National Ambient Air Quality

Standards. The primary oversight responsibility for assuring conformity is assigned to the Federal agency. The proposed action is located in the Bay Area Air Quality Management District, which the Environmental Protection Agency has designated a nonattainment area for the ozone standard and a maintenance area for the national carbon monoxide standard. NASA has been in consultation with the BAAQMD regarding the conformity of the proposed action with the State Implementation Plan, and has made a determination of conformity. This is described in Sections 3.4 and 4.4 of this EIS.

— *Section 106 approval for preservation of cultural resources by the State Historic Preservation Office.* Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their actions on historic properties and seek comments on their actions from an independent reviewing agency, the State Historic Preservation Office (SHPO) and/or the Advisory Council on Historic Preservation (ACHP). Title 36 of the Code of Federal Regulations provides the methodology for assessing impacts on historic resources and details the requirements of the consultation process. For complex projects expected to continue over time, the regulations allow development of a Programmatic Agreement (PA) that governs ongoing and future activities undertaken as part of the project or program it addresses. An agency's obligations under Section 106 are satisfied once a PA is finalized and implemented. Pursuant to these regulations, NASA is preparing to enter into a PA with the ACHP and the SHPO to implement the NASA Ames Research Center HRPP and use its historic properties with clearly defined consultation requirements. The Draft PA is in the appendices of the HRPP, available under separate cover as Appendix G of this EIS. Historic resources and impacts to them are analyzed in Sections 3.13 and 4.13 of this EIS.

— *Consultation with the US Fish and Wildlife Service under the Endangered Species Act (16 U.S.C. Sections 1531 et seq.).* The Endangered Species Act of 1973 protects animal and plant species currently in danger of extinction (endangered) and those that may become endangered in the foreseeable future (threatened). The Act provides for the conservation of ecosystems

upon which threatened and endangered species of fish, wildlife, and plants depend, both through Federal action and by encouraging the establishment of state programs. Section 7 of this act requires Federal agencies to ensure that all federally associated activities within the United States do not harm the continued existence of threatened or endangered species or designated areas (critical habitats) important in conserving those species.

Agencies must consult with the United States Fish and Wildlife Service (USFWS), which maintains current lists of species designated as threatened or endangered, to determine the potential impacts a project may have on protected species. The USFWS has established a system of informal and formal consultation procedures. The USFWS preparation of a Biological Opinion concludes formal consultation.

Effects on vegetation and wildlife resources that would occur with the implementation of the NADP were analyzed under consultation with the USFWS. A Biological Assessment, which is available under separate cover as Appendix E, has also been conducted to determine project effects on fish and wildlife resources and has been submitted to the USFWS. More information on biological resources is contained in Sections 3.9 and 4.9 of this EIS.

— *Consistency with the San Francisco Bay Plan is required by the Federal Coastal Zone Management Act.* The Coastal Zone Management Act (CZMA) of 1972 addresses actions affecting coastal zones and requires that federal actions be consistent with state coastal zone management plans. Under the CZMA, federal actions must be consistent with local coastal zone management programs. In California, these programs generally include the California Coastal Act and Local Coastal Plans. In the case of the NASA Ames Research Center, the operative coastal zone management program is administered by the San Francisco Bay Conservation and Development Commission (BCDC) and generally consists of the McAteer-Petris Act, BCDC's *Bay Plan*, special area plans adopted by BCDC, and BCDC's regulations.

The BCDC's *San Francisco Bay Plan* contains the BCDC's enforceable policies and designates on Plan Maps the shoreline areas that are reserved for regional high-priority uses such as water-oriented recreation, seaports and airports. BCDC may issue permits for non-federal entities' proposed projects in priority use areas if the use is consistent with the designated priority use as well as the other provisions of the McAteer-Petris Act and the Bay Plan. BCDC would issue a consistency determination for federal agencies.

Bay Plan Map 7 designates Moffett Field as an airport priority use area and the Plan Map policy note regarding Moffett Field states "Moffett Naval Air Station - If and when not needed by the Navy, site should be evaluated for commercial airport by regional airport system study. (Moffett NAS not within BCDC permit jurisdiction.)" Although most of the area proposed for development under the NADP is outside BCDC permit jurisdiction, all of Moffett Field is subject to BCDC's coastal management program authority because Moffett Field is either in or directly affects the coastal zone.

NASA has prepared a consistency determination for the entire NADP project relative to the local coastal zone management program administered by BCDC, and submitted this determination to BCDC on April 12, 2002. At the request of BCDC, NASA submitted additional information on May 29, 2002 to support the consistency determination. This consistency determination concluded that the proposed NADP would be consistent to the maximum extent practicable with the *Bay Plan*, the McAteer-Petris Act and the Coastal Zone Management Act.

2 DESCRIPTION OF ALTERNATIVES

This chapter describes five alternatives for development under the NASA Ames Development Plan (NADP). The sections that follow describe and evaluate the characteristics of each of the alternatives with respect to land use, job generation, open space, security, and circulation. The baseline against which the alternatives are evaluated and the cumulative projects in the area are also described. The potential environmental impacts of each alternative are analyzed in detail in *Chapter 4: Environmental Consequences*.

The five alternatives described in this chapter are summarized in Table 2-1 and consist of the following:

- **Alternative 1: The No Project Alternative.** Under the No Project Alternative, no new development would be proposed for Ames Research Center at this time. However, NASA would implement several projects already approved, as described in Section A, below, so that "No Action," the typically-employed term under NEPA, would not accurately describe the baseline condition. In addition, "No Project" is the CEQA equivalent of "No Action" and so very familiar to the public reading the document. Thus Ames Research Center staff have determined that this alternative should be referred to as "No Project" rather than "No Action" in order to minimize confusion for the public.
- **Alternative 2.** Alternative 2 proposes to develop approximately 363,000 square meters (3.9 million square feet) of new space in the NRP, Bay View, and Eastside/Airfield areas. Within the NRP area, there would be approximately 192,000 square meters (2.1 million square feet) of new educational, office, research and development, museum, conference center, housing and retail development, approximately 52,000 square meters (560,000 square feet) of existing non-historic structures would be demolished, and approximately 46,000 square meters (500,000 square feet) of existing space would be renovated. Alternative 2 proposes approximately 121,000 square meters (1.3 million square feet) of new educational and housing development in the Bay View area, and approximately 51,000 square meters (550,000 square feet) of new low-density research and development and light industrial space, in addition to the renovation of Hangars 2 and 3, in the Eastside/Airfield area. Total

build out under this alternative would be approximately 845,000 square meters (9.1 million square feet).

— **Alternative 3.** Based on the ideas of Traditional Neighborhood Design, Alternative 3 would create a new mixed-use development within the NASA Research Park area. Alternative 3 proposes the addition of approximately 284,000 square meters (3 million square feet) of new educational, office, research and development, museum, conference center, housing and retail development, the demolition of approximately 52,000 square meters (560,000 square feet) of non-historic structures, and the renovation of approximately 46,000 square meters (500,000 square feet) of existing space. Alternative 3 does not propose any new construction in the Bay View or Eastside/Airfield areas, although Hangars 2 and 3 in the latter area would be renovated for low-intensity research and development or light industrial uses. The total build out under this alternative would be approximately 760,000 square meters (8.2 million square feet).

— **Alternative 4.** Alternative 4 would concentrate more of the new development in the Bay View area than would the other alternatives, while creating less dense development in the NRP area. Alternative 4 proposes the addition of approximately 145,000 square meters (1.6 million square feet) of new educational, office, research and development, museum, conference center, housing and retail space in the NRP area, as well as the demolition of approximately 52,000 square meters (560,000 square feet) of non-historic structures and the renovation of approximately 46,000 square meters (500,000 square feet) of existing space. Alternative 4 also proposes approximately 251,000 square meters (2.7 million square feet) of new office, research and development, laboratory, educational, and student/faculty housing development in the Bay View area. In the Eastside/Airfield area, Alternative 4 proposes approximately 62,000 square meters (670,000 square feet) of new light industrial, research and development, office and educational facility development, as well as the renovation of the historic hangars. The total build out under Alternative 4 would be approximately 940,000 square meters (10.1 million square feet).

— **Alternative 5: The Preferred Alternative.** Under Alternative 5, there would be some new construction in each of the four development areas, but it would be concentrated primarily in the NRP area. Alternative 5 proposes the addition of approximately 192,000 square meters (2.1 million square feet) of new educational, office, research and development, museum, conference center, housing and retail space in the NRP Area, as well as the demolition of approximately 52,000 square meters (560,000 square feet) of non-historic structures and the renovation of approximately 56,000 square meters (600,000 square feet) of existing space. It also proposes the addition of approximately 93,000 square meters (1 million square feet) of new development in the Bay View area, primarily for housing. In the Eastside/Airfield area, Alternative 5 proposes approximately 1,100 square meters (12,000 square feet) of new space in a new control tower. Finally, in the Ames Campus area, Alternative 5 includes the demolition of approximately 37,000 square meters (400,000 square feet) of existing buildings to make way for 46,000 square meters (500,000 square feet) of high density office and research and development space. Total build out under Alternative 5 would be approximately 777,000 square meters (8.4 million square feet).

— Under Mitigated Alternative 5, development would be the same as in Alternative 5 above, with several exceptions. A summary of these exceptions is provided in section C.5.d of this chapter. A full description and analysis is provided in Chapter 5 of this Final EIS.

A. Baseline

In this EIS, the "baseline" is defined as future conditions that will occur at Ames Research Center even if the NADP is not adopted and implemented. The baseline level of development assumed at Ames Research Center in this EIS consists of existing conditions at Ames Research Center plus new development already approved under two other environmental documents:

— The California Air National Guard 129th Rescue Wing, Moffett Federal Airfield Master Plan , 1998, recognizes 303,634 square feet of proposed and existing facilities in the Eastside Airfield.

— The 1994 Comprehensive Use Plan and its Environmental Assessment (CUP EA) comprised NASA's first plan for Moffett Field when it was acquired from the Navy. Under the CUP EA, NASA is now preparing to construct an advanced space research lab, related office and research development space, a temporary museum facility, and a childcare center. Approximately 33,000 square meters (350,000 square feet) of non-historic buildings will be demolished to make way for new buildings under the CUP EA. Additionally, approximately 10,500 square meters (113,000 square feet) will be remodeled and occupied by universities, the Ames Technology Commercialization Center (ATCC) and others.

  In total, the baseline includes approximately 534,000 square meters (5,749,000 square feet) of existing and new buildings, plus the CANG facilities, for a total of 561,000 square meters (6 million square feet).

1. Land Use

Development cleared under the CANG and CUP EAs will consist of the following elements:

— **The laboratory** will be a research facility focusing on advanced research in information technology, biotechnology and nanotechnology. This facility will include approximately 8,400 square meters (90,000 square feet) of research, office and administrative space, as well as a 2,800-square meter (30,000-square foot) auditorium for a total of 11,000 square meters (120,000 square feet).

— The development currently planned with **Lockheed Martin**, will consist of approximately 56,000 square meters (600,000 square feet) of office and research and development space.

Table 2-1 Baseline and Proposed Alternative Analysis Breakdown

Alternative One

	Site		Existing Facilities		Current Baseline Projects under the CUP and CANG EAs (FONSI)						Baseline Facilities		Proposed Projects under the EIS						Totals	Totals		
	Hectares	Acres	Existing (MS)	Existing (SF)	Demo (MS)	Demo (SF)	Reno (MS)	Reno (SF)	New (MS)	New (SF)	Existing (MS)	Existing (SF)	Demo (MS)	Demo (SF)	Reno (MS)	Reno (SF)	New (MS)	New (SF)	Total (MS)	Total (SF)	Net Change (MS)	Net Change (SF)
NASA Research Park	86.20	213.00	1 6,533	1,577,269	31,801	3 2,307	11,33	122,000	71,071	765,000	185,803	1,999,962	-	-	-	-	-	-	185,803	1,999 962	-	-
Eastside / Airfield	385.26	952.00	79,863	859,636	-	-	-	-	-	-	79,863	859,636	-	-	-	-	-	-	79,863	859 636	-	-
Bay View S te	38.2	9 .50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ames Campus	9 .70	23 .00	268, 58	2,889,658	1,115	12,000	-	-	1,115	12,000	268, 58	2,889,658	-	-	-	-	-	-	268, 58	2,889 658	-	
	60 . 0	1, 93.50	9 ,85	5,326,563	32,916	35 ,307	11,33	122,000	72,186	777,000	53 ,123	5,7 9,256	-	-	-	-	-	-	53 ,123	5,7 9 256	-	-
CANG EA *	.52	110.00	20,717	223,000	232	2,500	7	800	5,9 6	6 ,000	26, 31	28 ,500	-	-	-	-	-	-	26, 31	28 500	-	

Alternative Two

	Site		Existing Facilities		Current Baseline Projects under the CUP and CANG EAs (FONSI)						Baseline Facilities		Proposed Projects under the EIS						Totals	Totals		
	Hectares	Acres	Existing (MS)	Existing (SF)	Demo (MS)	Demo (SF)	Reno (MS)	Reno (SF)	New (MS)	New (SF)	Existing (MS)	Existing (SF)	Demo (MS)	Demo (SF)	Reno (MS)	Reno (SF)	New (MS)	New (SF)	Total (MS)	Total (SF)	Net Change (MS)	Net Change (SF)
NASA Research Park	86.20	213.00	1 6,533	1,577,269	31,801	3 2,307	11,33	122,000	71,071	765,000	185,803	1,999,962	52,209	561,972	6, 52	500,000	191,567	2,062,010	325,161	3,500 000	139,358	1,500,038
Eastside / Airfield	385.26	952.00	79,863	859,636	-	-	-	-	-	-	79,863	859,636	-	-	72,521	780,613	51,097	550,000	130,959	1, 09 636	51,097	550,000
Bay View S te	38.2	9 .50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	120,77	1,300,000	120,77	1,300 000	120,77	1,300,000
Ames Campus	9 .70	23 .00	268, 58	2,889,658	1,115	12,000	-	-	1,115	12,000	268, 58	2,889,658	-	-	6, 52	500,000	-	-	268, 58	2,889 658	-	-
	60 . 0	1, 93.50	9 ,85	5,326,563	32,916	35 ,307	11,33	122,000	72,186	777,000	53 ,123	5,7 9,256	52,209	561,972	165, 2	1,780,613	363, 38	3,912,010	8 5,352	9,099 29	311,229	3,350,038
CANG EA *	.52	110.00	20,717	223,000	232	2,500	7	800	5,9 6	6 ,000	26, 31	28 ,500	-	-	-	-	-	-	26, 31	28 500	-	

Alternative Three

	Site		Existing Facilities		Current Baseline Projects under the CUP and CANG EAs (FONSI)						Baseline Facilities		Proposed Projects under the EIS						Totals	Totals		
	Hectares	Acres	Existing (MS)	Existing (SF)	Demo (MS)	Demo (SF)	Reno (MS)	Reno (SF)	New (MS)	New (SF)	Existing (MS)	Existing (SF)	Demo (MS)	Demo (SF)	Reno (MS)	Reno (SF)	New (MS)	New (SF)	Total (MS)	Total (SF)	Net Change (MS)	Net Change (SF)
NASA Research Park	86.20	213.00	1 6,533	1,577,269	31,801	3 2,307	11,33	122,000	71,071	765,000	185,803	1,999,962	52,209	561,972	6, 52	500,000	28 , 70	3,062,010	18,06	,500 000	232,261	2,500,038
Eastside / Airfield	385.26	952.00	79,863	859,636	-	-	-	-	-	-	79,863	859,636	-	-	72,521	780,613	-	-	79,863	859 636	-	-
Bay View S te	38.2	9 .50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ames Campus	9 .70	23 .00	268, 58	2,889,658	1,115	12,000	-	-	1,115	12,000	268, 58	2,889,658	-	-	6, 52	500,000	-	-	268, 58	2,889 658	-	-
	60 . 0	1, 93.50	9 ,85	5,326,563	32,916	35 ,307	11,33	122,000	72,186	777,000	53 ,123	5,7 9,256	52,209	561,972	165, 2	1,780,613	28 , 70	3,062,010	766,385	8,2 9 29	232,261	2,500,038
CANG EA *	.52	110.00	20,717	223,000	232	2,500	7	800	5,9 6	6 ,000	26, 31	28 ,500	-	-	-	-	-	-	26, 31	28 500	-	

Alternative Four

	Site		Existing Facilities		Current Baseline Projects under the CUP and CANG EAs (FONSI)						Baseline Facilities		Proposed Projects under the EIS						Totals	Totals		
	Hectares	Acres	Existing (MS)	Existing (SF)	Demo (MS)	Demo (SF)	Reno (MS)	Reno (SF)	New (MS)	New (SF)	Existing (MS)	Existing (SF)	Demo (MS)	Demo (SF)	Reno (MS)	Reno (SF)	New (MS)	New (SF)	Total (MS)	Total (SF)	Net Change (MS)	Net Change (SF)
NASA Research Park	86.20	213.00	1 6,533	1,577,269	31,801	3 2,307	11,33	122,000	71,071	765,000	185,803	1,999,962	52,209	561,972	6, 52	500,000	1 5,115	1,562,010	278,709	3,000 000	92,907	1,000,038
Eastside / Airfield	385.26	952.00	79,863	859,636	-	-	-	-	-	-	79,863	859,636	-	-	72,521	780,613	62,2 5	670,000	1 2,108	1,529 636	62,2 5	670,000
Bay View S te	38.2	9 .50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	250,838	2,700,000	250,838	2,700 000	250,838	2,700,000
Ames Campus	9 .70	23 .00	268, 58	2,889,658	1,115	12,000	-	-	1,115	12,000	268, 58	2,889,658	-	-	139,355	1,500,000	-	-	268, 58	2,889 658	-	-
	60 . 0	1, 93.50	9 ,85	5,326,563	32,916	35 ,307	11,33	122,000	72,186	777,000	53 ,123	5,7 9,256	52,209	561,972	258,327	2,780,613	58,199	,932,010	9 0,113	10,119 29	05,990	,370,038
CANG EA *	.52	110.00	20,717	223,000	232	2,500	7	800	5,9 6	6 ,000	26, 31	28 ,500	-	-	-	-	-	-	26, 31	28 500	-	

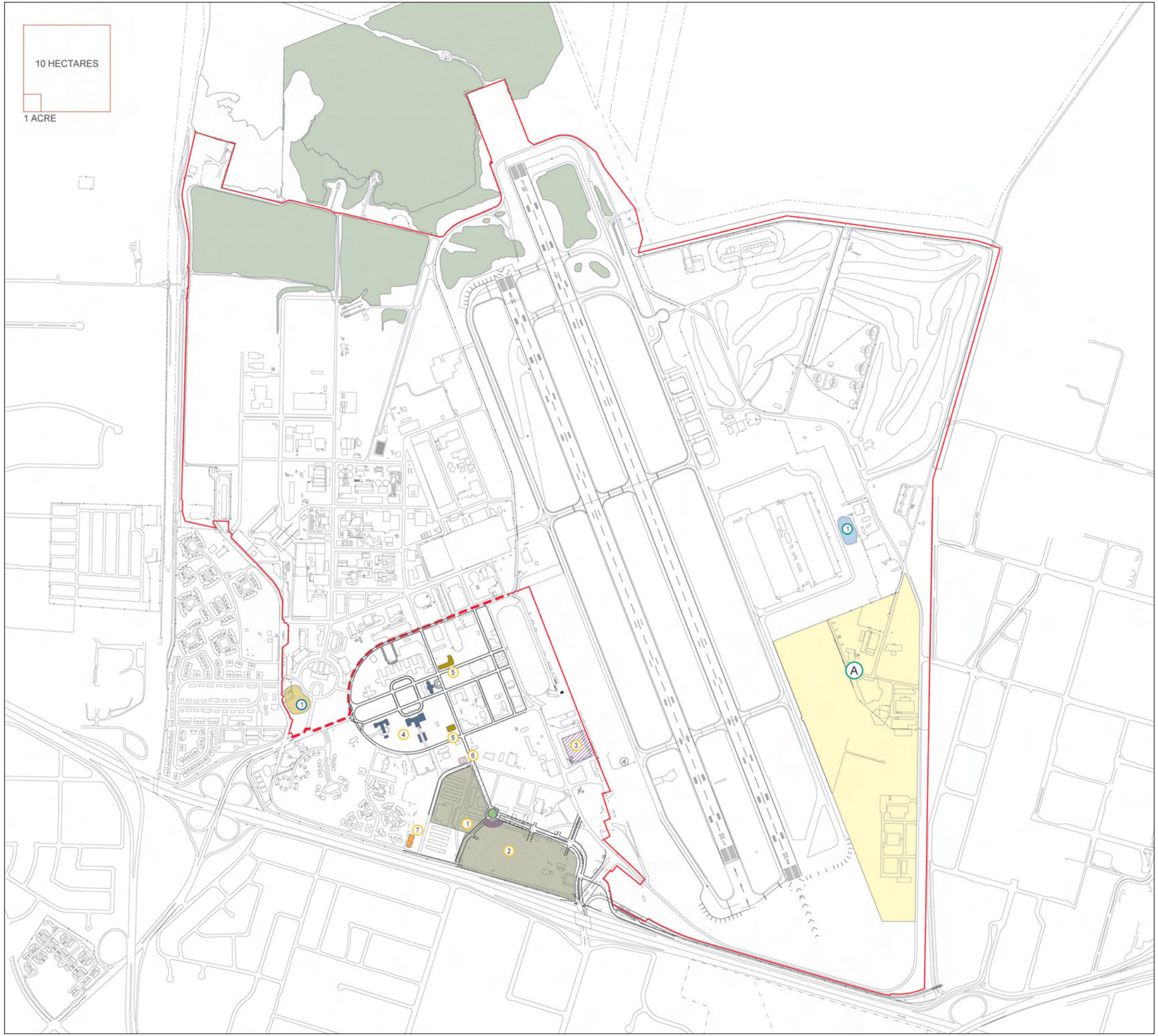
Alternative Five

	Site		Existing Facilities		Current Baseline Projects under the CUP and CANG EAs (FONSI)						Baseline Facilities		Proposed Projects under the EIS						Totals	Totals		
	Hectares	Acres	Existing (MS)	Existing (SF)	Demo (MS)	Demo (SF)	Reno (MS)	Reno (SF)	New (MS)	New (SF)	Existing (MS)	Existing (SF)	Demo (MS)	Demo (SF)	Reno (MS)	Reno (SF)	New (MS)	New (SF)	Total (MS)	Total (SF)	Net Change (MS)	Net Change (SF)
NASA Research Park	86.20	213.00	1 6,533	1,577,269	31,801	3 2,307	11,33	122,000	71,071	765,000	185,803	1,999,962	52,209	561,972	56,080	603,635	191,567	2,062,010	325,161	3,500 000	139,358	1,500,038
Eastside / Airfield	385.26	952.00	79,863	859,636	-	-	-	-	-	-	79,863	859,636	-	-	-		1,115	12,000	80,978	871 636	1,115	12,000
Bay View S te	38.2	9 .50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	92,903	1,000,000	92,903	1,000 000	92,903	1,000,000
Ames Campus	9 .70	23 .00	268, 58	2,889,658	1,115	12,000	-	-	1,115	12,000	268, 58	2,889,658	37,161	00,000	-	-	6, 52	500,000	277,7 8	2,989 658	9,290	100,000
	60 . 0	1, 93.50	9 ,85	5,326,563	32,916	35 ,307	11,33	122,000	72,186	777,000	53 ,123	5,7 9,256	89,370	961,972	56,080	603,635	332,036	3,57 ,010	776,790	8,361 29	2 2,666	2,612,038
CANG EA *	.52	110.00	20,717	223,000	232	2,500	7	800	5,9 6	6 ,000	26, 31	28 ,500	-	-	-	-	-	-	26, 31	28 500	-	-

* Preapproved pursuant to the CANG EA Master P an not included in to als

FIGURE 2.1

BASELINE LAND USE PLAN



LEGEND:

- Lab Project
- Historic District Renovation
- ARC **Childcare**
- ATCC Renovation
- Research / **Girvan**
- Computer Museum
- UCSC Offices
- Supporting Retail
- CANG
- TRW Vehicle Storage
- Open Space
- Wetlands
- Relocated Fence
- Existing Fence

Denotes Parcel Number as Noted on Table 2-2

- (1) Ames Campus
- (1) NASA Research Park
- (1) Eastside / Airfield

DMJMH+N EDAW

N

0 76m 152m 305m
0 250ft 500ft 1000ft

NASA AMES RESEARCH CENTER
NASA AMES DEVELOPMENT PLAN FINAL EIS

Table 2-2: Alternative 1 (Baseline) - Land Use Summar

Parcel		Land Use		Parcel Area	Parcel Area (AC)	FAR	Developable Area	Developable Area (SF)
Ames Campu	E	ARC Facilities		93.53	*230.92*	0.29	267,343	*2,877,658*
	1	ARC Childcare	*	1.25	*3.08*	0.09	1,115	*12,000*
		Sub Total		**94.8**	*234.0*		**268,458**	*2,889,658*
NASA Research Park	E	NRP Facilities		73.47	*181.5*	0.14	103,862	*1,117,962*
	1	Lab Project	*	3.36	*8.31*	N/A	11,148	*120,000*
	2	Lab Project	*	7.90	*19.53*	0.71	55,742	*600,000*
	3	CMHC Temp. Buildi	*	1.46	*3.61*	0.29	4,181	*45,000*
	4	Historic Dist Reno	*	N/A	*N/A*	N/A	8,268	*89,000*
	5	ATCC Building Renc	*	N/A	*N/A*	N/A	1,765	*19,000*
	6	UCSC Building Ren	*	N/A	*N/A*	N/A	465	*5,000*
	7	Research / Girvan	*	N/A	*N/A*	N/A	836	*9,000*
		Sub Total		**86.2**	*213.0*		**186,267**	*2,004,962*
Eastside / Airfield	E	ESAF Facilities		384.86	*951.00*	0.02	79,863	*859,636*
	1	TRW Vehicle	*	0.40	*1.00*	N/A	0	*0*
		Sub Total		**385.3**	*952.0*		**79,863**	*859,636*
	A	CANG	**					
Bay View	E	Bay View		38.24	*94.50*	N/A	0	*0*
		Sub Total		**38.2**	*94.5*		**0**	*0*
Total							**534,588**	########
	A	CANG	**	44.52	*110.00*	N/A	6,020	*64,800*
		Existing CANG		N/A	N/A	N/A	20,717	*223,000*

* *"Preapproved pursuant to the 1994 NASA/MFA Environmental Assessment - Comprehensive Use Plan"*

** *"Preapproved pursuant to the CANG EA Master Plan - Square footage not included in totals*

- The construction of a 1,100 square meter (12,000 square foot) **childcare center** in the Ames Campus, and of a 4,200 square meter (45,000 square foot) temporary building for the Computer History Museum.
- The **renovation** of approximately 8,000 square meters (89,000 square feet) of space in historic buildings within the NRP area, and renovation of approximately 2,200 square meters (24,000 square feet) of non-historic space in Buildings 555, 566 and 14.
- **Demolition** of 31,800 square meters (342,307 square feet) of non-historic buildings in the NRP area to make way for new buildings under the CUP EA, and of approximately 2,300 square meters (25,000 square feet) in two non-historic buildings as cleared under the CANG EA .
- The construction of a **new roadway** to serve the Laboratory and the Lockheed Martin Development. The Ellis Street entrance to Ames Research Center will be reconfigured to make it the main approach to the NRP area.
- **Relocation of the security fence** to an alignment along Clark Memorial Drive, Bushnell Road and Cody Road to open the NRP area to the public. This would require the closure of several existing driveways serving parking areas. In order to preserve security in the Eastside/Airfield area, a new gate will be constructed on Macon Road.
- **Relocation of the main gate** from Moffett Boulevard/Clark Memorial Drive to Arnold Avenue in order to provide secure access into the Ames Campus area. This would require the realignment and widening of Arnold Avenue, and the construction of a new gate on McCord Avenue north of Bushnell Road.
- The construction of approximately 5,900 square meters (64,000 square feet) of **new space to serve CANG** in a hangar and a small hazardous materials storage building.
- **Relocation of the CANG Motor Pool** from the NRP area to the Eastside/Airfield area to provide room for the lab project. This action was

cleared under the CANG EA, but would be taking place earlier than was described in that document.

— The granting of an **easement** for a future segment of the **Bay Trail** along Ames Research Center's northeastern border. In order for this easement to be safe for public use, the ordnance in the affected munitions bunkers would be relocated to existing bunkers within the golf course in the Eastside/Airfield area.

In addition, the relocation of the Commissary and Exchange buildings, which may be rebuilt as part of a separate project before development begins on their current sites, are assumed to be part of the baseline. This new development would only occur after the Department of Defense prepares separate NEPA documentation prior to construction of a new Commissary and Exchange. The shift in trip distribution as a result of the proposed new location is included in the traffic analysis of the baseline in this EIS.

The authorized population at Ames Research Center under the CUP EA is 10,610.

Under baseline conditions, there will be no new housing units constructed. As in the proposed project, the airfield will continue to be restricted to government use, with no cargo, general aviation, or commercial uses allowed.

2. Open Space

Under baseline conditions, the central green in Shenandoah Plaza and the existing burrowing owl habitat will be preserved. Approximately 4.2 hectares (10.3 acres) of athletic fields abutting Highway 101 will be removed to allow the development of the Laboratory and Lockheed Martin Development under the CUP EA, described above. The southeastern portion of the Eastside/Airfield area will be developed for use by CANG under the CANG EA, described above. There will be no impacts on any of the existing open spaces within the Ames Campus and Bay View areas. The swimming pool and

gymnasium in the NRP area will be retained. NASA will grant an easement for a future segment of the Bay Trail along ARC's northern border.

3. Security and Circulation

As described above, in order to enable public access to the new development under the CUP EA the baseline includes moving the security fence to the outer edges of the NRP area. The Ellis Street gate area will be reconfigured to make it the primary entrance to the NRP area, and a new gate constructed on Macon Road to provide secure access to the Eastside/Airfield area. A new roadway will be constructed to link the Laboratory and Lockheed Martin Development to the Ellis Street entrance. In addition, the existing gate at Moffett Boulevard/Clark Memorial Drive would be relocated to Arnold Avenue in order to provide secure access into the Ames Campus area. This would require the realignment and widening of Arnold Avenue, and the construction of a new gate on McCord Avenue north of Bushnell Road.

The current TDM program at Ames Research Center will be maintained and expanded to include the new development under the CUP EA. This program includes flexible work hours, preferential carpool parking, subsidies for public transportation for federal employees, bike lockers, free bicycles for internal use by employees, and an internal shuttle that also serves the Caltrain station.

4. Infrastructure

Utility infrastructure will be installed under baseline conditions to serve new development that will occur within the NRP under the CUP EA. In general, all existing utility systems within the development area will be replaced with new systems that follow the baseline street layout.

— **Water.** A new connection to the existing main line at Tyrella Street will be installed and a system of water mains extended throughout the southern portion of the NRP area. To provide a looped system, a second connection will be made by extending a main south of the airfield to the existing high pressure line at the southeast corner of the Ames Research

Center. A 3.2 mega-liter (850,000 gallon) storage tank will be installed in the NRP as an emergency water supply.

— **Reclaimed Water.** A new connection to the existing reclaimed water line at the southeast corner of the Ames Research Center will be installed and a system of reclaimed water mains extended throughout the southern portion of the NRP area.

— **Sanitary Sewer.** The collection system will drain to the north toward Shenandoah Plaza. A main will be installed in Wescoat Court to intercept the flow and direct it east toward the utility corridor that will run north along the western edge of the airfield. This line will terminate at the proposed sewer pump station located northeast of Hangar 1. The pump station will discharge into the existing gravity line that crosses the airfield, which will be converted to a force main by lining the existing pipe. The force main will discharge to the pump station located near the golf course, which discharges to the Sunnyvale system.

— **Storm Drainage.** The collection system will drain to the north toward Shenandoah Plaza. A main will be installed in Wescoat Court to intercept the flow and direct it east toward the utility corridor that will run north along the western edge of the airfield. Storm runoff will eventually discharge into a new settling basin adjacent to the existing settling basin north of Ames Campus. Both settling basins drain to the existing retention pond, from which storm water is evaporated, or can be pumped into Stevens Creek if required to maintain adequate storage capacity.

— **Electrical Service.** The feeder from the ARC substation to Switchgear C (Building 590 in NRP) will be upgraded to become the main source of power to that switchgear. The feeders from the Airfield substation to Switchgear C will provide backup power.

— **Natural Gas Service.** The existing connection adjacent to Highway 101 will be maintained. A new distribution system of natural gas piping will be installed.

B. Components in the Alternatives

There are a number of new development projects included in some or all of the proposed alternatives. They are described here in detail, and the relevant descriptions are referenced in the discussion of each alternative that is included in Section C, below. Not all of these components are included in each alternative.

1. Land Uses and Facilities

The alternatives each include some or all of the following land uses and new facilities. Employment and population projection factors for each type of land use are shown in Table 2-3.

a. Educational Uses

A key component of proposed development at Ames Research Center is educational space to be shared by a number of different educational users. Based on the preliminary program submitted by one of these potential users, UC Santa Cruz, the program for this educational space would likely be approximately 42 percent office space, 50 percent high density classroom space, and 8 percent low density classroom space. NASA is currently planning with the following institutions:

- **UC Santa Cruz**. UC Santa Cruz has proposed a new regional education center to promote collaborative research with NASA/Ames personnel.
- **Carnegie-Mellon University**. Carnegie Mellon University would construct a West Coast campus that would focus on high dependability computing and collaboration with staff at Ames Research Center, other universities, and Silicon Valley companies.
- **San José State University.** This state university proposes on-site research and educational collaboration.
- **Foothill DeAnza College.** This regional community college plans to participate in the educational collaborative.

— **National Association for Equal Opportunity in Higher Education (NAFEO).** NAFEO is an association that advocates on behalf of historically Black colleges and universities, as well as Hispanic-serving institutions and Tribal colleges and universities. The organization's primary mission is "to articulate the need for a system of higher education where race, ethnicity, socio-economic status and previous educational attainment levels are not determinants of either the quantity or quality of higher education." Under the NASA Ames Development Plan, NAFEO is exploring the feasibility of establishing a Silicon Valley presence at Ames Research Center to expand educational and research opportunities for minority students and faculty from its member institutions, while working in partnership with ARC.

— **The National Center for Women in Science, Technology, Engineering and Mathematics.** The mission of this non-profit organization is "to increase the reach and effectiveness of organizations and individuals seeking to advance women and girls in science, technology, engineering and mathematics." This organization proposes to establish a national resource center in the NRP, and to create collaborative programs with NASA that would expand the representation of women in the technical and scientific workforce.

Employee projection factors for educational uses used in this EIS were derived from conversations with the University of California San Francisco (UCSF) Campus Planning Office and the UCSF Mission Bay Campus Environmental Impact Report (EIR). UCSF Mission Bay is a comparable project because its shared-use program resembles the NRP plan. The UCSF Campus Planning Office reports that the UCSF Mission Bay campus plan meets or exceeds the industry standard for employee densities in educational and research facilities, and is an improvement over current UCSF facilities.

TABLE 2-3: **POPULATION AND EMPLOYMENT PROJECTION FACTORS**

POPULATION DENSITIES

Land Use	**Population Density**
Student Apartments & Dorms	2 persons per unit
Townhomes & Apartments	2.99 persons per unit (a)
Conference Guest Rooms	1 bed per room; 1 person per bed

EMPLOYMENT PROJECTION FACTOR

Land Use	**Employment Projection Factor** (b)	**Data Source**
Office/HD R&D	26 square meters (279 gross square feet) per employee	ITE code 750
LD R&D/ Indust	38 square meters (405 gross square feet) per employee	ITE code 760
University		
High Density Classroom	17 square meters (188 gross square feet) per employee	Mission Bay EIR
Office	26 square meters (279 gross square feet) per employee	ITE code 750
Low Density Classroom (c)	0 square meters (0 gross square feet) per employee	Mission Bay EIR
Public/ Museum (d)	115 staff per million annual visitors	USAF Museum, Dayton, OH
Conf/ Training	1 employee per room	Fort Baker EIS
Retail		
Standard Retail	46 square meters (500 gross square feet) per employee	ITE code 814
Other Support Space (e)	36 square meters (390 gross square feet) per employee	See footnote (e)
Recreation (f)	58 square meters (625 gross square feet) per employee	See footnote (f)
Support (g)	46 square meters (500 gross square feet) per employee	See footnote (g)

Notes:

(a) 2015 Persons per Household in Santa Clara County, ABAG.

(b) The density factors account for both full-time and part-time workers.

(c) UCSF Campus Planning states that classrooms do not generate significant employees.

(d) The complex and unique nature of the proposed museum space prohibits the use of square footage to project employees. Instead, the USAF Museum in Dayton, OH was used as a proxy to project daily staff. The USAF museum has a similar program and a comparable number of annual visitors. NASA estimates 1 million annual visitors to the museum space, while the USAF Museum sees 1.2 million visitors a year.

(e) Includes a variety of uses including student meeting rooms and other community services. Employee Projection Factor is an average of Office/HD R&D and Standard Retail.

(f) Primarily includes health club facilities. Calls to comparable Bay Area health clubs were made to determine average employment density.

(g) Primarily includes child care space. Projection factor is function of legally mandated area per child (35 indoor sqft/child; another 15 sqft for non usable indoor space was added) and legally mandated staff to child ratio (average of 10 to 1).

Sources: Institute of Transportation Engineers, Trip Generation, 5th ed.; University of California, San Francisco; National Park Service, Fort Baker Final Environmental Impact Statement, 1999; Claritas, Inc.; USAF Museum; Association of Bay Area Governments, Projections 2000; National Child Care Information Center; Department of Social Services; Bay Area Economics, 2001.

— **National Association for Equal Opportunity in Higher Education (NAFEO).** NAFEO is an association that advocates on behalf of historically Black colleges and universities, as well as Hispanic-serving institutions and Tribal colleges and universities. The organization's primary mission is "to articulate the need for a system of higher education where race, ethnicity, socio-economic status and previous educational attainment levels are not determinants of either the quantity or quality of higher education." Under the NASA Ames Development Plan, NAFEO is exploring the feasibility of establishing a Silicon Valley presence at Ames Research Center to expand educational and research opportunities for minority students and faculty from its member institutions, while working in partnership with ARC.

— **The National Center for Women in Science, Technology, Engineering and Mathematics.** The mission of this non-profit organization is "to increase the reach and effectiveness of organizations and individuals seeking to advance women and girls in science, technology, engineering and mathematics." This organization proposes to establish a national resource center in the NRP, and to create collaborative programs with NASA that would expand the representation of women in the technical and scientific workforce.

Employee projection factors for educational uses used in this EIS were derived from conversations with the University of California San Francisco (UCSF) Campus Planning Office and the UCSF Mission Bay Campus Environmental Impact Report (EIR). UCSF Mission Bay is a comparable project because its shared-use program resembles the NRP plan. The UCSF Campus Planning Office reports that the UCSF Mission Bay campus plan meets or exceeds the industry standard for employee densities in educational and research facilities, and is an improvement over current UCSF facilities.

b. Museums

Two museums would be constructed on the site under several of the alternatives:

— **The Computer History Museum** would be an educational museum with exhibits on the development of computing. It is currently housed at a temporary facility within Ames Research Center, but would be moved to its own 7,400-square meter (80,000-square foot) building located in the NRP area. Its collection and archives are a resource for scholars, educators, engineers and journalists researching the history of computing. Exhibits cover both computing history and cutting edge developments from Silicon Valley and research at Ames Research Center itself. The new Computer History Museum facility would include exhibition, office and administration, library, and storage and archive space. Projected attendance is 50,000 people per year, with some additional visitorship linked to visitorship to the California Air and Space Center, which is described below.

— Historic Hangar 1 in the NRP area would be converted into the **California Air and Space Center** (CASC), an educational facility and museum on the history and future of the development of aerospace technology. This facility would include exhibit space; an IMAX Theater; facilities for meetings, conferences, and educational activities; office and administration uses; and visitor support space such as ticket booths, retail, etc. Projected attendance is approximately 1 million people per year.

  Due to the CASC's complex space requirements, the number of annual museum visitors, rather than square meters (square feet) per employee, is used to estimate employment. A ratio of annual visitors to daily staff was developed using data from the United States Air Force (USAF) Museum in Dayton, Ohio. The USAF Museum has a similar size and program as proposed for the CASC, and receives approximately 1.2 million visitors annually.

c. Office and High Density Research and Development Uses

Alternatives 2 through 5 include space for office and high density research and development uses to promote collaborative research between Ames Research Center and non-profit organizations, private companies, and educational institutions on topics related to NASA's Space Act mission. This development

would have approximately 3.6 employees per 93 square meters (1,000 square feet).[1]

d. Low-Density Research and Development and Light Industrial Uses

Another component of the alternatives is the renovation or development of space for low-density research and development and light industrial users. This use would occur in Hangars Two and Three in Alternatives 2, 3 and 4, and in other areas where appropriate.

This development would have approximately 2.5 employees per 93 square meters (1,000 square feet).[2]

e. Housing

For planning purposes, two types of housing are assumed in the alternatives. The first type includes 75-square meter (800-square foot) student apartments and dormitory units that are assumed to accommodate two people per unit. It is anticipated that these units will be used primarily by students associated with the NADP university partners and students working on the Ames Campus or Eastside/Airfield. The second type of housing includes 110-square meter (1,200-square foot) townhome and apartment units. These are assumed to accommodate 2.99 residents per unit, the projected number of residents per unit in Santa Clara County in 2015 according to ABAG. These units are intended to serve on-site employees. The intent of NADP housing is to provide housing for people who work or go to school on-site in order to alleviate the jobs/housing imbalance in the region and reduce rush hour traffic.

f. NRP Conference Center

This 180 - 250-room facility would provide temporary lodging and meeting space within the NRP area. It would be shared by NASA, the universities, and

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[1] Employee density data from Institute of Transportation Engineers (ITE) *Trip Generation*, 5th Edition.

[2] *Ibid.*

other tenants at Ames Research Center, and be available for other users as well. The number of rooms and the amount of space dedicated to meeting and presentation rooms varies under different alternatives. In addition to lodging and meeting rooms, the conference center could include other amenities such as restaurants and a gym.

For the Conference Center, the number of rooms is used to project employees, at a rate of one employee per room. This method corresponds with the employee projection method used by the National Parks Association in the Fort Baker Conference Center Final Environmental Impact Statement. This is a relatively conservative assumption. The UCSF Mission Bay EIR, for example, assumes a density of 0.74 employees per room in its employee forecasts for a hotel use.

g. Emergency Training Center

Alternatives 2 through 4 each include a regional disaster training facility in the Eastside/Airfield area. This 7,400-square meter (80,000-square foot) facility, called the Regional Disaster Training Facility, would include a number of training environments and a small amount of administrative space.

h. Control Tower

Under Alternatives 2 through 5, the existing control tower within the NRP area would be removed and a new 1,100 square meter (12,000 square foot) facility would be constructed in the Eastside/Airfield area.

i. Supporting Retail and Other Services

Each of the alternatives includes some space for Standard Retail businesses to serve people living and working on-site, such as cafes, copy shops, and dry cleaners. The alternatives also include space for needed community facilities, such as day care, banking, a health club and community centers.

Due to the diversity of potential uses under this category, the average employment projection factor of Office/High-Density R&D and Standard Retail from ITE's *Trip Generation* is used to estimate employment in most of

these uses. Comparable Bay Area health clubs were contacted to develop an appropriate employment projection factor for the health club. Two factors were used to determine the number of employees generated by the NRP child care facility: state laws setting minimum amounts of space per child as well as those regulating staff-to-child ratios. Licensed child care facilities are required to provide 3 square meters (35 square feet) indoor space per child. For the purposes of this analysis, an additional 1.5 square meters (15 square feet) of non-usable indoor space per child (e.g. hallways, bathrooms, administrative offices, maintenance and storage rooms) was added to the calculation. The minimum staff to child ratio at licensed child care centers varies according to the age of the children. An average of 10 children per staff member was used for this analysis.

2. Other Program Components

In addition to the uses and facilities listed above, some or all of the alternatives include the following programmatic components:

a. Sustainability

Sustainable development can be defined as development that meets the needs of the present without compromising the ability of future generations to meet their needs. NASA is committed to the notion that the NADP will be a model for sustainable development.

One of the cornerstones of sustainable development is conscientious management of potential traffic impacts, since traffic impacts lead to increased concentration of localized carbon monoxide and overall emissions of ozone precursors. In addition, increased idling time wastes precious fossil fuels. Alternatives 2 through 5 all include adherence to an aggressive TDM program as described in section h, below, and in Sections 3.3 and 4.3. Adherence to the TDM program is projected to decrease single-occupant vehicle trips by 22 per cent. Traffic impacts, such as decreased Levels of Service and increased idling time, would be lessened, reducing fossil fuel consumption and impacts to air quality.

The proposed project also includes on-site housing and pedestrian-oriented development, thereby reducing vehicle trips by locating jobs and housing in close proximity to one another and encouraging alternative modes of transportation such as walking or bicycling. Additionally, all of the major roadway segments within the NRP area would include Class II bicycle lanes and bicycle parking facilities including racks and/or lockers would be provided, as discussed in Sections 3.12 and 4.12.

The NADP encourages water conservation by requiring low flow fixtures, minimizing landscaping and maximizing the use of California native plants which are adapted to the Bay Area climate and hence require less water and maintenance than non-native species. In addition, the NADP includes use of reclaimed water which could serve the ARC for irrigation purposes. This is discussed further in Sections 3.5 and 4.5.

The Design Guide for the NADP outlines techniques for constructing energy-efficient buildings. The project buildings, as proposed, are 10 per cent more energy efficient than Title 24 standards. Title 24 is the state law requiring energy conservation. All buildings would, at a minimum, meet LEED certification standards, and obtain LEED certification.

The NADP includes preservation of habitat for the Burrowing Owl as part of all five of the alternatives. The inclusion of the Burrowing Owl Habitat Management Plan (BOHMP) means the preservation of 50-80 acres of land for burrowing owl nesting and foraging which would avoid most of the potential long-term impacts on burrowing owl nesting habitats as discussed in Sections 3.9 and 4.9.

The NASA Ames Research Center is committed to recycling and the reduction of solid and hazardous wastes, and has recycling and composting programs in place to reduce its wastes. These programs undergo continual improvements to increase on-site and off-site recycling opportunities and to reduce the quantity of wastes disposed.

b. Site Access Modifications

The development proposed under the NADP would result in changes to the internal roadway system. In some cases these changes would include new or realigned roadways designed to better serve the proposed land uses in the four planning areas. In other cases, changes would be required to meet security needs. While the exact nature of these changes will be a function of the final development plan, those expected to occur include relocation of the security fence to allow public access into the Bay View area while still providing security to the Ames Campus and Eastside/Airfield areas. Operations at Gate 17 east of R.T. Jones Road and the 5th Street (East) Gate are expected to remain unchanged in terms of operation and vehicle capacity.

c. Roadway Reconstruction

The proposed on-site roadway system for each alternative has been designed to accommodate both projected daily and peak hour traffic volumes. Within the NRP area, roads would be re-configured from one-way to two-way and widened and relocated in some cases to provide more direct travel routes. Certain segments providing connections to parking lots and structures would include limited driveway access and additional lanes to increase capacity. However, the overall roadway layout is designed to provide a clear hierarchy of roadways, minimize traffic volumes at key locations, encourage the use of other travel modes (public transit, bicycling, and walking), provide on-street parking where appropriate, and limit travel speeds through the developed portion of the NRP area. While the majority of the traffic generated by new land uses in the NRP area is expected to use Ellis Street interchange because of its proximity, some vehicles would use the Moffett Boulevard entrance. This activity is expected to result in increased traffic volumes on Clark Memorial Drive, Wescoat Court, McCord Avenue and North Akron Road. However, the project does not propose widening of any of these streets within the Shenandoah Plaza Historic District area.

In the Bay View and the Eastside/ Airfield areas, roads adjacent to new building construction are expected to be designed with standard lane widths and traffic control devices. The City of Mountain View may install a connecting

vehicular bridge at Charleston (see Section 4.3). New sidewalks would be installed as needed to provide adequate pedestrian connections within each area. On-street parking would be provided using the same design guidelines and standards that have been established for the NRP area.

No changes are anticipated to the road system in the Ames Campus area. The street system is expected to remain the same except at intersections with roadways in the NRP, where slight changes to traffic control may be required. None of these changes is expected to substantially affect operations.

d. Changes to Bicycle/Pedestrian Circulation

All of the major roadway segments within the NRP area, including Moffett Boulevard, Ellis Street, Cody Road and Manila Drive, and several minor roadway segments (Ellis Street Extension, McCord Avenue Extension) would include Class II bicycle lanes. Several off-street multi-use paths are also planned within the NRP area. Bicycle parking including racks and/or lockers would be provided throughout the NRP, Bay View, and East Airfield areas to encourage the use of bicycles.

Pedestrian circulation throughout Ames Research Center would be greatly enhanced, especially in the NRP area, by the provision of sidewalks on both sides of all new streets. A new sidewalk is also proposed for the south side of Wescoat Court. Numerous internal pedestrian connections would be provided within each parcel. In designing these facilities and working to improve bicycle access, NASA and its partners would consult with VTA and and local bicycle and pedestrian advisory commitees.

e. Infrastructure Improvements

Utility infrastructure that would be installed under each of the four action alternatives within the southern portion of the NRP area would tie into and extend the baseline infrastructure systems installed under baseline conditions. In general, all existing utility systems within the NRP south of Shenandoah Plaza would be replaced with new systems that follow the street layout. Utility systems within Shenandoah Plaza, the Eastside/Airfield are and the Bay

View (for Alternatives 2, 4 and 5 only) would be essentially independent of baseline infrastructure, although certain interconnections would be provided.

— **Water.** For Shenandoah Plaza, existing mains would be replaced as required to enable the system to operate at the same pressure as the rest of the NRP. For Eastside/Airfield area, a new connection to the existing high pressure system (designed to provide fire protection for Hangars 2 and 3) would be installed. Distribution systems would be installed for all areas.

  Under Alternatives 2, 4 and 5, a 3.0 mega-liter (800,000 gallon) storage tank would be installed in Bay View as an emergency water supply. A new connection to the existing high pressure water main would be installed near the main gate in the Bay View. A main would be extended north into the Bay View area, east toward the airfield, and then south in the proposed utility corridor that runs along the west edge of the airfield, to provide a second connection and a looped system in Bay View.

— **Reclaimed Water.** The reclaimed water system in Shenandoah Plaza would tie into and extend the system installed in the southern portion of the NRP. The Bay View system would also tie into the NRP via the utility corridor that runs along the west edge of the airfield. The golf course would be irrigated with reclaimed water under all alternatives, using a connection to the existing reclaimed water main in the Eastside/Airfield area. A second new connection to the existing main would be installed in Alternatives 2 and 4 to irrigate landscaping in the Eastside/Airfield area.

— **Sanitary Sewer.** For Shenandoah Plaza, existing mains would be replaced as required and the collection system would drain to the pump station located northeast of Hangar 1. The rest of NRP would also drain to this pump station, which discharges to the pump station located near the golf course. The collection system in the Eastside/Airfield area would continue to drain to the pump station located near the golf course, which discharges to the Sunnyvale system.

  Under Alternatives 2, 4 and 5, the Bay View system would drain to the existing gravity main that flows north through Ames Research Center and discharges to the Mountain View system.

— **Storm Drainage.** For Shenandoah Plaza, existing mains would be replaced as required and the collection system would drain to a main that would run north along the western edge of the airfield. Storm runoff from all of NRP would eventually discharge into one of two settling basins north of Ames Campus. The second settling basin is the terminus of the Ames Campus system. Both settling basins drain to the existing retention pond, from which storm water is evaporated, or can be pumped into Stevens Creek if required to maintain adequate storage capacity. The collection system in Eastside/Airfield area would continue to drain to the lift station located near the golf course, which discharges into the Northern Channel.

  The conceptual plan for the storm drain system to reduce off-site flows and pollutant loading has been revised in this Final Programmatic EIS. In Bay View, stormwater would be retained on-site in recreational areas, then flow through swales to a settling basin. From there, it would move on to the Eastern Diked Marsh and then to the sotrmwater retention pond, thereby eliminating the need to route water directly to Stevens Creek. In addition, there have been changes to the design of the NASA Research Park storm system to slow drainage flows to the stormwater retention pond.

— **Electrical Service.** The distribution system from Switchgear C (Building 590 in NRP) would be extended to serve all of NRP. New switchgears would be installed in Shenandoah Plaza and Bay View(under Alternatives 2, 4 and 5) to serve those areas. NRP and Bay View (under Alternatives 2, 4 and 5) would be fed from the ARC substation. Eastside/Airfield area would continue to be fed from the Airfield substation.

— **Natural Gas Service.** The distribution system in Shenandoah Plaza would be upgraded as required and tied in to the rest of NRP, which would be served from the existing connection adjacent to Highway 101. New connections and distribution systems would be installed in Bay View (under Alternatives 2, 4 and 5) and Eastside/Airfield.

f. Modifications to Outdoor Aerodynamic Research Facility Operations

Under Alternatives 2, 4 and 5, the Outdoor Aerodynamic Research Facility (OARF) in the Bay View area would remain in place with limitations on its use to minimize potential impacts on proposed housing and other facilities.

g. Fill in the Bay View Area

In order to allow for development of the Bay View area, the existing grade in the housing area would need to be raised by 0.2 to 1.4 meters (0.5 to 4.5 feet). This would require a total of approximately 123,000 cubic meters (160,000 cubic yards) of imported soil, which would be brought to the site by truck. Assuming double bottom dumper trucks with an average capacity of approximately 10 cubic meters (13 cubic yards), a total of approximately 12,300 truck trips would be needed. NASA or its partners would establish detailed construction traffic plans, including truck trips and haul routes, prior to large scale fill operations.

h. Transportation Demand Management Program

Under Alternatives 2 through 5, an aggressive TDM program would be implemented in the NRP and Bay View development areas in order to reduce single occupant vehicle trips generated by 22 percent. Additional trip reduction would be achieved through the provision of on-site housing. The TDM program would apply to all lessees, tenants, and partners located in buildings within the NRP and Bay View areas, as defined by the TDM Plan.

The TDM program , combined with the on-site housing, would be designed to produce a vehicle trip generation rate of 58 cars per 100 NRP/Bay View employees and students at project build-out. This compares to a vehicle trip generation rate of 86 cars per 100 employees among Santa Clara employees working at sites that do not provide TDM programs (source: Commute Profile 2000, RIDES for Bay Area Commuters). This is a net trip reduction of 32 percent (86 vs. 58). The walk, bike, shuttle trips attributed to the presence of on-site housing represent a 10 percent net trip reduction, while the walk, bike, shuttle, transit, carpool and vanpool trips attributed to the TDM program described below represent a 22 percent net trip reduction. The two factors

combined represent the overall 32 percent net trip reduction. Table 2-4 shows the effective percentage of TDM and housing reductions by alternative and time period.

A conceptual TDM program, designed to meet the above-quantified objectives, is detailed in Appendix B of this EIS. It includes the following key components:

- A paid parking program would be instituted throughout the NRP and Bay View area, such that all uses would be required to either pass parking charges along to their employees or offer parking cash-out programs.
- The internal shuttle program would be significantly expanded to meet the needs of the new development. Shuttle routes would provide service to the Ellis Street VTA station, and to Caltrain, meeting most trains throughout the day.
- A NRP Transportation Management Association (TMA) would be formed. All partners, lessees and tenants of the NRP and Bay View would be required to pay membership fees to support the NRP TMA. The TMA would implement and manage site-wide transportation demand management systems.
- Employees and students located in the NRP area would receive EcoPasses or another transit subsidy.
- The existing on-site bicycle network would be expanded.
- Through the shared parking program, the TMA would provide preferential parking for car pools. The TMA would also institute a guaranteed ride home program for people using public transit, car pools or van pools.
- An on-site car-share program would be provided to allow students to have access to cars on weekends and evenings, and to allow employees access to cars for business travel during the workday. The car-share vehicles would also be used by dedicated carpoolers for commute purposes and as Guaranteed Ride Home program vehicles.

- A combination of on-site amenities such as bank machines, post boxes, a concierge service, child care, a fitness center, recreation fields, and restaurants would be provided. This minimizes the need for mid-day trips among those who do choose to commute via automobile , and also increase the ability for people to use alternative modes to commute to the site, since a car is not necessarily needed mid-day.
- A fleet of on-site bicycles, including some electric bikes, would be provided to facilitate travel between the light rail station and the NRP, as well as throughout the NRP.
- A comprehensive marketing program would be provided.

As part of Alternatives 2 through 5, NASA and its partners would commit to implementing this or a similar TDM program that meets the quantified objectives presented at the beginning of this section h. Attainment of AVR goals at each phase of development would be required before development could proceed.

i. Burrowing Owl Habitat Management Plan

NASA has committed to include protection of burrowing owl habitat in all five development alternatives. NASA would place a Habitat Conservation Easement over the burrowing owl preserves. Dr. Lynne Trulio, a biologist who studies the burrowing owl population at Ames Research Center, prepared a Burrowing Owl Habitat Management Plan (BOHMP) that has been integrated into each of the alternatives. The full Plan is included in Appendix E, under separate cover. The following discussion summarizes its main points.

TABLE 2-4: **TDM AND HOUSING TRIP REDUCTIONS**

Daily Trips	Westside		Eastside/Airfield	
	TDM	Housing	TDM	Housing
Alternative 1	4.5%	N/A	N/A	N/A
Alternative 2	22.3%	17.3%	5.5%	7.7%
Alternative 3	23.6%	14.6%	5.6%	6.5%
Alternative 4	21.5%	17.1%	5.5%	8.1%
Alternative 5	20.0%	26.3%	N/A	N/A
Mitigated Alternative 5	16.5%	39.0%	N/A	N/A
AM Peak Hour				
Alternative 1	4.5%	N/A	N/A	N/A
Alternative 2	20.0%	32.8%	4.7%	22.2%
Alternative 3	21.9%	28.2%	5.1%	14.6%
Alternative 4	19.3%	30.5%	4.8%	20.7%
Alternative 5	15.6%	52.7%	N/A	N/A
Mitigated Alternative 5	8.4%	80.9%	N/A	N/A
PM Peak Hour				
Alternative 1	4.5%	N/A	N/A	N/A
Alternative 2	19.2%	32.2%	4.4%	26.6%
Alternative 3	21.0%	25.1%	5.0%	17.3%
Alternative 4	18.6%	30.2%	4.5%	24.9%
Alternative 5	15.1%	49.5%	N/A	N/A
Mitigated Alternative 5	8.5%	75.7%	N/A	N/A

Notes:
N/A = Not applicable because the indicated use would not be built.
Percentages represent the proportion compared to gross trip generation.
The variation in the net TDM reduction is caused by the fact that the housing reduction is taken first. The housing reduction varies because the amount and type of housing varies among alternatives. Next, a TDM reduction of 22 percent is applied to the net external trips (gross trips less the housing reduction). Thus, the higher the housing-related reduction, the lower the TDM percentage.
* See Section 5.3 for more information on Mitigated Alternative 5 reductions.
Source: Fehr and Peers Associates.

The BOHMP describes potential impacts from the proposed development alternatives, and lays out measures to avoid or mitigate them. The key provision of the BOHMP is the creation of burrowing owl preserves. The alternatives vary somewhat in the size of the preserves they set aside for burrowing owls. In the BOHMP, Dr. Trulio and NASA staff selected a 9-hectare (22-acre) area in NRP, a 3-hectare (8-acre) site in the Ames Campus area, a 10-hectare (24-acre) area in Eastside/Airfield, and an 11-hectare (27-acre) area in Bay View. The preserve within the Ames Campus area is smaller than the others because that planning area is mostly built out. Together, the four preserves set aside approximately 33 hectares (81 acres) for burrowing owl nesting and foraging. According to the BOHMP, NASA would avoid most of the potentially significant long-term impacts on burrowing owl nesting habitat by establishing these preserves and steering development away from them.[3]

However, even with the establishment of the preserves there could be some impacts on burrowing owls from implementation of the NADP. The BOHMP thus includes mitigation measures to address these impacts, which are described in more detail in Section 4.9 of this EIS. The mitigation measures are designed to address loss of burrows during construction, loss of habitat due to new development, disturbance of existing burrows, increased vehicle collisions, control of ground squirrels, decreased prey base, and increased predation. Taken together, the avoidance mitigation measures described in Section 4.9 are expected to achieve long-term protection of the existing burrowing owl colony at the Center given the proposed NASA Ames Development.

j. Stormwater Pollution Prevention Best Management Practices

Best Management Practices (BMPs) are techniques used in various land use activities to mitigate or prevent harm to or inhibition of natural attributes or processes. NASA Ames would incorporate several sets of BMPs into the buildout process for the NADP. Each is described in more detail below.

[3] *NASA ARC Burrowing Owl Habitat Management Plan*, p. 15.

i. BMPs for Construction, Demolition and Excavation Operations

The first set of BMPs are applicable to all construction, demolition and excavation activities at Ames Research Center that could potentially release pollutants to stormwater. Construction, demolition and excavation projects generate a great deal of dust, debris, waste materials and wastewaters that when improperly managed can result in prohibited discharges to the storm drainage system. At Ames, all contractor specifications require a Storm Water Pollution Prevention Plan. Furthermore, the California Storm Water Best Management Practice Handbook for Construction Activity is made available to construction contractors working at Ames.

Construction, demolition and excavation BMPs would include the following:

- Inlet protection for all inlets draining constructions areas.
- Silt fencing and/or fiber rolls to prevent sediment from leaving the site in storm runoff.
- Covering stockpiled material and directing storm runoff around stockpiles.
- Designated wash down areas to remove excess soil from equipment prior to leaving the site.
- Stabilized construction entrances.
- Regular sweeping of adjacent streets.
- A monitoring program to ensure that all BMPs are implemented.
- Each job site should be managed in such a manner to avoid discharges of prohibited substances to the storm drain system.
- Routine inspection of job site should be performed to ensure that construction, demolition and excavation materials (liquid or solid) are not entering the storm drain system.
- Cleaning equipment or tools over catch basins is prohibited.
- Keep the job site tidy and clean up debris regularly.

- Storm drain catch basins should be covered to prevent pollutants and sediments from entering the storm drain system.
- Special precautions should be employed if rain is forecast or if water is applied. These precautions should include, but are not limited to:
  - Increased monitoring frequency for storm drains and to rectify ongoing releases or to identify and prevent any possible release; and
  - Reduction in activities that can cause material to come into contact with rain water
- Following all construction, demolition and excavation activities; the job site should be swept to remove debris and residue. Catch basins should be vacuumed to remove sediment and debris.

ii. BMPs for Erosion Control, Site Stabilization and Stormwater Management
NASA Ames has also committed to a series of BMPs that address erosion control, site stabilization and stormwater management. These BMPs are applicable to all building, construction and landscaping activities at Ames Research Center including the planting and maintenance of vegetation, the diversion of run-on and runoff, and the placement of sandbags, silt screens or other sediment control devices.

Soil erosion prevention is not required in many areas of Ames because the vegetation primarily consists of marshlands and grasslands. However, erosion prevention measures are considered during any construction and /or grounds maintenance activities. The BMPs that apply under this category include the following:

- Identify areas which, due to topography, activities or other factors, have a high potential for significant soil erosion, and identify structural, vegetative, and / or stabilization measures used to limit erosion.
- Retain as much vegetation (plants) onsite as possible.
- Minimize the time that soil is exposed. Water exposed areas to control dust.

- Prevent runoff from flowing across disturbed areas (divert the flow to vegetated areas).
- Stabilize the disturbed soils as soon as possible by planting vegetation or hydroseeding.
- Slow down the run-off flowing across site (regrading, silt fences, planting).
- Provide drainage ways for the increased run-off (use grassy swales rather than concrete drains).
- Remove sediment from storm water run-off before it leaves the site.
- For large piles of soil where tarps or other covers are not feasible, place filtering media (e.g. straw bales, rocks, silt fences, etc.) around the base of each pile or at the storm drain inlet to remove these materials from rainwater run-off.

iii. BMPs to Achieve No Net Increase in Peak Discharge to the Storm Water Retention Pond

NASA would also incorporate BMPs that would achieve no net increase in peak discharge to the Storm Water Retention Pond (SWRP). These BMPs are as follows:

- Determine the conceptual design of the structural, in line modifications/detention (for NASA Research Park), and athletic field/detention pond and grass lined swale in buffer zone (for Bay View) required to achieve no net increase in peak discharge to the SWRP.
- Investigate the use of decentralized detention elements such as green roofs, grass lined swales for roof water runoff, and possibly permeable pavements to aid in achieving no net increase in peak discharge to the SWRP.

iv. BMPs to Reduce Pollutant Loading in Stormwater Runoff

NASA would incorporate the following BMPs into the Design Guidelines for the development proposed under the NADP to reduce pollutant loading in the stormwater runoff:

- Enclosed community car wash areas that drain to the sanitary sewer system.
- Enclosed and covered community dumpsters.
- A regular street sweeping program of parking lots and streets.
- Direct runoff from roof downspouts into landscaped areas.
- Direct runoff from parking lots through grassy swales in landscaped areas before entering drainage system.
- Labeled Storm Drain inlets saying "No dumping! Flows to Wetland Habitat!" or other appropriate wording to be determined.
- Use of warm season grasses and drought tolerant vegetation.
- Installation of efficient irrigation systems in landscaped areas to minimize runoff, such as bubblers instead of sprinklers.

C. The Alternatives

This section describes the project alternatives in terms of land use and job generation, open space provision, and security and circulation. Figures 2-2 through 2-5 and Tables 2-5 through 2-12 show the development that would occur under Alternatives 2 through 5, which are the alternatives that include new development. Table 2-13 shows employment and population forecasts for Alternatives 2 through 5.

1. Alternative 1: The No Project Alternative

Under the National Environmental Protection Act (NEPA) (42 U.S.C. 4321 *et seq.*), every EIS is required to include an option in which the proposed project does not take place and the status quo is maintained. This No Project alternative serves as a base case from which the impacts of all of the other alternatives are measured. Section A, above, describes the baseline conditions

at Ames Research Center if no new development were proposed.[4] Under this baseline, the NRP area would have buildings totaling approximately 186,000 square meters (2 million square feet), the Eastside/Airfield (including CANG) would have a total of approximately 106,000 square meters (1.1 million square feet), the Ames Campus area would have a total of approximately 270,000 square meters (2.9 million square feet) and there would be no development in the Bay View area. The baseline level of development for the entire Ames Research Center would thus be approximately 561,000 square meters (6 million square feet), including development under the CANG EA.

a. Land Use and Job Generation

Under the No Project Alternative, there would be no additional uses beyond those included in the baseline. There would be no new housing units constructed, and the airfield would continue to be restricted to government use, with no cargo, general aviation, or commercial uses allowed. Employment levels would remain below the threshold of 10,610 jobs set in the CUP EA.

b. Open Space

Under the No Project Alternative, there would be no changes to open space at Ames Research Center beyond the baseline described above in Section A.

c. Security and Circulation

As described above in Section A, the security fence would be moved to the outer edges of the NRP area under baseline conditions. The Ellis Street gate area would be reconfigured to make it the primary entrance to the NRP area. In addition, a new roadway would be constructed to link the new development

[4] As described in the Executive Summary, the name for this alternative under NEPA is typically the "No Action" alternative. However, given that this alternative would include some action as projects cleared earlier were implemented, and that "No Project" is the CEQA equivalent of "No Action" and thus very familiar to the public reading the document, ARC has determined that "No Project" is the more appropriate name for this alternative.

under the CUP EA to the Ellis Street entrance. No other circulation or security changes would occur under Alternative 1.

Under the No Project Alternative, the current TDM program at Ames Research Center would be maintained. An additional TDM program would be implemented for the CUP EA projects. No other TDM measures would be instituted.

2. Alternative 2

Alternative 2 calls for a total of approximately 363,000 square meters (3.9 million square feet) of new development. Approximately 165,000 square meters (1.8 million square feet) of existing space would be renovated, including all three of the historic hangars, and roughly 52,000 square meters (560,000 square feet) of existing space in non-historic buildings would be demolished. Total build out within Ames Research Center would be approximately 845,000 square meters (9.1 million square feet), an increase in density of approximately 67 percent. Table 2-5 summarizes and Figure 2-2 shows the land use plan for Alternative 2.

Within the Shenandoah Plaza Historic District, all historic buildings would be preserved. Most of the non-historic buildings would be removed. A strip of cleared land running parallel to Hangar One would be converted back to open space as it was in the original site plan for the Moffett Field. Other cleared areas would be developed with infill buildings carefully designed to be harmonious with the colors, materials, and scale of the historic structures. Outside the Shenandoah Plaza Historic District, new buildings within the NRP and Bay View areas would be three to four stories high. They would be located along street frontages, with structured parking behind them, shielded from view.

a. Land Use and Job Generation

Under Alternative 2, new construction at Ames Research Center would be located in the NRP, Bay View and Eastside/Airfield areas.

— **NRP.** There would be approximately 186,000 square meters (2 million square feet) of new office, research and development, classroom, museum, conference center and housing constructed in the NRP area. Approximately 52,000 square meters (560,000 square feet) of existing space would be demolished, and approximately 46,000 square meters (500,000 square feet) would be renovated.

— **Bay View.** Approximately 121,000 square meters (1.3 million square feet) of new office, research and development, university-related space and housing would be constructed in the Bay View area.

— **Eastside/Airfield.** Alternative 2 proposes the construction of approximately 51,000 square meters (550,000 square feet) of new office, research and development, and fire training space in the Eastside/Airfield area. Approximately 72,000 square meters (780,000 square feet) of space in historic Hangars Two and Three would be converted to low-density research and development and light industrial space. Table 2-6 lists the new uses included in Alternative 2, which are described above in Section B.

As shown in Table 2-13, Alternative 2 is projected to generate approximately 13,068 new workers at ARC. A total of 2,010 residents would live on-site. Approximately 1,634 of these would live in townhomes and apartment units, and 376 would live in student apartments and dormitory units.

b. Open Space

Under Alternative 2, one hole of the golf course on the east side of Macon Road would be relocated. The 1.8-hectare (4.5-acre) central green of Shenandoah Plaza would be preserved. A new linear greenway parallel to Hangar One would be created, restoring the original site plan for Moffett Field, and there would also be a number of new linear open spaces and plazas in the NRP area. Approximately 20.4 hectares (50.55 acres) of the current open grassland in Bay View would be developed under Alternative 2, including 4.6 hectares (11.4 acres) of new active recreation areas. Finally, burrowing owl preserves of 9, 3, 11 and 10 hectares (22, 8, 27, and 24 acres) would be set aside

in the NRP, the Ames Campus, the Bay View and Eastside/Airfield areas respectively, as described in the BOHMP.

c. Security and Circulation

As described above in Section A, under baseline conditions the security fence would be moved to the outer edges of the NRP area and a new gate constructed on Macon Road to provide secured access to the Eastside/Airfield area. Under Alternative 2, the new security fence would be repositioned to the outer edges of the Ames Campus area in order to allow public access to the Bay View area. The fence would also be relocated in the vicinity of the burrowing owl habitat near the airfield at the southern end of the NRP.

Under Alternative 2, the historic roadway network within the Shenandoah Plaza Historic District would be preserved. The street grid in the rest of the NRP area would be reconfigured to serve the new development parcels, creating a grid pattern that would run parallel to the east/west axis of Shenandoah Plaza, and then shift approximately 45E to parallel Highway 101. The Ellis Street gate area would be reconfigured to make it the primary entrance to the NRP area. The existing grid within the Bay View area would be expanded to serve the new development parcels.

No new roadways would be required in the Eastside/Airfield or Ames Campus areas.

Parking would be distributed throughout Ames Research Center in parking structures and surface lots based upon need. During peak parking demand events, such as major events at Hangar One, large portions of the paved airfield areas would be used as spillover parking. Parking structures in proximity to Hangar 1 and the other visitor attractions would be designed to allow shared use between these facilities and adjacent office building users.

Table 2-5: Alternative 2 Land Use Summary

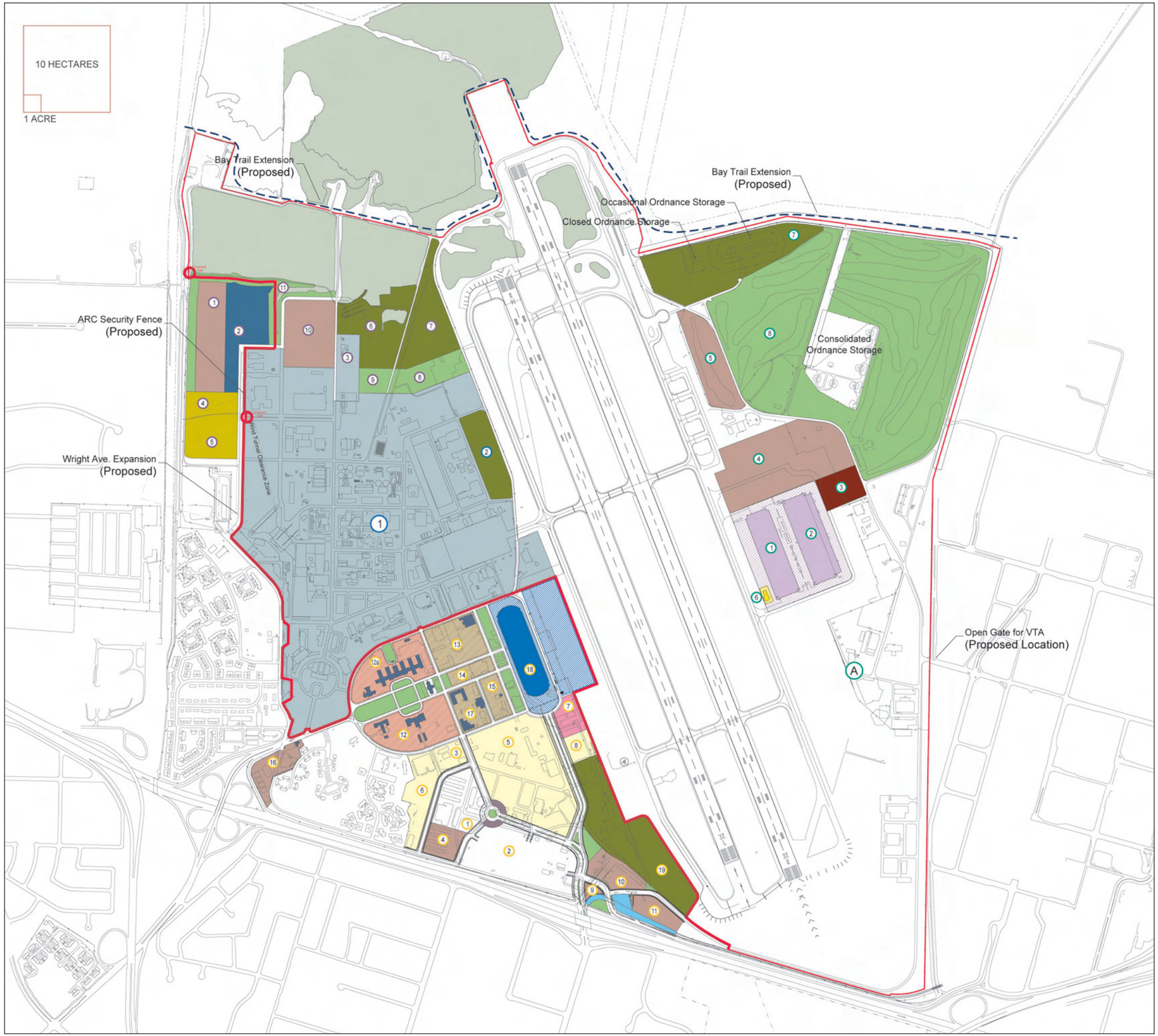
Parcel		Land Use		Parcel Area (HECT)	Parcel Area (AC)	FAR	Developable Area (MS)	Developable Area (SF)
Ames Campus	1	ARC Facilities		91.60	*226 35*	0.29	268,458	*2,889,658*
	2	Preserve		3.15	*7.78*	N/A	N/A	*N/A*
		Sub Total		**94.8**	*234.1*		**268,458**	*2,889,658*
NASA Research Park	1	Lab Project	*	3 36	*8.31*	0.33	11,148	*120,000*
	2	Lab Project	*	7 90	*19.53*	0.71	55,742	*600,000*
	3	University Reserve		1 03	*2.53*	0.59	6,039	*65,000*
	4	Partner Parcel		1 50	*3.70*	0.53	7,897	*85,000*
	5	University Reserve		11 58	*28 60*	0.66	76,180	*820,000*
	6	University Reserve		2 88	*7.11*	1.16	33,445	*360,000*
	7	Computer Museum		1 26	*3.11*	0.52	6,503	*70,000*
	8	University Reserve		1 02	*2.52*	0.64	6,503	*70,000*
	9	Gateway Parcel		0 26	*0.65*	0.42	1,116	*12,010*
	10	Partner Parcel		1 90	*4.70*	0.68	13,006	*140,000*
	11	Partner Parcel		1 36	*3.35*	0.75	10,219	*110,000*
	12	Historic District	*	7 91	*19.55*	N/A	8,268	*89,000*
	12a	Historic District					1,486	*16,000*
	13	Historic District Infill		2 31	*5.70*	0.40	9,290	*100,000*
	14	Historic District Infill		1.72	*4.26*	0.67	11,613	*125,000*
	15	Historic District Infill		1 06	*2.62*	0.66	6,968	*75,000*
	16	Partner Parcel		1 85	*4.56*	0.70	13,006	*140,000*
	17	Historic Dist Reno		1.72	*4.26*	N/A	4,181	*45,000*
	18	C.Air & Space Cntr.		5.70	*14 09*	0.64	36,232	*390,000*
	19	Preserve		8 83	*21 82*	N/A	N/A	*N/A*
	X	No Change		N/A	*N/A*	N/A	6,316	*67,990*
		Sub Total		**65.1**	*161.0*		**325,161**	*3,500,000*
Eastside / Airfield	1	Adaptive Re-Use Hangar 2 (46)		6.17	*15 24*	0.52	32,226	*346,875*
	2	Adaptive Re-Use Hangar 3 (47)		6.48	*16 02*	0.62	40,296	*433,738*
	3	Training/Conf. Cntr.		1 86	*4.60*	0.40	7,432	*80,000*
	4	Partner Parcel		10.46	*25 84*	0.32	33,445	*360,000*
	5	Partner Parcel		3 99	*9.86*	0.23	9,104	*98,000*
	6	A/C Control Tower		0.19	*0.46*	0.60	1,115	*12,000*
	7	Preserve		9 82	*24 26*	N/A	N/A	*N/A*
	8	Open Space		61 28	*151.43*	N/A	N/A	*N/A*
	X	No Change		N/A	*N/A*	N/A	7,341	*79,023*
		Sub Total		**100.2**	*247.7*		**130,959**	*1,409,636*
	A	CANG Master Plan (EA)	**					
Bay View	1	Partner Housing		4.17	*10 30*	0.67	27,871	*300,000*
	2	Education Reserve		5.11	*12 62*	0.91	46,452	*500,000*
	3	NASA Reserve		2 04	*5.03*	N/A	N/A	*N/A*
	4	Recreation		1.63	*4.02*	N/A	N/A	*N/A*
	5	Recreation		2 98	*7.37*	N/A	N/A	*N/A*
	6	Preserve		6 31	*15 60*	N/A	N/A	*N/A*
	7	Preserve		4 81	*11 89*	N/A	N/A	*N/A*
	8	Open Space		2.57	*6.35*	N/A	N/A	*N/A*
	9	Open Space		1.02	*2.52*	N/A	N/A	*N/A*
	10	Partner Parcel		4.52	*11.17*	1.03	46,452	*500,000*
	11	Open Space		3.03	*7.49*	N/A	N/A	*N/A*
		Sub Total		**38.2**	*94.4*		**120,774**	*1,300,000*
Total							**845,352**	*9,099,294*
	A	CANG Master Plan(EA)	**	44 52	*110 00*	N/A	6,020	*64,800*
		Existing CANG Facilities		N/A	N/A	N/A	20,717	*223,000*

* *"Preapproved pursuant to the 1994 NASA/MFA Environmental Assessment - Comprehensive Use Plan"*

** *"Preapproved pursuant to the CANG EA Master Plan - Square footage not included in totals*

FIGURE 2.2

PROPOSED LAND USE PLAN
ALTERNATIVE TWO



LEGEND:

- Partner Parcel
- Community Support
- University Reserve
- NASA Reserved
- Recreation
- Adaptive Reuse (Hangars)
- Relocated AT Control Tower
- Training/Conference Center
- California Air and Space Center
- Historic District Infill
- Historic District Renovation
- Historic Buildings
- Computer Museum
- Supporting Retail
- Light Rail
- Preserve (Burrowing Owl)
- Open Space
- Wetlands
- Fence Line
- Bay Trail Extension

Denotes Parcel Number as Noted on Table 2-5

- Ames Campus
- NASA Research Park
- Eastside / Airfield
- Bay View

DMJMH+N EDAW

0 76m 152m 305m
0 250ft 500ft 1000ft

NASA AMES RESEARCH CENTER
NASA AMES DEVELOPMENT PLAN FINAL EIS

TABLE 2-6: **NEW USES UNDER ALTERNATIVE 2**

Location	Use	Square Meters	Square Feet
NRP Area:	Educational Uses	78,036	840,000
	Computer History Museum	6,503	70,000
	CASC	36,231	390,000
	Conference Center	18,580	200,000
	Housing:		
	188 800 sf units	13,935	150,000
	300 1,200 sf units	33,444	360,000
	Office/High Density R&D	46,637	502,010
	Retail and Support Services	4,645	50,000
	Total New Uses in NRP Area:	**238,010**	**2,562,010**
Ames Campus Area:	No new uses under this alternative		
	Total New Uses in Ames Campus Area	-	-
Eastside/Airfield Area:	Office/High Density R&D	33,444	360,000
	Low Density R&D/Light Industrial:		
	Renovation of Hangars 2 and 3	72,520	780,613
	Other	10,219	110,000
	Emergency Training Center	7,432	80,000
	Total New Uses in Eastside/ Airfield Area:	**123,615**	**1,330,613**
Bay View Area:	Educational, Child Care and Support Uses	46,450	500,000
	Housing: 250 1,200 sf units	27,870	300,000
	Office/High Density R&D	46,450	500,000
	Total New Uses in Bay View Area:	**120,770**	**1,300,000**
	Total New Uses Under Alternative 2:	**482,395**	**5,192,623**

The new TDM program described above in Section B would be implemented in the Bay View and NRP areas. In addition, the provision of on-site housing for employees and students under Alternative 2 would substantially reduce the number of vehicle trips that would normally be generated by the proposed new uses within Ames Research Center. Proposed housing would reduce the gross number of daily trips by approximately 13 percent, and the gross number of peak hour trips by approximately 31 percent. More detailed discussion of project trip generation can be found in Section 4.3.

3. Alternative 3

Alternative 3 calls for a total of approximately 280,000 square meters (3 million square feet) of new development. Approximately 165,000 square meters (1.8 million square feet) of existing space would be renovated, including all three of the historic hangars. Roughly 52,000 square meters (560,000 square feet) of existing space in non-historic buildings would be demolished. Total build out within Ames Research Center would be approximately 766,000 square meters (8.2 million square feet), an increase in density of approximately 52 percent. Table 2-7 summarizes and Figure 2-3 shows the land use plan for Alternative 3.

Alternative 3 is based on the 1998 Arcadia Vision Plan, which was developed by private consultants working in conjunction with NASA to create a "neo-traditional" mixed-use residential and office development at Ames Research Center. All new construction proposed under Alternative 3 would be clustered in the NRP area; in addition, the historic hangars in the Eastside/Airfield area would be renovated for reuse. Alternative 3 does not propose any new construction in the Bay View, Eastside/Airfield, or Ames Campus areas.

Under Alternative 3, the new development within the NRP area would primarily take the form of two- to three-story buildings running along the perimeter of each block and enclosing landscaped interior courtyards. These buildings would use the

Spanish Colonial Revival design and site layout of the existing historic buildings as a precedent, unifying the historic and non-historic parts of the NRP area.

a. Land Use Plan and Job Generation

Under Alternative 3, new construction at Ames Research Center would be located only in the NRP area, with some renovation in the Eastside/Airfield area.

- **NRP.** Under Alternative 3, approximately 280,000 square meters (3 million square feet) of new office, research and development, university-related, museum, conference center, and housing uses would be constructed in the NRP area. Approximately 46,000 square meters (500,000 square feet) of existing buildings, including Hangar One, would be renovated, and another 52,000 square meters (560,000 square feet) of existing buildings would be demolished. The total build out in the NRP area would be approximately 420,000 square meters (4.5 million square feet). Uses would be mixed vertically in new buildings, with research, education, and service facilities on lower floors and housing above.
- **Eastside/Airfield.** Alternative 3 proposed the renovation of Hangars 2 and 3 in the Eastside/Airfield area to house new light industrial or low-density research and development uses. No new buildings would be constructed.

Table 2-8 lists the new uses included in Alternative 3, which are described above in Section B.

As shown in Table 2-13, Alternative 3 is projected to generate approximately 11,047 new workers at ARC. A total of 1,267 residents would live on-site. Approximately 891 of these would live in townhome and apartment units, and 376 would live in student apartments and dormitory units.

Table 2-7: Alternative 3 Land Use Summary

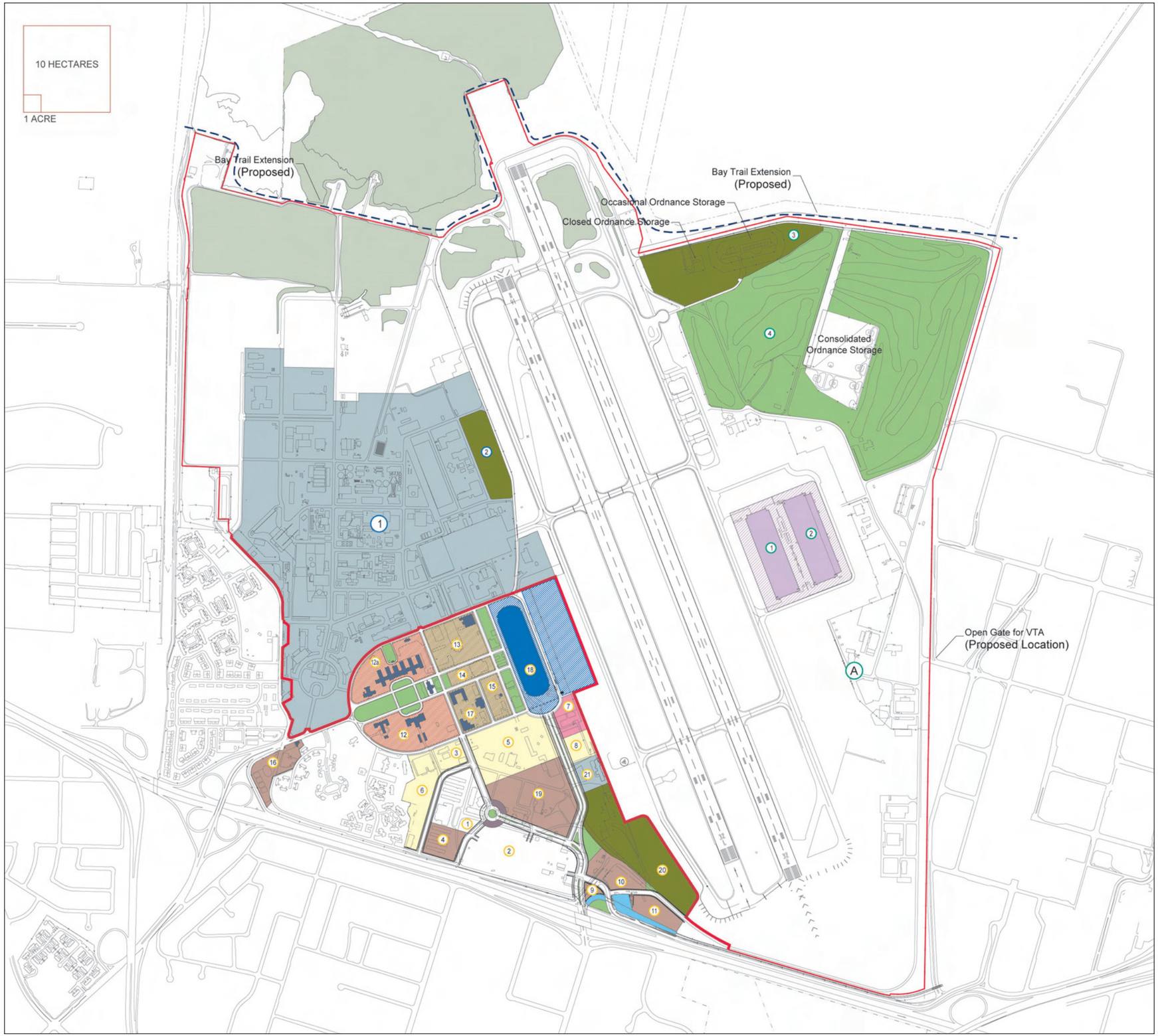
Parcel		Land Use		Parcel Area (HECT)	Parcel Area (AC)	FAR	Developable Area (MS)	Developable Area (SF)
Ames Campus	1	ARC Facilities		91.60	*226.35*	0.29	268,458	*2,889,658*
	2	Preserve		3.15	*7.78*	N/A	N/A	*N/A*
		Sub Total		**94.8**	*234.1*		**268,458**	*2,889,658*
NASA Research Park	1	Lab Project	*	3.36	*8.31*	0.33	11,148	*120,000*
	2	Lab Project	*	7.90	*19.53*	0.71	55,742	*600,000*
	3	University Reserve		1.03	*2.53*	0.59	6,039	*65,000*
	4	Partner Parcel		1.50	*3.70*	0.53	7,897	*85,000*
	5	University Reserve		5.89	*14.56*	1.32	78,039	*840,000*
	6	University Reserve		2.88	*7.11*	1.16	33,445	*360,000*
	7	Computer Museum		1.26	*3.11*	0.52	6,503	*70,000*
	8	University Reserve		1.02	*2.52*	0.68	6,968	*75,000*
	9	Gateway Parcel		0.26	*0.65*	0.42	1,116	*12,010*
	10	Partner Parcel		1.90	*4.70*	0.98	18,581	*200,000*
	11	Partner Parcel		1.36	*3.35*	1.03	13,935	*150,000*
	12	Historic District	*	7.91	*19.55*	N/A	8,268	*89,000*
	12a	Historic District					1,486	*16,000*
	13	Historic District Infill		2.31	*5.70*	N/A	10,684	*115,000*
	14	Historic District Infill		1.72	*4.26*	0.86	14,864	*160,000*
	15	Historic District Infill		1.06	*2.62*	0.79	8,361	*90,000*
	16	Partner Parcel		1.85	*4.56*	1.01	18,581	*200,000*
	17	Historic Dist Reno		1.72	*4.26*	0.24	4,181	*45,000*
	18	C.Air & Space Cntr.		5.70	*14.09*	N/A	36,232	*390,000*
	19	Partner Parcel		5.68	*14.05*	1.23	69,677	*750,000*
	20	Preserve		7.66	*18.94*	N/A	N/A	*N/A*
	21	NASA Reserved		1.16	*2.87*	N/A	N/A	*N/A*
	X	No Change		N/A	*N/A*	N/A	6,316	*67,990*
		Sub Total		**65.1**	*161.0*		**418,064**	*4,500,000*
Eastside / Airfield	1	Adaptive Re-Use Hangar 2 (46)		6.35	*15.69*	0.51	32,226	*346,875*
	2	Adaptive Re-Use Hangar 3 (47)		6.48	*16.02*	0.62	40,296	*433,738*
	3	Preserve		9.82	*24.26*	N/A	N/A	*N/A*
	4	Open Space		59.53	*147.11*	N/A	N/A	*N/A*
	X	No Change		N/A	*N/A*	N/A	7,341	*79,023*
		Sub Total		**82.2**	*203.1*		**79,863**	*859,636*
	A	CANG Master Plan (EA)	**					
Total							**766,385**	*8,249,294*
	A	CANG Master Plan(EA)	**	44.52	*110.00*	N/A	6,020	*64,800*
		Existing CANG Facilities		N/A	N/A	N/A	20,717	*223,000*

* *"Preapproved pursuant to the 1994 NASA/MFA Environmental Assessment - Comprehensive Use Plan"*

** *"Preapproved pursuant to the CANG EA Master Plan - Square footage not included in totals*

FIGURE 2.3

PROPOSED LAND USE PLAN
ALTERNATIVE THREE



LEGEND:

- Partner Parcel
- University Reserve
- NASA Reserved
- Adaptive Reuse (Hangars)
- California Air and Space Center
- Historic District Infill
- Historic District Renovation
- Historic Buildings
- Computer Museum
- Supporting Retail
- Light Rail
- Preserve (Burrowing Owl)
- Open Space
- Wetlands
- Fence Line
- Bay Trail Extension

Denotes Parcel Number as Noted on Table 2-7

- (1) Ames Campus
- (1) NASA Research Park
- (1) Eastside / Airfield

DMJMH+N EDAW IN

0 76m 152m 305m
0 250ft 500ft 1000ft

NASA AMES RESEARCH CENTER
NASA AMES DEVELOPMENT PLAN FINAL EIS

TABLE 2-8: **NEW USES UNDER ALTERNATIVE 3**

Location	Use	Square Meters	Square Feet
NRP Area:	Educational Uses	78,036	840,000
	Computer History Museum	6,503	70,000
	CASC	36,231	390,000
	Conference Center	23,225	250,000
	Housing:		
	188 800 sf units	13,935	150,000
	300 1,200 sf units	33,444	360,000
	Office/High Density R&D	132,569	1,427,010
	Retail and Support Services	6,968	75,000
	Total New Uses in NRP Area:	**330,911**	**3,562,010**
Ames Campus Area:	No new uses under this alternative		
	Total New Uses in Ames Campus Area:	**-**	**-**
Eastside/Airfield Area:	Low Density R&D/Light Industrial:		
	Renovation of Hangars 2 and 3	72,520	780,613
	Total New Uses in Eastside/ Airfield Area:	**72,520**	**780,613**
Bay View Area:	No new uses under this alternative		
	Total New Uses in Bay View Area:	**-**	**-**
	Total New Uses Under Alternative 3:	**403,431**	**4,342,623**

b. Open Space

As in Alternative 2, the central green in Shenandoah Plaza would be preserved, and a new linear greenspace adjacent to Hangar 1 would be created. In addition, the new buildings within the NRP area would enclose a substantial amount of new green space in interior landscaped courtyards. The large tract of undeveloped land adjacent to the new light rail station would be redeveloped, but none of the existing open space in the Bay View, Eastside/Airfield, or Ames Campus areas would be removed. Finally, a burrowing owl preserve would be set aside in the NRP as described in the BOHMP.

c. Security and Circulation

As described above in Section A, under baseline conditions the security fence would be moved to the outer edges of the NRP area and a new gate constructed on Macon Road to provide secured access to the Eastside/Airfield area. Under Alternative 3, the fence would also be relocated in the vicinity of the burrowing owl habitat near the airfield at the southern end of the NRP.

Under Alternative 3, the historic road network within the Shenandoah Plaza Historic District would remain, but the rest of the NRP area would require new roadway infrastructure. As in Alternative 2, the new road network would consist of a modified grid that pivoted to follow the orientation of Highway 101 to the southwest, and the airfield to the east. Most of the new roads would be narrow, with only one lane in each direction, since automobile use would be discouraged within the NRP area through parking and other TDM policies.

Parking within the NRP area would be centralized in a single large structured parking facility near Highway 101, with a second surface lot on the far side of Hangar 1 to serve the east side of the NRP area and to provide parking for visitors to the California Air and Space Center. The most dense development would lie between the garage and the new light rail station at Ellis Street. Inside Ames Research Center, the primary modes of transportation would be foot and bicycle.

The new TDM program described above in Section B would be implemented. In addition, the provision of on-site housing for employees and students under Alternative 3 would substantially reduce the number of vehicle trips that would normally be generated by the proposed new uses within Ames Research Center. Proposed housing would reduce the gross number of daily trips by approximately 14 percent, and the gross number of peak hour trips by approximately 26 percent. More detailed discussion of project trip generation can be found in Section 4.3.

4. Alternative 4

Under Alternative 4, the majority of the proposed new development would be concentrated within the Bay View area, with substantial amounts of new development located within the NRP and Eastside/Airfield areas as well. Alternative 4 calls for a total of approximately 458,000 square meters (4.9 million square feet) of new development. Approximately 258,000 square meters (2.8 million square feet) of existing space would be renovated, including all three of the historic hangars, and roughly 52,000 square meters (560,000 square feet) of existing space in non-historic buildings would be demolished. Total build out under Alternative 4 would be approximately 940,000 square meters (10.1 million square feet), an increase in density of approximately 84 percent. Table 2-9 summarizes and Figure 2-4 shows the land use plan for Alternative 4.

— **NRP.** Under Alternative 4, there would be approximately 145,000 square meters (1.6 million square feet) of new office, research and development, university-related, museum, conference center, housing and retail uses in the NRP area. Approximately 52,000 square meters (560,000 square feet) of existing space would be demolished, and approximately 46,000 square meters (500,000 square feet) would be renovated.

— **Bay View.** Within the Bay View area, Alternative 4 proposes the construction of approximately 251,000 square meters (2.7 million square feet) of new office, research and development, light industrial, university-related, and housing uses.

— **Eastside/Airfield.** Alternative 4 proposes the construction of approximately 62,000 square meters (670,000 square feet) of new office and research and development space, as well as the Regional Fire Training Center within the Eastside/Airfield area. Also within the Eastside/ Airfield area, Alternative 4 proposed the reuse of approximately 72,000 square meters (780,000 square feet) within Hangars 2 and 3 for low density research and development and light industrial space. Table 2-10 lists the new uses included in Alternative 4, which are described above in Section B.

As shown in Table 2-13, Alternative 4 is projected to generate approximately 15,599 new workers at NRP. A total of 2,574 residents would live on-site. Approximately 2,286 of these would live in townhome and apartment units, and 288 would live in student apartments and dormitory units.

a. Open Space

Under Alternative 4, one hole of the golf course on the east side of Macon Road would be relocated. The 1.8-hectare (4.5-acre) central green of Shenandoah Plaza would be preserved, and a new linear greenway parallel to Hangar 1 would be created, restoring the original site plan for Moffett Field. Approximately 29.9 hectares (73.86 acres) of the current open grassland in Bay View would be developed under Alternative 2, including 2.9 hectares (7.4 acres) of new active recreation area. Finally, burrowing owl preserves of 9, 3, and 10 hectares (22, 8, and 24 acres) would be set aside in the NRP, Ames Campus, and Eastside/Airfield areas respectively as described in the BOHMP. This would result in a net loss of 11 hectares (27 acres) of burrowing owl habitat in the Bay View.

b. Security and Circulation

As described above in Section A, under baseline conditions the security fence would be moved to the outer edges of the NRP area and a new gate constructed on Macon Road to provide secured access to the Eastside/Airfield area. Under Alternative 4, the new security fence would be repositioned to the outer edges of the Ames Campus area in order to allow public access to part of the Bay

View area. The fence would also be relocated in the vicinity of the burrowing owl habitat near the airfield at the southern end of the NRP.

As under Alternative 2, the historic roadway network within the Shenandoah Plaza Historic District would be preserved under Alternative 4. The street grid in the rest of the NRP area would be reconfigured to serve the new development parcels, creating a grid pattern that would run parallel to the east/west axis of Shenandoah Plaza, and then shift approximately 45E to parallel Highway 101. The existing grid within the Bay View area would be expanded to serve the new development parcels. No new roadways would be required in the Eastside/Airfield or Ames Campus areas.

Parking would be distributed throughout Ames Research Center in parking structures and surface lots based upon need. During peak parking demand events, such as major events at Hangar 1, large portions of the paved airfield areas would be used as spillover parking. Parking structures in proximity to Hangar 1 and the other visitor attractions would be designed to allow shared use between these facilities and adjacent office building users.

As under Alternatives 2 and 3, the new TDM program described above in Section B would be implemented in Bay View and NRP. In addition, the provision of on-site housing for employees and students under Alternative 4 would substantially reduce the number of vehicle trips that would normally be generated by the proposed new uses within Ames Research Center. Proposed housing would reduce the gross number of daily trips by approximately 15 percent, and the gross number of peak hour trips by approximately 29 percent. More detailed discussion of project trip generation can be found in Section 4.3.

5. Alternative 5

Under Alternative 5 there would be new construction in all four development areas, although much of the proposed 330,000 square meters (3.6 million square feet) of new development would be concentrated in the NRP area. Approximately 56,000 square meters (603,000 square feet) of existing space would be renovated, including Hangar 1, and roughly 89,000 square meters

Table 2-9: Alternative 4 Land Use Summary

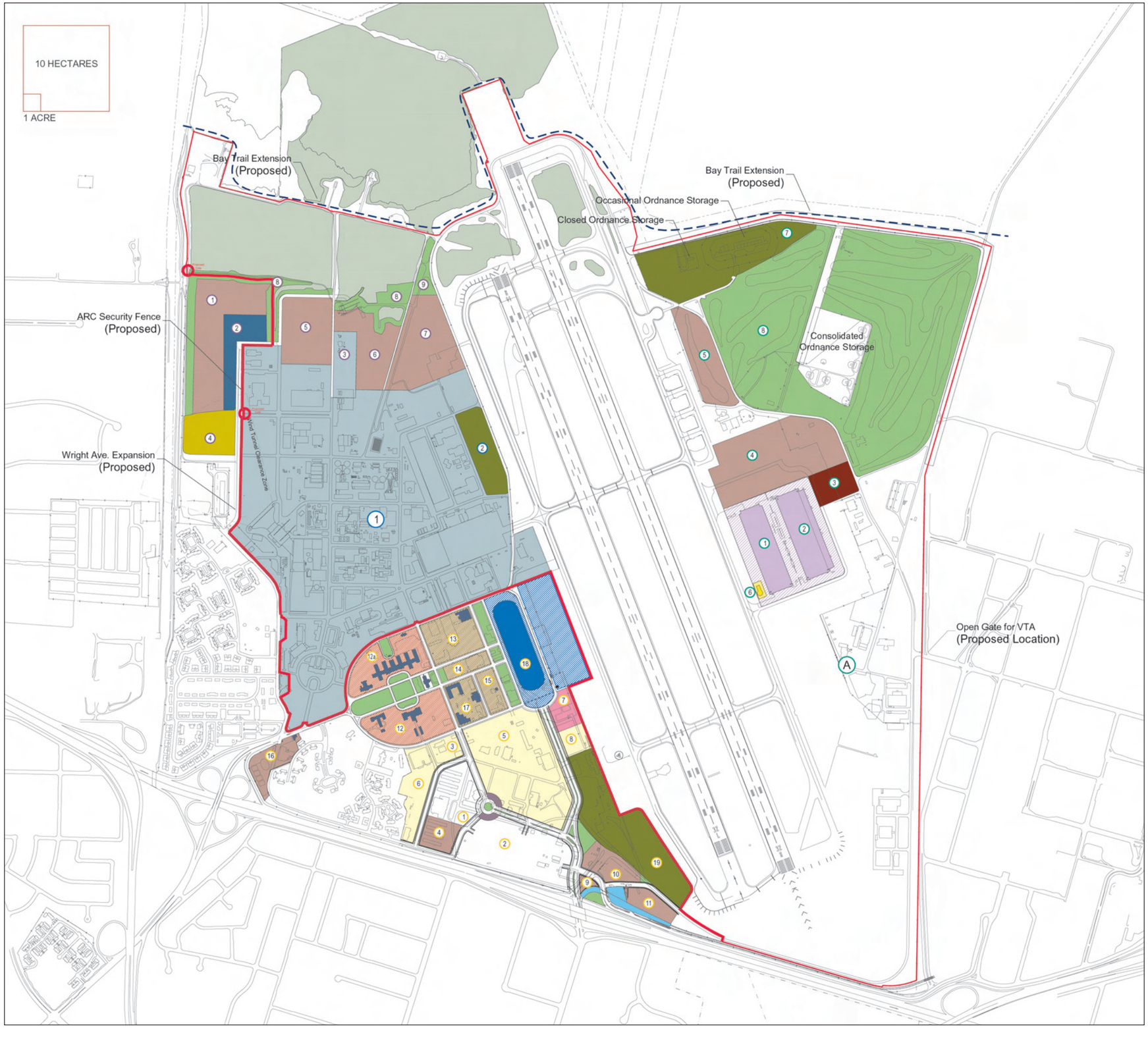
Parcel		Land Use		Parcel Area (HECT)	Parcel Area (AC)	FAR	Developable Area (MS)	Developable Area (SF)
Ames Campus	1	ARC Facilities		91.32	*225.67*	0.29	268,458	*2,889,658*
	2	Preserve		3.15	*7.78*	N/A	N/A	*N/A*
		Sub Total		**94.5**	*233.4*		**268,458**	*2,889,658*
NASA Research Park	1	Lab Project	*	3.36	*8.31*	0.33	11,148	*120,000*
	2	Lab Project	*	7.90	*19.53*	0.71	55,742	*600,000*
	3	University Reserve		1.03	*2.53*	0.59	6,039	*65,000*
	4	Partner Parcel		1.50	*3.70*	0.31	4,645	*50,000*
	5	University Reserve		11.58	*28.60*	0.61	71,071	*765,000*
	6	University Reserve		2.88	*7.11*	0.86	24,619	*265,000*
	7	Computer Museum		1.26	*3.11*	0.52	6,503	*70,000*
	8	University Reserve		1.02	*2.52*	0.64	6,503	*70,000*
	9	Gateway Parcel		0.26	*0.65*	0.07	187	*2,010*
	10	Partner Parcel		1.90	*4.70*	0.27	5,110	*55,000*
	11	Partner Parcel		1.36	*3.35*	0.27	3,716	*40,000*
	12	Historic District	*	7.91	*19.55*	N/A	8,268	*89,000*
	12a	Historic District					1,486	*16,000*
	13	Historic District Infill		2.31	*5.70*	0.20	4,645	*50,000*
	14	Historic District Infill		1.72	*4.26*	0.65	11,148	*120,000*
	15	Historic District Infill		1.06	*2.62*	0.57	6,039	*65,000*
	16	Partner Parcel		1.85	*4.56*	0.28	5,110	*55,000*
	17	Historic District Infill		1.72	*4.26*	N/A	4,181	*45,000*
	18	C.Air & Space Cntr.		5.70	*14.09*	0.64	36,232	*390,000*
	19	Preserve		8.83	*21.82*	N/A	N/A	*N/A*
	X	No Change		N/A	*N/A*	N/A	6,316	*67,990*
		Sub Total		**65.1**	*161.0*		**278,709**	*3,000,000*
Eastside / Airfield	1	Adaptive Re-Use Hangar 2 (46)		6.17	*15.24*	0.52	32,226	*346,875*
	2	Adaptive Re-Use Hangar 3 (47)		6.48	*16.02*	0.62	40,296	*433,738*
	3	Training/Conf. Cntr.		1.86	*4.60*	0.40	7,432	*80,000*
	4	Partner Parcel		10.46	*25.84*	0.43	44,593	*480,000*
	5	Partner Parcel		3.99	*9.86*	0.23	9,104	*98,000*
	6	A/C Control Tower		0.19	*0.46*	0.60	1,115	*12,000*
	7	Preserve		9.82	*24.26*	N/A	N/A	*N/A*
	8	Open Space		61.28	*151.43*	N/A	N/A	*N/A*
	X	No Change		N/A	*N/A*	N/A	7,341	*79,023*
		Sub Total		**100.2**	*247.7*		**142,108**	*1,529,636*
	A	CANG Master Plan (EA)	**					
Bay View	1	Partner Housing		7.47	*18.45*	0.82	61,316	*660,000*
	2	Education Reserve		3.13	*7.74*	0.89	27,871	*300,000*
	3	NASA Reserve		2.04	*5.03*	N/A	N/A	*N/A*
	4	Recreation		2.98	*7.37*	N/A	N/A	*N/A*
	5	Partner Parcel		4.52	*11.17*	0.97	44,032	*473,956*
	6	Partner Parcel		6.29	*15.54*	0.93	58,309	*627,628*
	7	Partner Parcel		6.45	*15.93*	0.92	59,311	*638,416*
	8	Open Space		4.08	*10.09*	N/A	N/A	*N/A*
	9	Open Space		0.93	*2.31*	N/A	N/A	*N/A*
		Sub Total		**37.9**	*93.6*		**250,838**	*2,700,000*
Total							**940,113**	*10,119,294*
	A	CANG Master Plan(EA)	**	44.52	*110.00*	N/A	6,020	*64,800*
		Existing CANG Facilities		N/A	N/A	N/A	20,717	*223,000*

* *"Preapproved pursuant to the 1994 NASA/MFA Environmental Assessment - Comprehensive Use Plan"*

** *"Preapproved pursuant to the CANG EA Master Plan - Square footage not included in totals*

FIGURE 2.4

PROPOSED LAND USE PLAN
ALTERNATIVE FOUR



LEGEND:

- Partner Parcel
- Community Support
- University Reserve
- NASA Reserved
- Recreation
- Adaptive Reuse (Hangars)
- Relocated AT Control Tower
- Training/Conference Center
- California Air and Space Center
- Historic District Infill
- Historic District Renovation
- Historic Buildings
- Computer Museum
- Supporting Retail
- Light Rail
- Preserve (Burrowing Owl)
- Open Space
- Wetlands
- Fence Line
- Bay Trail Extension

Denotes Parcel Number as Noted on Table 2-9

- Ames Campus
- NASA Research Park
- Eastside / Airfield
- Bay View

DMJMH+N EDAW

0 76m 152m 305m
0 250ft 500ft 1000ft

NASA AMES RESEARCH CENTER
NASA AMES DEVELOPMENT PLAN FINAL EIS

TABLE 2-10: **NEW USES UNDER ALTERNATIVE 4**

Location	Use	Square Meters	Square Feet
NRP Area:	Educational Uses	74,320	800,000
	Computer History Museum	6,503	70,000
	CASC	36,231	390,000
	Conference Center	17,187	185,000
	Housing:		
	144 800 sf units	10,684	115,000
	220 1,200 sf units	24,619	265,000
	Office/High Density R&D	18,767	202,010
	Retail and Support Services	3,252	35,000
	Total New Uses in NRP Area:	**191,561**	**2,062,010**
Ames Campus Area:	No new uses under this alternative		
	Total New Uses in Ames Campus Area:	**-**	**-**
Eastside/ Airfield Area:	Office/High Density R&D	44,592	480,000
	Low Density R&D/Light Industrial:		
	Renovation of Hangars 2 and 3	79,520	780,613
	Other	10,219	110,000
	Disaster Training Center	7,432	80,000
	Total New Uses in Eastside/Airfield Area:	**134,763**	**1,450,613**
Bay View Area:	Educational, Child Care and Support Uses	27,870	300,000
	Housing: 550 1,200 sf unit	61,314	660,000
	Office/High Density R&D	143,066	1,540,000
	Low Density R&D/Light Industrial	18,580	200,000
	Total New Uses in Bay View Area:	**250,830**	**2,700,000**
	Total New Uses Under Alternative 4:	**577,154**	**6,212,623**

(962,000 square feet) of existing space in non-historic buildings would be demolished. Alternative 5 has a total build out of approximately 777,000 square meters (8.4 million square feet), an increase in density of approximately 61 percent. Table 2-11 summarizes and Figure 2-5 shows the land use plan for Alternative 5.

a. Land Use and Job Generation

Alternative 5 includes the following components for Ames Research Center's four planning areas:

- **NRP**. There would be approximately 192,000 square meters (2.1 million square feet) of new office, research and development, educational, museum, conference center, housing and retail uses in the NRP area. Approximately 52,000 square meters (560,000 square feet) of existing space would be demolished, and approximately 56,000 square meters (600,000 square feet) would be renovated.
- **Bay View**. Within the Bay View area, there would be approximately 93,000 square meters (1 million square feet) of new construction, almost all of which would be devoted to housing and associated uses.
- **Eastside/Airfield.** Alternative 5 proposes the construction of a new control tower.
- **Ames Campus**. Alternative 5 is unique among the proposed alternatives in proposing new development in the Ames Campus area. Alternative 5 includes the demolition of approximately 37,000 square meters (400,000 square feet) of low density buildings to clear room for the construction of approximately 46,000 square meters (500,000 square feet) of office and high density research and development space. There would be a total of 750 additional employees expected in the Ames Campus area.

Table 2-12 lists the new uses included in Alternative 5, which are described above in Section B.

As shown in Table 2-13, Alternative 5 is projected to generate approximately 7,222 new workers at ARC. There would be 2,808 residents on-site.

Approximately 2,228 of these would live in townhome and apartment units, and 580 would live in student apartments and dormitory units.

With additional mitigation, Alternative 5 would have 4,909 residents on-site. Approximately 3,349 of them would live in townhome and apartment units, and 1,560 would live in student apartments and dormitory units.

b. Open Space

Under Alternative 5, the 1.8-hectare (4.5-acre) central green of Shenandoah Plaza would be preserved. A new linear greenway parallel to Hangar 1 would be created, restoring the original site plan for Moffett Field. The Golf Course in the Eastside/Airfield area would be preserved. Approximately 20.4 hectares (50.5 acres) of upland grassland would be developed in Bay View. New active recreation areas totaling 4.7 hectares (11.5 acres) of park space would be added in the NRP Area. There would also be 4.6 hectares (11.4 acres) of new active recreation space in the Bay View area, in addition to 11 hectares (27 acres) set aside as open space there. There would be a new softball diamond of approximately 1.6 hectares (4 acres) in the Ames Campus area. Finally, burrowing owl preserves of 9, 3, 101 and 11 hectares (22, 8, 24 and 27 acres) would be set aside in the NRP, Ames Campus, and Bay View and Eastside/Airfield areas respectively as described in the BOHMP.

c. Security and Circulation

As described above in Section A, under baseline conditions the security fence would be moved to the outer edges of the NRP area and a new gate constructed on Macon Road to provide secured access to the Eastside/Airfield area. Under Alternative 5, the security fence would be pulled in to the outer edges of the Ames Campus area in order to allow public access to parts of the Bay View area. The fence would also be relocated in the vicinity of the burrowing owl habitat near the airfield at the southern end of the NRP.

Table 2-11: Alternative 5 Land Use Summary

Parcel		Land Use		Parcel Area (HECT)	Parcel Area (AC)	FAR	Developable Area (MS)	Developable Area (SF)
Ames Campus	1	ARC Facilities		89.98	*222.34*	0.31	277,748	*2,989,658*
	2	Preserve		3.15	*7.78*	N/A		*N/A*
	3	Recrea ion		1.62	*4.01*	N/A		*N/A*
		Sub Total		**94.8**	*234.1*		**277,748**	*2,989,658*
NASA Research Park	1	Lab Project	*	3.36	*8.31*	N/A	11,148	*120,000*
	2	Lab Project	*	7.90	*19.53*	0.71	55,742	*600,000*
	3	University Reserve		1.03	*2.53*	0.75	7,711	*83,000*
	4	Partner Parcel		1.50	*3.70*	0.18	2,661	*28,645*
	5	University Reserve		11.58	*28.60*	0.75	86,864	*935,000*
	6	University Reserve		2.88	*7.11*	0.75	21,554	*232,000*
	7	Computer Museum		1.26	*3.11*	0.88	11,148	*120,000*
	8	Partner Parcel		2.43	*6.00*	0.75	18,116	*195,000*
	9	Gateway Parcel		0.26	*0.65*	N/A	N/A	*N/A*
	10	Partner Shared		0.77	*1.91*	N/A	N/A	*N/A*
	11	Partner Shared		1.36	*3.35*	0.08	1,115	*12,000*
	12	Historic District	*	7.91	*19.55*	N/A	8,268	*89,000*
	12a	Historic District					17,280	*186,000*
	13	Historic District Infill		2.59	*6.40*	0.75	19,510	*210,000*
	14	Historic District Infill		0.87	*2.15*	0.27	2,323	*25,000*
	15	Historic District Infill		1.06	*2.62*	0.35	3,716	*40,000*
	16	Partner Parcel		1.85	*4.56*	0.35	6,503	*70,000*
	17	Historic Dist Reno		1.72	*4.26*	N/A	4,181	*45,000*
	18	C.Air & Space Cntr.		5.70	*14.09*	0.81	46,452	*500,000*
	19	Preserve		8.70	*21.50*	N/A	N/A	*N/A*
	X	No Change (H D)		N/A	*N/A*	N/A	869	*9,355*
		Sub Total		**64.7**	*159 9*		**325,161**	*3,500,000*
Eastside / Airfield	1	A/C Control Tower		0.19	*0.46*	0.60	1,114.8	*12,000*
	2	Preserve		59.53	*147.11*	N/A	N/A	*N/A*
	3	Open Space		9.82	*24.26*	N/A	N/A	*N/A*
	X	No Change		25.03	*61.84*	N/A	79,862.8	*859,636*
		Sub Total		**94.6**	*233.7*		**80,978**	*871,636*
	A	CANG Master Plan (EA)	**					
Bay View	1	Housing		7.35	*18.16*	1.14	83,613	*900,000*
	2	Education Reserve		1.93	*4.76*	0.48	9,290	*100,000*
	3	NASA Reserve		2.05	*5.06*	N/A	N/A	*N/A*
	4	Recrea ion		1.63	*4.02*	N/A	N/A	*N/A*
	5	Recrea ion		2.98	*7.37*	N/A	N/A	*N/A*
	6	Preserve		6.16	*15.22*	N/A	N/A	*N/A*
	7	Preserve		4.81	*11.89*	N/A	N/A	*N/A*
	8	Open Space		2.57	*6.35*	N/A	N/A	*N/A*
	9	Open Space		0.90	*2.23*	N/A	N/A	*N/A*
	10	Open Space		4.52	*11.17*	N/A	N/A	*N/A*
	11	Open Space		3.02	*7.46*	N/A	N/A	*N/A*
		Sub Total		**37.9**	*93.7*		**92,903**	*1,000,000*
Total							**776,790**	*8,361,294*
	A	CANG Master Plan(EA)	**	44.52	*110.00*	N/A	6,020	*64,800*
		Exis ing CANG Facilities		N/A	N/A	N/A	20,717	*223,000*

* *"Preapproved pursuant to the 1994 NASA/MFA Environmental Assessment - Comprehensive Use Plan"*

** *"Preapproved pursuant to the CANG EA Master Plan - Square footage not included in totals*

FIGURE 2.5

PROPOSED LAND USE PLAN
ALTERNATIVE FIVE

LEGEND:

- Partner Parcel
- Community Support
- University Reserve
- NASA Reserved
- Recreation
- Relocated AT Control Tower
- Housing
- California Air and Space Center
- Historic District Infill
- Historic District Renovation
- Historic Buildings
- Computer Museum
- Supporting Retail
- Light Rail
- Preserve (Burrowing Owl)
- Open Space
- Wetlands
- Fence Line
- Bay Trail Extension

Denotes Parcel Number as Noted on Table 2-11

- (1) Ames Campus
- (1) NASA Research Park
- (1) Eastside / Airfield
- (1) Bay View

DMJMH+N EDAW

0 76m 152m 305m
0 250ft 500ft 1000ft

NASA AMES RESEARCH CENTER
NASA AMES DEVELOPMENT PLAN FINAL EIS

TABLE 2-12: **NEW USES UNDER ALTERNATIVE 5**

Location	Use	Square Meters	Square Feet
NRP Area:	Educational Uses	89,927	968,000
	Computer History Museum	11,148	120,000
	CASC	46,450	500,000
	Conference Center and Gym	25,548	275,000
	Housing:		
	290 800 sf units	21,553	232,000
	Office/High Density R&D	41,679	448,645
	Retail and Support Services	7,153	77,000
	Total New Uses in NRP Area:	**243,458**	**2,620,645**
Ames Campus Area:	Office/High Density R&D	46,450	500,000
	Total New Uses in Ames Campus Area:	**46,450**	**500,000**
Eastside/Airfield Area:	Control Tower	1,115	12,000
	Total New Uses in Eastside/ Airfield Area:	**1,115**	**12,000**
Bay View Area:	Housing: 750 1,200 sf units	83,610	900,000
	Retail, Child Care and Support Services	9,290	100,000
	Total New Uses in Bay View Area:	**92,900**	**1,000,000**
	Total New Uses Under Alternative 5:	**383,923**	**4,132,645**

As under Alternative 2, the historic roadway network within the Shenandoah Plaza Historic District would be preserved under Alternative 5. The street grid in the rest of the NRP area would be reconfigured to serve the new development parcels, creating a grid pattern that would run parallel to the east/west axis of Shenandoah Plaza, and then shift approximately 45E to parallel Highway 101. The existing grid within the Bay View area would be expanded to serve the new development parcels. No new roadways would be required in the Eastside/Airfield or Ames Campus areas.

Parking would be distributed throughout Ames Research Center in parking structures and surface lots with an emphasis on shared use of parking wherever feasible. During peak parking demand events, such as major events at Hangar One, large portions of the paved airfield areas would be used as spillover parking.

As under Alternatives 2 through 4, the new TDM program described above in Section B would be implemented in the NRP and Bay View areas. In addition, the provision of on-site housing for employees and students under Alternative 5 would substantially reduce the number of vehicle trips that would normally be generated by the proposed new uses within Ames Research Center.

Proposed housing would reduce the gross number of daily trips by approximately 26 percent, and the gross number of peak hour trips by approximately 50 percent. More detailed discussion of project trip generation can be found in Section 4.3.

d. Mitigated Alternative 5: The Preferred Alternative

Under Mitigated Alternative 5, development would be the same as in Alternative 5 above, with several exceptions. In the NRP area, the land area of Parcel 1, which is proposed to accommodates the Lab Project proposed under the baseline, would be decreased. The development potential of this parcel would be kept the same through an increase in the parcel's allowed FAR. The land area of NRP Parcel 6, which is proposed for housing, would be increased, with a corresponding increase in its development potential. As well,

TABLE 2-13: **POPULATION SUMMARY**

	Alternative Two	Alternative Three	Alternative Four	Alternative Five	Mitigated Alternative Five*
EMPLOYMENT FORECAST					
Office/HD R&D	4,882	5,115	7,964	2,358	2,358
LD R&D/Indust	2,199	1,927	2,693	30	30
University	5,581	3,499	4,581	4,032	4,032
Public/Museum	106	106	106	115	115
Retail	100	150	70	347	214
Conf/Training	200	250	185	250	250
Recreation	0	0	0	40	40
Support	0	0	0	50	50
Total Employees	**13,068**	**11,047**	**15,599**	**7,222**	**7,088**
POPULATION FORECAST					
Townhome and Apartment Residents	1,634	891	2,286	2,228	3,349
Student Apartment and Dormitory Residents	376	376	288	580	1,560
Total Residents	**2,010**	**1,267**	**2,574**	**2,808**	**4,909**
Conference Guests	**200**	**250**	**185**	**250**	**250**

* See Chapter 5 for a full discussion of Mitigated Alternative 5.

Sources: NASA Research Park Planning Team; Bay Area Economics, 2001.

a portion of Buildings 19[5] and 20 would be redesignated for use as dormitory housing. This would be in keeping with the historic use of these buildings, which were originally built as enlisted men's and officer's housing respectively. Table 2-14 summarizes and Figure 2-6 shows the land use plan for Alternative 5.

In the Bay View area, the land area of Parcel 1, which is designated for housing development, would be increased, as would the parcel's allowed FAR. This would create the potential for a significantly larger housing development on the parcel. The land area of Parcel 2 would be decreased, resulting in a smaller development potential. Despite the increase in housing potential, there would still be room to increase the buffer between the wetlands and development, as called for in Mitigation Measure BIO-19 as added in this Final EIS. The buffer area would be increased by distributing the open space in Parcel 10 in a new configuration, while leaving Parcel 10's land area the same. Mitigated Alternative 5 would generate 7,088 new employees, approximately 3,000 students, 1,560 residents in the NRP area, 3,349 residents in the Bay View area, and 1,930 housing units within the study area. For a detailed analysis of Mitigated Alternative 5, see Chapter 5 of this Final Programmatic EIS.

D. Buildout, Analysis Horizon and Phasing

Given constraints imposed by the Clean Air Act, NASA will be limited to construction and operations that generate no more than 91,000 kilograms (100 tons) of ozone precursors per year. This will set a limit on the pace at which construction can occur, and NASA has calculated that buildout of the Preferred Alternative will take approximately 10 or 11 years. Assuming that construction under the NADP commences in 2003, this means that buildout of the Preferred Alternative would be completed no sooner than 2013.

[5] Part of Building 19 would remain office space.

Table 2-14: Potential Reconfiguration of Alternative 5 to Accommodate Additional Housing

Parcel		Land Use		Parcel Area (HECT)	Parcel Area (AC)	FAR	Developable Area (MS)	Developable Area (SF)
Ames Campus	1	ARC Facilities		89.03	*220.01*	0.31	277,748	*2,989,658*
	2	Preserve		3.15	*7.78*	N/A		*N/A*
	3	Recrea ion		1.62	*4.01*	N/A		*N/A*
		Sub Total		**93.8**	*231 8*		**277,748**	*2,989,658*
NASA Research Park	1	Lab Project	*	2.43	*6.00*	N/A	11,148	*120,000*
	2	Lab Project	*	7.90	*19.53*	0.71	55,742	*600,000*
	3	University Reserve		1.03	*2.53*	0.75	7,711	*83,000*
	4	Partner Parcel		1.50	*3.70*	0.18	2,661	*28,645*
	5	University Reserve		11.58	*28.60*	0.75	86,864	*935,000*
	6	University Reserve		3.81	*9.42*	1.15	43,850	*472,000*
	7	Computer Museum		1.26	*3.11*	0.88	11,148	*120,000*
	8	Partner Parcel		2.43	*6.00*	0.75	18,116	*195,000*
	9	Gateway Parcel		0.26	*0.65*	N/A	N/A	*N/A*
	10	Partner Shared		0.77	*1.91*	N/A	N/A	*N/A*
	11	Partner Shared		1.36	*3.35*	0.08	1,115	*12,000*
	12	Historic District	*	7.91	*19.55*	N/A	8,268	*89,000*
	12a	Historic District					17,280	*186,000*
	13	Historic District Infill		2.59	*6.40*	0.75	19,510	*210,000*
	14	Historic District Infill		0.87	*2.15*	0.27	2,323	*25,000*
	15	Historic District Infill		1.06	*2.62*	0.35	3,716	*40,000*
	16	Partner Parcel		1.85	*4.56*	0.35	6,503	*70,000*
	17	Historic Dist Reno		1.72	*4.26*	N/A	4,181	*45,000*
	18	C.Air & Space Cntr.		5.70	*14.09*	0.81	46,452	*500,000*
	19	Preserve		8.70	*21.50*	N/A	N/A	*N/A*
	X	No Change (H D)		N/A	*N/A*	N/A	869	*9,355*
		Sub Total		**64.7**	*159 9*		**347,457**	*3,740,000*
Eastside / Airfield	1	A/C Control Tower		0.19	*0.46*	0.60	1,114 8	*12,000*
	2	Preserve		9.82	*24.26*	N/A	N/A	*N/A*
	3	Open Space		59.53	*147.11*	N/A	N/A	*N/A*
	X	No Change		25.03	*61.84*	N/A	79,862.8	*859,636*
		Sub Total		**94.6**	*233.7*		**80,978**	*871,636*
	A	CANG Master Plan (EA)	**					
Bay View	1	Housing		9.33	*23.06*	1.19	111,019	*1,195,000*
	2	Education Reserve		0.93	*2.30*	0.48	4,459	*48,000*
	3	NASA Reserve		2.05	*5.06*	N/A	N/A	*N/A*
	4	Recrea ion		1.63	*4.02*	N/A	N/A	*N/A*
	5	Recrea ion		2.98	*7.37*	N/A	N/A	*N/A*
	6	Preserve		6.16	*15.22*	N/A	N/A	*N/A*
	7	Preserve		4.81	*11.89*	N/A	N/A	*N/A*
	8	Open Space		2.57	*6.35*	N/A	N/A	*N/A*
	9	Open Space		0.90	*2.23*	N/A	N/A	*N/A*
	10	Open Space		4.52	*11.17*	N/A	N/A	*N/A*
	11	Open Space		3.02	*7.46*	N/A	N/A	*N/A*
		Sub Total		**38.9**	*96.1*		**115,478**	*1,243,000*
Total							**821,662**	*8,844,294*
	A	CANG Master Plan(EA)	**	44.52	*110.00*	N/A	6,020	*64,800*
		Exis ing CANG Facilities		N/A	N/A	N/A	20,717	*223,000*

* *"Preapproved pursuant to the 1994 NASA/MFA Environmental Assessment - Comprehensive Use Plan"*

** *"Preapproved pursuant to the CANG EA Master Plan - Square footage not included in totals*

TABLE 2-15: **NEW USES UNDER MITIGATED ALTERNATIVE 5**

Location	Use	Square Meters	Square Feet
NRP Area:	Educational Uses	89,927	968,000
	Computer History Museum	11,148	120,000
	CASC	46,450	500,000
	Conference Center and Gym	25,548	275,000
	Housing:		
	810 150-800 sf units	59,458	640,000
	Office/High Density R&D	41,679	448,645
	Retail and Support Services	7,154	77,000
	Total New Uses in NRP Area:	**281,372***	**3,028,645**
Ames Campus Area:	Office/High Density R&D	46,450	500,000
	Total New Uses in Ames Campus Area:	**46,450**	**500,000**
Eastside/Airfield Area:	Control Tower	1,115	12,000
	Total New Uses in Eastside/ Airfield Area:	**1,115**	**12,000**
Bay View Area:	Housing: 1,120 1,000-1,300 sf units	111,020	1,195,000
	Retail, Child Care and Support Services	4,459	48,000
	Total New Uses in Bay View Area:	**115,479***	**1,243,000**
	Total New Uses Under Alternative 5:	**444,417***	**4,783,645**

* Numbers may not total due to rounding.

FIGURE 2.6

MITIGATED ALTERNATIVE FIVE

LEGEND:

- Partner Parcel
- Community Support
- University Reserve
- NASA Reserved
- Recreation
- Relocated AT Control Tower
- Housing - Bay View
- Housing - NRP
- California Air and Space Center
- Historic District Infill
- Historic District Renovation
- Historic Buildings
- Computer Museum
- Supporting Retail
- Light Rail
- Preserve (Burrowing Owl)
- Open Space
- Wetlands
- Fence Line
- Bay Trail Extension

Denotes Parcel Number as Noted on Table 2-14

- (1) Ames Campus
- (1) NASA Research Park
- (1) Eastside / Airfield
- (1) Bay View

* A portion of Building 19 will remain offices

DMJMH+N EDAW

0 76m 152m 305m
0 250ft 500ft 1000ft

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Based on these calculations, this EIS assumes that the buildout horizon for all alternatives would be 2013. The traffic, noise, air quality and infrastructure analyses all model the impacts of the alternatives as they would occur against predicted baseline conditions in 2013.

NASA has formulated a preliminary phasing schedule that breaks NRP development into four phases. The goal of NASA's phasing program is to tie together the number of employees and students on-site, amounts of housing to be constructed, and TDM program implementation. If targets are not met, development would not proceed to the next phase.

NASA's preliminary phasing of housing construction would be as follows:

- TDM Phase 1 - 25% of planned total housing units; 0-2,999 employees/ daytime students.
- TDM Phase 2 - 50% of planned total housing units; 3,000-5,999 employees/ daytime students.
- TDM Phase 3 - 75% of planned total housing units; 6,000-7,999 employees/ daytime students.
- TDM Phase 4 - 100% of planned total housing units; 8,000-9,966 employees/ daytime students.

Retail uses would be phased in as development proceeds. NASA would consider the construction of housing units over retail uses in the NRP area. The Building 19 housing conversion would take place after site contamination issues are resolved, and if the previously built housing is at least 90 percent occupied. NASA would also work with the Army on the use of the military housing, as mentioned in Mitigation Measure SOCIO-1a in this Final EIS. NASA is currently in discussion over allowing NASA substantial additional use of the family housing units. Currently, NASA has access to use up to twelve of their units. In addition, NASA hopes to gain access to a larger number of units exclusively for Ames Research Center. However, the military is working

on privatizing the housing and that may affect the amount of housing NASA can use in the future.

E. Cumulative Projects

This EIS evaluates the proposed NASA Ames Development Plan against conditions that are projected to occur in the future. This future condition includes both the baseline at Ames Research Center, as defined in Section A of this chapter, and other future projects outside of Ames Research Center, which are referred to as cumulative projects.

The cumulative analysis for this EIS is based on a list of specific projects that are currently proposed in adjoining communities, plus a percent increase to account for currently unforeseen future projects. The list of cumulative projects was developed in conjunction with the cities of Mountain View and Sunnyvale, and is shown in Table 2-16. These projects are not proposed by NASA, and the jurisdictions in which they are proposed will have the responsibility to prepare their environmental documentation. Additionally, the EIS assumes a background growth rate of 2 percent per year for the years through 2003 and 1 percent per year for each subsequent year over the course of the assessment period.

The City of Sunnyvale also has in place the Lockheed Master Use Permit (LMUP), which allows for 782,000 square meters (8.4 million square feet) of new construction on the site of Lockheed Missile and Space Company's Plant 1. Similarly, the City of Sunnyvale is currently preparing a Moffett Park Specific Plan (MPSP) which could allow for up to 1.24 million square meters (13.6 million square feet) of additional new development to the east of Moffett Field, of which 330,578 square meters (3.6 million square feet) is allowed today. Full buildout of the LMUP and MPSP are not specifically considered in the cumulative analysis since it is not known when or if these planning-level documents will be built out. However, all specific projects pending with the City of Sunnyvale and inside the Lockheed Master Use Permit and MPSP areas

are included in the cumulative analysis, and these projects are specifically labeled in Table 2-16. No projects other than those listed in Table 2-16 are currently proposed in the Lockheed or MPSP areas, so the remainders of the building areas allowed by the Lockheed Master Use Permit and MPSP are not included in the cumulative analysis. Other development that may occur under the LMUP and MPSP would be part of the background growth rates included in the cumulative analysis.

F. Projects Not Covered in this EIS or in the Cumulative Analysis

The following projects have been proposed by proponents other than NASA, but are not sufficiently far enough along in the planning stages to merit inclusion in the cumulative projects list shown in Table 2-16:

- **Relocation of the Commissary and Exchange.** Implementation of the NADP would require removal of the existing Commissary and Exchange, which are located in the NRP area. Replacement of these facilities would not occur under the NADP. If these facilities are replaced, it would occur only after preparation of separate NEPA documentation by the Department of Defense. However, trips associated with the potential new location of the Commissary and Exchange are included in the traffic analysis in order to provide for a conservative analysis.
- **Olympics**. A proposal has been put forward that would involve using Hangar 3 for the press during the Summer Olympics in 2012. In addition, the proposal includes use of the military housing areas as the Olympic Village. The Olympics proposal is not analyzed in this document.
- **Bay Trail Construction**. As described above in this chapter, NASA has agreed to grant an easement for the Bay Trail under the baseline for the proposed project. Construction of the segment of the Bay Trail along the northern border of ARC is not analyzed in this document.
- **Ferry Station**. The Water Transit Authority, which advocates for expanding ferry transportation on the San Francisco Bay, has proposed the

construction of a ferry station at Ames Research Center. Plans for the expansion of the ferry service are speculative at this point. The proposed ferry station has not been analyzed in this document.

— **Charleston Avenue Bridge**. Both the Santa Clara Valley Transportation Authority (VTA) and the City of Mountain View have proposed the construction of a bridge over Stevens Creek that would provide a connection between Ames Research Center and the Shoreline area. This proposal was analyzed as part of this EIS to determine its impact on NADP traffic patterns, as described in Chapter 4.3. However, the bridge was not included in any of the alternatives or in the list of future projects used for the cumulative impacts analysis.

— **Acquisition of Cargill Salt Ponds.** The Cargill Salt Ponds near Moffett Field have been purchased and turned over to the US Fish and Wildlife Service (USFWS). The USFWS will be conducting studies to determine which ponds will undergo tidal wetland restoration. This separate project is not considered in this EIS.

TABLE 2-16: **APPROVED AND PENDING PROJECTS IN MOUNTAIN VIEW AND SUNNYVALE**

Project Name	Use	Size	Status
CITY OF SUNNYVALE PROJECTS			
Town Center	Movie Theater	4,000 seats: 7,621 sm (82,000 sf)	Under construction
Olson Site	Shopping Center	5,295 sm (57,000 sf)	Under construction
Mozart	Office	41,805 sm (450,000 sf)	Under construction
Ariba	Office	60,512 sm (651,372 sf)	Under construction
Yahoo![1]	Office	74,041 sm (797,000 sf)	Under construction
Synopsys	Office	11,023 sm (118,650 sf)	Completed
Menlo Equities[1]	Office	24,990 sm (269,000 sf)	Pending
Juniper Networks[2]	Office	232,250 sm (2,500,000 sf)	Approved
Sandy Plaza	Office	7,043 sm (75,810 sf)	Completed
Phillips	Office	20,235 sm (217,810 sf)	Unknown
Ouye[2]	Office	9,410 sm (101,295 sf)	Pending
Office + Elks Lodge	Office Lodge	4,730 sm (50,919 sf) 1,456 sm (15,665 sf)	Approved
599 N. Mathilda Ave	Office	7,042 sm (75,810 sf)	Completed
TSH Arch. Office	Office	1,727 sm (18,600 sf)	Under construction
Network Appliance	Office	19,990 sm (215,186 sf)	Approved
Fox Auto Repair	Auto Care Ctr	780 sm (8,400 sf)	Approved
Classic Communities	Retail/Comm. Townhouse	2,043 sm (22,000 sf) 40 dwelling units (d.u.)	Pending
St. Mary Apts - Regis Homes	Apartments	32 d.u.	Under construction
Trammel Center	Apartments	124 d.u.	Under construction
First S.J. Housing	Apartments	30 d.u.	Completed
Stowell Site Citation Homes	Single Family	34 d.u.	Completed

[1] Moffett Park Specific Plan (MPSP) Area.
[2] Lockheed Master Use Permit (LMUP) Area.

TABLE 2-16: **APPROVED AND PENDING PROJECTS IN MOUNTAIN VIEW AND SUNNYVALE**

Project Name	Use	Size	Status[1]
CITY OF MOUNTAIN VIEW PROJECTS			
491 Fairchild	Office	1,380 sm (14,862 sf)	Completed (not occupied)
Fairchild, Veritas	R&D Retail	37,160 sm (400,000 sf) 2,322 sm (25,000 sf)	Completed
575 Middlefield	Office (Expansion)	6,847 sm (73,700 sf)	Approved
441 Logue	Warehouse to Office Conversion	2,954 sm (31,800 sf)	Approved
545 Whisman, 441-465	Office	36,788 sm (396,000 sf)	Approved
500 Feguson	Office	21,181 sm (228,000 sf)	Approved
313 Fairchild	Office	12,077 sm (130,000 sf)	Unknown
615 National	Office	1,783 sm (19,195 sf)	Approved
425 National	Office	3,262 sm (35,117 sf)	Approved
1200 Crittenden	Office	46,450 sm (500,000 sf)	Completed (125,000 sf not occupied)
1950 Charleston (Phase II)	Office	10,955 sm (117,924 sf)	Approved
400 Castro	Office Retail	13,272 sm (142,873 sf) 819 sm (8,820 sf)	Under construction
861 W. Dana	Office	5,202 sm (56,000 sf)	Under construction
401 Castro	Office	2,833 sm (30,500 sf)	10,160 retail, 20,340 office under construction
Bryant/Evelyn	Condos	44 d.u.	Completed
348 & 364 Bryant	Condos	20 d.u.	Under construction
2400 El Camino Real - Skyview	Multi-Family	211 d.u.	Under construction

[1] Source: Curtis Banks, Senior Planner, Community Development Department, City of Mountain View.

3 AFFECTED ENVIRONMENT

This chapter describes the baseline conditions of the built and natural environment that could be affected by the implementation of NASA's proposed NASA Ames Development Plan (NADP). The information in this chapter establishes a baseline against which to evaluate the potential environmental impacts of each of the four action alternatives for Ames Research Center, which are described below in *Chapter 4: Environmental Consequences*.

The following topics are addressed in this review of the affected environment:

- 3.1 Public Policy
- 3.2 Land Use
- 3.3 Traffic and Circulation
- 3.4 Air Quality
- 3.5 Infrastructure and Drainage
- 3.6 Services
- 3.7 Hazardous Materials and Site Contamination
- 3.8 Geology
- 3.9 Biological Resources
- 3.10 Noise
- 3.11 Aesthetics
- 3.12 Recreation
- 3.13 Cultural Resources
- 3.14 Socio-Economic Conditions

3.1 PUBLIC POLICY

The following section describes NASA and local policy relevant to planning and redevelopment at Ames Research Center.

While the Ames Research Center is federal property and therefore constitutionally exempt from the application of local land use plans and policies, NASA intends to cooperate with the cities of Sunnyvale and Mountain View and with Santa Clara County on matters of mutual concern. NASA also attempts, whenever possible, to meet local guidelines and standards in order to maintain cooperative relations with these municipalities.

Most of the Bay View area is on lands in which the federal government has a proprietary interest, meaning that it has no legislative jurisdiction. Typically, this status implies that a city or county would provide law enforcement and public safety services to these areas. However, in the case of Moffett Field, the Federal Government has historically provided those services in these areas, and anticipates continuing to do so in the future.

In areas under exclusive federal legislative jurisdiction, personal and real property are not subject to property, or *ad valorem* ("according to the value"), taxes regardless of whether the property is owned by the Federal Government or a non-Federal entity. As such, neither the Federal Government nor non-Federal entities operating under exclusive federal legislative jurisdiction are subject to possessory interest property tax. At Ames Research Center, non-Federal entities, including private corporations and non-profit private and state educational entities, will lease Federal land and construct buildings and other fixtures on-site, and so will not be subject to real or personal property taxes.

A. NASA Policies

Among the laws, plans and policies that guide the National Aeronautics and Space Administration's (NASA's) planning for the future of Ames Research Center are the National Aeronautics and Space Act of 1958 (42 U.S.C. § 2451 *et seq.*), the 1994 Comprehensive Use Plan (CUP) and its Environmental Assessment, and the NASA Ames Proposed Six Point Initiative. This section

of the EIS describes these three documents and their relevance to the current planning effort for Ames Research Center.

1. Space Act

The National Aeronautics and Space Act of 1958 is NASA's implementing legislation that sets its objectives, procedures, and policies. The Space Act focuses on the fundamental principles of the space program: that all activities in space should be peaceful and beneficial to mankind, that the general welfare and security of the United States depend on the development of aeronautical and space activities, and that NASA should have a unique competence in understanding and developing scientific and engineering systems.

In addition, the Space Act states that the aeronautical and space activities of the United States should be conducted so as to contribute materially to one or more of the following objectives:

- Devote space activities to peaceful purposes for the benefit of all mankind.
- Undertake aeronautical and space activities for the nation's welfare and security, and to expand human knowledge of the Earth and of phenomena in the atmosphere and space.
- Seek and encourage the fullest commercial use of space and make available discoveries that have military value or significance to agencies directly concerned with national defense.
- Improve the usefulness, performance, speed, safety, and efficiency of aeronautical and space vehicles.
- Develop and operate vehicles capable of carrying instruments, equipment, supplies, and living organisms through space.
- Preserve the role of the United States as a leader in aeronautical and space science and technology.
- Use the engineering and research resources of the United States effectively.

- Develop ground propulsion, advanced automobile propulsion, and bioengineering research, development and demonstration programs.
- Expand human knowledge of physiological and other human factors necessary to determine the human capacity to adapt to and perform effectively in a space environment.
- Provide for the widest practicable appropriate dissemination of information concerning its activities.[1]

In order to approve any project at Ames Research Center, NASA must find that the project would help to fulfill one or more of these objectives.

2. Comprehensive Use Plan and its Environmental Assessment

NASA's first plan for Ames Research Center after the closure of Naval Air Station (NAS) Moffett Field was the Comprehensive Use Plan (CUP). The CUP and its Environmental Assessment (EA) were adopted as official NASA policy in 1994. They were developed by NASA in order to effectively implement the transfer of the former NAS Moffett Field, with the exception of the military housing areas, which were transferred to the Department of Defense.

The 1994 CUP EA was approved with a mitigated Finding of No Significant Impact in 1994, and is the controlling environmental document for Ames Research Center until the NASA Research Park EIS ROD is signed. The preferred alternative it evaluates is a very general development program for Ames Research Center that does not set specific locations or programs for new buildings. Instead, the CUP proposes an envelope for development of Ames Research Center through the year 2010 with restrictions on population increase, traffic generation, square meters (square footage) developed, and emissions of airborne pollutants. The key restrictions from the CUP EA are that no more than 101,240 square meters (1,089,800 square feet) of new

[1] National Aeronautics and Space Act of 1958 (Public Law 85-568)

building space can be developed on up to 41 hectares (100 acres) of land. Allowed land uses include support for flight operations, research & development, administrative support, operational support, and personnel support, with more than ¾ of the new development devoted to R&D space. In combination with existing personnel at Ames Research Center, new development could lead to a total population of no more than 10,610 employees. Airfield operations could have returned to pre-transfer levels of up to 80,000 flights per year.[2] However, this has been reduced to 24,000 flights per year to accommodate air emission from the baseline construction. Any increase in flights above 24,000 per year would require environmental review and NEPA documentation.

NASA is currently in the design phase for approximately 72,000 square meters (777,000 new square feet) of building space under the CUP EA. This development is included in the baseline throughout this EIS.

3. NASA Ames Proposed Six Point Initiatives

In 1997, as the basis of a joint agreement with the Cities of Mountain View and Sunnyvale, NASA proposed six major initiatives endorsed by the Citizens Advisory Committee, described below in Section 5a. The initiatives were intended to guide development at Ames Research Center to ensure that it would be used in a manner consistent with NASA's mission. These initiatives were:

- Expand commercial space product development
- Expand the Ames Technology Commercialization Center (ATCC)
- Develop Information Technology Institutes(s)
- Develop Astrobiology Institute

[2] Moffett Field Comprehensive Plan, p.40-43, September 1994.

- Develop the California Air and Space Center (reuse of Hangar 1)
- Extend the Bay Trail through Ames Research Center along its northern border[3]

The Six Point Initiatives became the basis of a signed Memorandum of Understanding between the City of Mountain View, the City of Sunnyvale, and NASA regarding the future of Ames Research Center. This Memorandum of Understanding is discussed in detail in subsection E.2 of this chapter.

B. Santa Clara County Policies

Ames Research Center is located mostly in unincorporated Santa Clara County. While it is a federal facility and therefore not subject to the County's land use policies, NASA intends to cooperate with the County whenever possible. Therefore, a review of County land use policies is relevant to this EIS. The two components of Santa Clara County's land use policies that are most relevant to the Center are the County's General Plan and zoning regulations.

1. General Plan

The Santa Clara County General Plan 1995-2010 does not address policies for Ames Research Center directly. There are, however, various elements within the General Plan that relate to Ames Research Center.

a. Land Use Element

Land use policies determine how land can be developed and provide for the overall consistency and compatibility of land uses within the county.

[3] City of Mountain View Memorandum: *Presentation of the Final Report From the Joint Cities of Mountain View and Sunnyvale Community Advisory Committee on Moffett Federal Airfield*. p.5. July 10, 1997.

The Land Use Element of the Santa Clara County General Plan defines the Moffett Federal Airfield area as a "Transportation Facility," while the area west of the airfield is defined as a "Major Public Facility." According to the Plan, the designation "Transportation Facility" applies to airports, bus facilities, and storage yards for road maintenance equipment and supplies. The "Major Public Facility" designation applies to United States government lands used for defense and research, along with other large scale facilities belonging to state, federal or local governments. The General Plan does not attempt to regulate land use at Major Public Facilities, since they are exempt from local land use control.[4]

b. Transportation Element

The Transportation Element of the Santa Clara County General Plan focuses on various goals, strategies, and policies to improve the adequacy of the overall transportation system within the county. The following policies are relevant to planning for Ames Research Center:

- Policy C-TRY:
  Increase the proximity between housing and major employment areas to reduce commute distances and automobile dependancy by:
  - increasing the supply and affordability of units in the northern portions of the county, as well as increasing employment-related land uses in the southern portion of the metropolitan area;
  - applying the concepts of "balanced urban growth and development" in general to both the north and south valley areas;
  - encouraging developers and employers to build on-site or near-site housing for potential workers at a planned commercial or industrial site, the cost of which is matched to the workers' wages;

[4] Santa Clara County General Plan: *Land Use Policies*, Q-13.

- encouraging developers to provide pedestrian and bicycle paths that connect housing and employment sites so as to encourage walking and bicycling.

— Policy C-TR7:
Appropriate urban densities, mixed-use development patterns, and other aspects of urban development which support use of travel alternatives and reduce auto-dependancy should be employed along planned transportation corridors, within designated "urban activity centers," and within redeveloping areas of existing cities.

— Policy C-TR9:
Transportation Demand Management (TDM) measures should be employed to make more efficient use of existing road and highway capacity by increasing vehicle occupancy and reducing the need for commute and other trips. Such measures primarily include, but are not limited to the following:

- employer-based and school-based ridesharing programs
- vanpooling
- expanded use of flex-time and telecommuting
- public transit subsidies, reducing parking, and other "market" approaches

— Policy C-TR12:
It is the goal of this plan to achieve a level-of-service (LOS) no lower than D at peak travel periods on city streets, county roads, expressways, and state highways. However, in certain instances, a lower level of service may be acceptable when LOS D can not practically be achieved.

— Policy C-TR34:
Bicycling and walking should be encouraged and facilitated as energy conserving, non-polluting alternatives to automobile travel.

— Policy C-TR36:
Facilities should be provided to make bicycle and pedestrian travel more safe, direct, convenient and pleasant for commuting and other trips to activity centers and to support the use of other commute alternatives.[5]

c. Resource Conservation Element

The Resources Conservation Element includes a section on Heritage Resources including historical sites, structures, and areas; archeological and paleontological sites and artifacts; and historic and specimen trees. The Scenic Resources section, also within the Resource Conservation Element, is relevant to Ames Research Center. There are various strategies and policies within the Heritage Resources and Scenic Resources sections that are relevant to Ames Research Center.

— Policy C-RC49:
Cultural heritage resources within Santa Clara County should be preserved, restored wherever possible, and commemorated as appropriate for their scientific, cultural, historic and place values.

— Heritage Resources Strategy number 2:
Prevent or minimize adverse impacts on heritage resources.

— Policy C-RC60:
Hillsides, ridgelines, scenic transportation corridors, major county entryways, and other areas designated as being of specific scenic significance should receive additional consideration and protections due to their prominence, visibility, or symbolic value.

[5] Santa Clara County General Plan 1995-2010: *Transportation Chapter*: p. F1-F32.

— Policy C-RC61:
Public and private development and infrastructure located in areas of special scenic significance should not create major, lasting adverse visual impacts.[6]

d. Health and Safety Element

The Health and Safety Element includes sections on air quality, hazardous materials, noise, natural hazards, and aviation safety. Each of these sections has various strategies and policies that are relevant to Ames Research Center.

— Policy C-HS4:
Future growth and development countywide should be managed and accommodated in such a way that it:

" minimizes the cumulative impacts on local, regional, and trans-regional air quality; and

" reduces the general population exposure to levels prescribed by state and/or federal law for urban areas designated as non-attainment areas.

— Policy C-HS8:
Employer-based measures for transportation demand management (TDM) should be instituted to the maximum extent possible for large employers in both public and private sectors to encourage ridesharing and increase average vehicle occupancy rates, reduce peak hour congestion, and facilitate use of public transit.

— Policy C-HS9:
Employer-based ridesharing and TDM should be encouraged as mitigation for traffic generating impacts of new development.

— Hazardous Materials Strategy number 1:
Safely and efficiently manage hazardous materials.

[6] Santa Clara County General Plan 1995-2010: *Resource Conservation Chapter*, p. H1-H51.

- Policy C-HS14:
  All feasible measures to safely and effectively manage hazardous materials and site hazardous materials treatment facilities should be used, including complying with all federal and state mandates.
- Noise strategy number 1:
  Prevent or minimize noise conflicts.
- Policy C-HS24:
  Environments for all residents of Santa Clara County free from noises that jeopardize their health and well-being should be provided through measures which promote noise and land use compatibility.
- Policy C-HS25:
  Noise impacts from public and private projects should be mitigated.
- Policy C-HS26:
  New development in areas of noise impact (areas subject to sound levels of 55 DNL or greater) should be approved, denied, or conditioned so as to achieve a satisfactory noise level for those who will use or occupy the facility.
- Noise Strategy number 3:
  Minimize exposure to airport noise.
- Policy C-HS33:
  Development in areas of natural hazards should be designed, located, and otherwise regulated to reduce associated risks, by regulating the type, density, and placement of development where it will not:
  - be directly jeopardized by hazards
  - increase hazard potential
  - increase risks to neighboring properties

2. Zoning

According to the Santa Clara County zoning code, Ames Research Center is zoned a combination of A-1 general use , A agricultural, and CG general commercial.

The airfield area at Ames Research Center is zoned as A-1, general use. A general use zoning district allows for general residential and agricultural uses, and through the use permit process, allows for other uses and developments that are appropriate for a particular location, and are consistent with the objectives, goals and policies of the general plan.[7]

The area west of the airfield is zoned A, agriculture. The intent of an agriculture zoning district is to reserve those lands most suitable for agricultural production for agricultural uses, and to retain as open space those lands which may be suitable for future urbanization until such time as public facilities and services can be economically provided, consistent with community plans and objectives. Uses permitted as a matter of right have been found to comply with these criteria:

- The use must be compatible with and not substantially interfere with the continuation of any on or off-site agricultural operation.
- The use should not be of a sensitive nature that would itself be negatively impacted by any existing or future agricultural use on nearby parcels.
- The use will not require public urban service or infrastructure, or establishment of special districts or similar entities.
- The use should be consistent with the rural image of the agricultural area.
- Any new use should be sited to avoid taking the most viable agricultural lands out of active agricultural production (except as permitted elsewhere in this Article or in Article 36: Special Use Regulations).

[7] Santa Clara County Zoning Ordinance, Article 5. 1994

- Any new use should not significantly inhibit the future development of adjacent parcels consistent with General Plan land use designations of nearby cities.
- The use must clearly enhance the long term viability of local agriculture and agricultural lands.

Other uses are permitted within an agricultural zoning district as long as a special permit is secured, or the use is permitted upon securing Architectural and Site Approval, or a combination of these. However, Ames Research Center is not subject to this permitting requirement because it is a federal facility.[8]

A small strip of land within Ames Research Center adjacent to Highway 101 is zoned CG, general commercial. According to the zoning code, a general commercial zoning district is intended to "provide at readily accessible locations a wide variety of retail, service, and administrative establishments which are required to serve a large trading area population."[9] A general commercial zoning district is intended to be applied within urban service areas to appropriate commercial areas so designated by the applicable city general plan. A general commercial zoning district allows for commercial uses, subject to architectural and site approval. Other zoning uses are allowed as long as they are in accordance with the Santa Clara County General Plan and a special permit is obtained. [10] However, Ames Research Center is exempt from this permitting requirement because it is a federal facility.[11]

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[8] Santa Clara County Zoning Code, Chapter 19.22 p. 1

[9] County of Santa Clara Zoning Ordinance: *Article 20*, 1998.

[10] Ibid

[11] Santa Clara County Zoning Code, Chapter 19.22 p. 1

Figure 3.1-1 shows the Santa Clara County zoning designations for Ames Research Center.

3. Santa Clara County Airport Land Use Commission

The Santa Clara County Airport Land Use Commission (ALUC) is charged by the County Board of Supervisors with a variety of functions, including assisting local jurisdictions with planning for compatible land uses around airports, coordinating air transportation planning at the state, regional and local levels, and developing the County's airport land use plan.

Since NASA Ames Research Center is a federal facility, it is not subject to the jurisdiction of the County's ALUC. Although the ALUC may regulate development adjacent to Ames Research Center, none of the project area is within its jurisdiction.

C. City of Mountain View Policies

The City of Mountain View borders Ames Research Center to the south and west, and downtown Mountain View is located 2.4 kilometers (1.5 miles) from NASA's main gate. As shown in Figure 3.1-2, approximately 68 hectares (167 acres) of Ames Research Center is within the City of Mountain View.[12] Approximately 347 hectares (857 acres) of Ames Research Center is within Mountain View's Sphere of Influence.[13]

The City of Mountain View has developed a number of policies that are relevant to current planning efforts at Ames Research Center.

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[12] Nancy Hutar, Mountain View Planning Department, June 26, 2001.

[13] The Sphere of Influence of a city is the area that the Local Agency Formation Commission (LAFCO) has designated for potential future annexation by that city.

1. General Plan

The 1992 Mountain View General Plan states that it is, "imperative that any federal reuse of Ames Research Center occur in the context of close liaison with the City of Mountain View to ensure compatibility."[14] Mountain View policy is also strongly in favor of NASA control of Ames Research Center. General Plan Land Use Policy Number 24 explicitly supports NASA as an important institutional citizen of Mountain View. The General Plan outlines various actions that should be taken in order to support NASA's continued administration of Ames Research Center

a. Land Use Element

Land use policies determine how land can be developed and provide for the overall consistency and compatibility of land uses within a city.

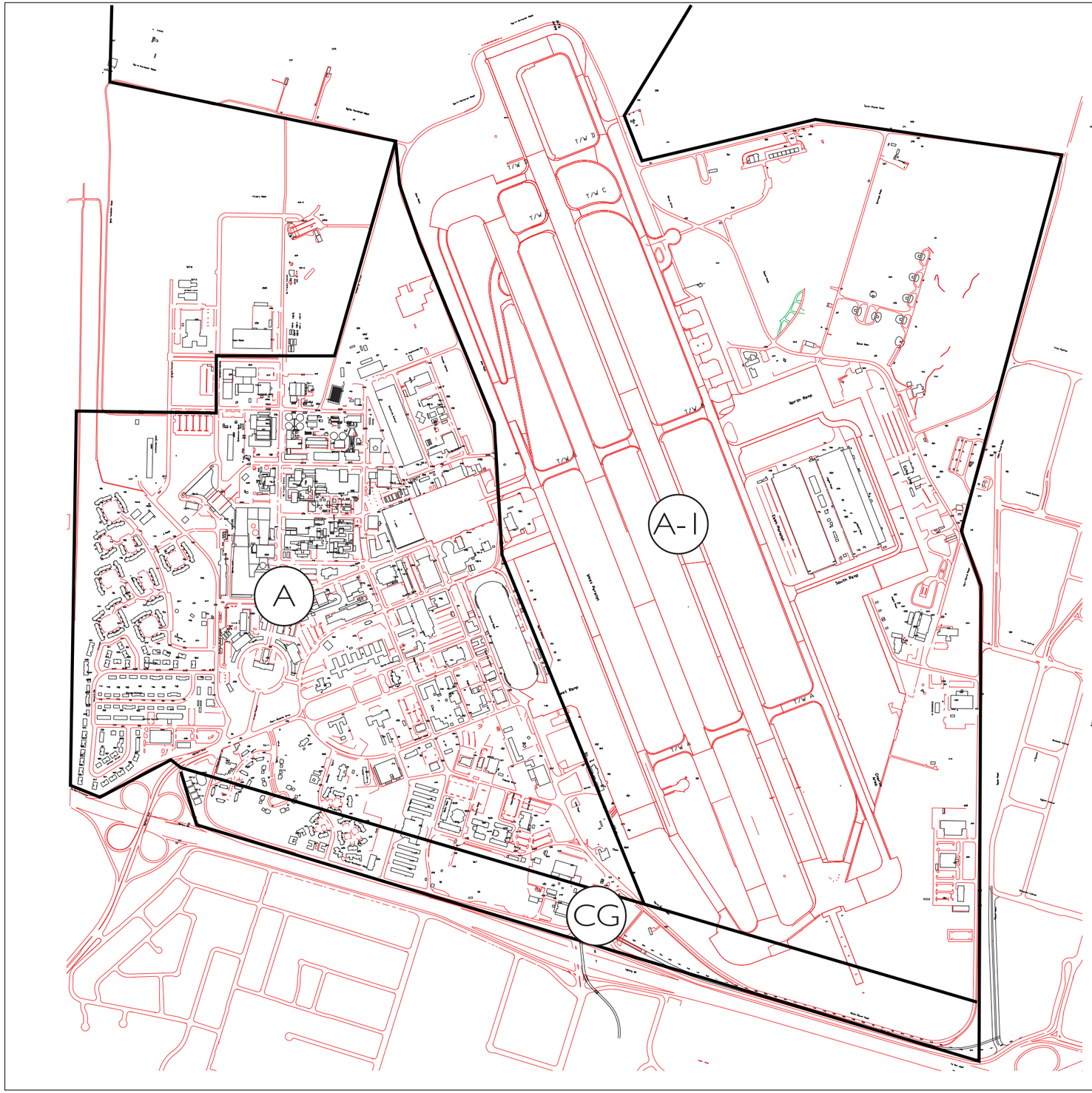
According to the Mountain View land use map, Ames Research Center is an "Institutional Facility." This designation is intended for public and quasi-public uses that serve an important regional function and are vital to Mountain View. The following policies are specific to Ames Research Center:

- Land Use Goal J:
  Support retaining and protecting the City's major institutional facilities.
  - Land Use Policy 23:
    Support NASA/Ames as the future federal operator of Ames Research Center.
  - Land Use Action 23a:
    Ensure that the reuse of Moffett is compatible with City goals, policies, and concerns through coordination with the new federal operator.
  - Land Use Action 23b:
    Monitor the Navy's short-term and long-term transition and clean-up of Ames Research Center.

[14] City of Mountain View 1992 General Plan.

FIGURE 3.1-1

SANTA CLARA COUNTY ZONING DESIGNATIONS



- (A) **Agriculture**
- (A-1) **General Use**
- (CG) **General Commercial**

N

0 76m 152m 305m

0 250ft 500ft 1000ft

- Land Use Action 23c:
  If Ames Research Center is declared surplus, develop a specific plan for the property in cooperation with NASA/Ames and the City of Sunnyvale.

— Land Use Action 24a:
Pursue a potential Air and Space Center as a cultural and educational resource and a public introduction to NASA.

— Land Use Action 24b:
Explore opportunities to reinforce NASA/Ames identification with Mountain View.

— Land Use Action 24c:
Pursue mutually beneficial efforts with NASA/Ames, such as facilitating Light Rail.

— Land Use Action 24d:
Pursue creation of a link between the North Bayshore area and the entrance to NASA/Ames.

In addition to the policy and actions listed above, the text of the Land Use Element of the General Plan contains various goals, actions, and policies that are relevant to Ames Research Center:[15]

— Land Use Goal A:
Promote a pattern of land use that protects the community's health and safety.

- Land Use Policy 1:
  Ensure that new development is built and located to minimize the dangers of flooding, airfield effects, earthquake hazards, and hazardous materials.

[15] City of Mountain View 1992 General Plan: *Community Development Chapter*, p. 11-50.

- Land Use Action 1a:
  Review development applications for consistency with guidelines established in Ames Research Center Air Installation and compatible Use Zone or other airfield safety guidelines.
- Land Use Policy 2:
  Minimize the risks from the use of hazardous materials.

— Land Use Goal B:
Preserve and strengthen Mountain View's identity.

- Land Use Policy 3:
  Emphasize entries to the City and special districts with features that create an original and positive impression.
- Land Use Policy 4:
  Protect significant landmark buildings and features and encourage new ones. (The NASA/Ames wind tunnels and Ames Research Center hangars are identified as landmarks for Mountain View).

— Land Use Goal D:
Encourage development that preserves the beauty of the natural environment.

- Land Use Policy 8:
  Promote the visibility of and safe physical access to San Francisco Bay, the baylands, Stevens Creek, and other natural resources in the City.
- Land Use Policy 9:
  Ensure compatible land uses next to the City's natural resources.
- Land Use Action 9a:
  Use the planning approval process to require mounds, landscaping, and other buffers in private development to protect natural resources from adjacent development.
- Land Use Policy 10:
  Preserve scenic views of the natural landscape.

- Land Use Action 10a:
  Use the development review process to ensure that the design, location, and size of new projects, whenever possible, preserve significant views of the mountains, Bay, wetlands, streams, and other natural resources in the City.
- Land Use Policy 11:
  Encourage building and site design that are compatible with the natural environment and features of the site.

— Land Use Goal G:
Protect Mountain View's historic buildings and districts and encourage their restoration.

- Land Use Action 17c:
  Pursue ways to preserve historic buildings and hangars at Ames Research Center.

— Land Use Goal I:
Cooperate with the school districts to provide educational opportunities.

- Land Use Policy 21:
  Encourage businesses and developers to provide and support childcare services.

— Land Use Goal O:
Preserve and enhance the quality of life enjoyed by residents of the San Francisco Bay Area.

- Land Use Policy 42:
  Strive for a better balance of jobs and housing units in Mountain View.

— Land Use Goal P:
Promote the opportunity to both work and live in Mountain View.

- Land Use Policy 43:

Investigate sites that have the potential to generate new housing, and amend the General Plan and zoning on these sites to residential use when appropriate.

- Land Use Goal Q:
  Coordinate the location, intensity, and mix of land uses with transportation resources.
  - Land Use Policy 44:
    Make land use decisions that support transportation alternatives to the automobile.
  - Land Use Action 44b:
    Prepare land use plans for the Light Rail corridor that will complement and enhance Light Rail use.
  - Land Use Action 44c:
    Work with property owners to facilitate joint development and use of land at Light Rail stations. (The Light Rail line extends from Ames Research Center, through the Middlefield industrial area, along Central Expressway, and into Downtown).
- Land Use Goal S:
  Maintain the predominant low building height in Mountain View, while allowing a limited number of well-designed tall buildings in selected areas of the City.

Figure 3.1-2 shows the General Plan land use designations for the City of Mountain View.

b. Circulation Element

The Circulation Element is concerned with the "movement of people and goods through and around the City." It focuses on the network of freeways, roads, and public transit, bicycle and pedestrian routes, with the goal of making that network as effective as possible while preserving quality of life and protecting the environment.

FIGURE 3.1-2

GENERAL PLAN
LAND USE DESIGNATIONS
UNDER THE MOUNTAIN VIEW
AND SUNNYVALE GENERAL PLANS

Residential:
- Low-density
- Mobilehome Park
- Medium-Low Density
- Medium-High Density
- High Density

Commercial/Office/Industrial:
- Neighborhood Commercial
- General Business
- Linear Commercial
- Industrial

Open Space/Recreation:
- Regional Park
- Agriculture
- Baylands

Public Facilities:
- Institutional
- Sphere of Influence
- City Limits
- ARC Boundary

N

0 76m 152m 305m

0 250ft 500ft 1000ft

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

The Circulation Element of the General Plan outlines various goals, actions, and policies that are relevant to Ames Research Center:[16]

- Land use and transportation are irrevocably connected. They must be carefully balanced as the City and the region continue to evolve.
- Single-passenger autos have strained the regional transportation system to its limits. Much greater emphasis must be placed on alternatives-ridesharing, bus and rail transit, bicycling, and walking.
- The harm that auto use causes to air quality will be a major force behind transportation policies over the next 15 years.
- Transportation facilities should be designed to serve all members of the community - children, seniors, the handicapped, and those who depend on bus and rail for mobility.
- Circulation Policy 4:
  Use peak-hour Level of Service D as the design standard for new or reconstructed streets, intersections, and traffic-control devices on arterials.
- Circulation Policy 6:
  Promote Transportation Demand Management Programs at work sites.
- Circulation Policy 8:
  Require new development to incorporate design features that will strengthen TDM programs.
- Circulation Policy 9:
  Support, where appropriate, improvements that will allow freeways and expressways to operate more efficiently.
  - Circulation Action 9a:
    Improve the U.S. 101/State Route 85 interchange, including modifying Shoreline Boulevard and Moffett Boulevard interchanges. This section of U.S. 101 is severely congested because the interchanges

[16] City of Mountain View 1992 General Plan: *Circulation Chapter*, p.51-78.

for Moffett Boulevard, State Route 85, and Shoreline Boulevard are so close together.

- Circulation Policy 10:
  Improve safety and traffic flow on streets and at congested intersections, where feasible.
- Circulation Policy 16:
  Participate actively with the County Transportation Agency in planning and carrying out the Light Rail Transit extension into Downtown Mountain View.
- Circulation Policy 17:
  Seek to improve access to rail transit in Mountain View.
- Circulation Policy 19:
  Seek to have the County Transit District provide bus service and bus stops wherever there is a demonstrated need in the City.
- Circulation Policy 23:
  Ensure that there is secure bicycle parking at centers of public and private activity.
- Circulation Policy 26:
  Provide a continuous system of sidewalks along streets.
- Circulation Policy 31:
  Reduce the negative effects caused by roadways and rail lines on visual quality, air quality, and noise.
- Circulation Policy 35:
  Ensure that people who are mobility-impaired can conveniently and safely move from parking lots to buildings and transportation boarding areas.

c. Residential Neighborhoods Element:

The intent of the Residential Neighborhoods Element is to preserve and protect the neighborhoods in Mountain View while finding ways to meet community and regional housing needs at the same time. The Residential Neighborhoods

Element outlines various goals, actions, and policies that are relevant to Ames Research Center:

- Neighborhood Goal B:
  Provide affordable housing in a number of locations, in a variety of house types and prices, for purchase and for rent.
  - Neighborhood Policy 2:
    Encourage housing on vacant infill residential land.
  - Neighborhood Policy 3:
    Encourage a mix of housing types, including higher density and lower density housing.

d. Environmental Management Element:

The Environmental Management Element defines the primary methods for putting the City of Mountain View's environmental policies into action. The following goals, actions, and policies found in the Environmental Management Element are relevant to Ames Research Center:

- Environmental Goal B:
  Improve open space areas to provide a diversity of recreational and leisure opportunities for the community.
  - Environmental Policy 3:
    Develop a system of urban trails in Mountain View.
  - Environmental Action 3a:
    Develop a trail along the banks of Stevens Creek.
- Environmental Goal E:
  Protect and improve air quality.
  - Environmental Policy 12:
    Participate in regional planning efforts to improve air quality.
  - Environmental Policy 13:
    Promote local efforts to improve air quality.

- Environmental Policy 15:
  Encourage activities that maintain and improve drinking water quality.
  - Environmental Action 15b:
    Continue to enforce local, State, and federal codes to prevent contamination of ground water resources.
- Environmental Policy 18:
  Recognize that water is a limited resource and encourage water conservation measures where possible.
  - Environmental Policy 20:
    Promote waste reduction methods throughout the City.
- Environmental Policy 23:
  Ensure the proper use, storage, and disposal of toxic chemicals to prevent soil contamination.
- Environmental Goal I:
  Preserve and enhance the diversity of biological resources in Mountain View.
  - Environmental Policy 25:
    Protect and restore plant and wildlife habitats.
  - Environmental Policy 26:
    Protect wildlife from the hazards of urbanization.
- Environmental Policy 20:
  Promote energy conservation.
- Environmental Policy 29:
  Encourage active and passive solar energy design in building and site development.
- Environmental Policy 31:
  Prepare for the destructive force of earthquakes and attempt to lessen their effects.

- Environmental Policy 38:
  For clean-up sites, ensure that hazardous materials are cleaned up before a property is developed or redeveloped.
- Environmental Goal O:
  Reduce noise levels at the source.
  - Environmental Policy 41:
    Restrict noise levels coming from stationary sources.
  - Environmental Action 41a:
    Maintain noise thresholds for each land use category.
  - Environmental Action 41d:
    Encourage NASA/Ames Research Center to reduce and control noise produced by its wind tunnels.
- Environmental Goal P:
  Protect people from the intrusion of noise.
  - Environmental Policy 43:
    Control the path of noise from the source to receiver.
  - Environmental Policy 44:
    Reduce the harmful effects of noise on people.
  - Environmental Action 44c:
    Respond to noise complaints by monitoring the source, suggesting noise mitigation measures, and using code enforcement options when necessary.[17]

2. Zoning

Since Ames Research Center is a federal facility it is not subject to the City's zoning code. The land to the west of Ames Research Center in Mountain View is zoned as public facility, agriculture, two-family residential, planned

[17] City of Mountain View 1992 General Plan: *Environmental Management Chapter*, p.105-143.

community, and general industrial. South of Ames Research Center, the land is zoned as public facility, agriculture, planned community, single-family residential, two-family residential, and multiple-family residential. To the west of North Whisman Road and south of Ames Research Center, the land is zoned as limited industrial.[18] Figure 3.1-3 shows the zoning designations for the land surrounding Ames Research Center.

3. Mountain View City Council Resolution

In July 1999, the Mountain View City Council adopted a resolution opposing the inclusion of Ames Research Center as a potential alternative airport location to be studied as part of the Regional Airport System Plan (RASP). According to the resolution, the City found the inclusion of Ames Research Center as an alternative airport location to be "speculative and inappropriate given the airfield's status as a secure Federal facility under the stewardship of the National Aeronautics and Space Administration (NASA) and also the initiatives NASA is pursuing for future use and development pursuant to the Moffett Community Advisory Committee process." [19]

D. City of Sunnyvale Policies

The City of Sunnyvale borders Ames Research Center to the south and east. Downtown Sunnyvale is located 3.2 kilometers (2 miles) from NASA's south gate. Approximately 400 hectares (1,000 acres) of Ames Research Center is within Sunnyvale's Sphere of Influence. Approximately 14 hectares (35 acres) of Ames Research Center is within Sunnyvale city limits. The City of Sunnyvale has a number of policies that are relevant to the current planning effort at Ames Research Center.

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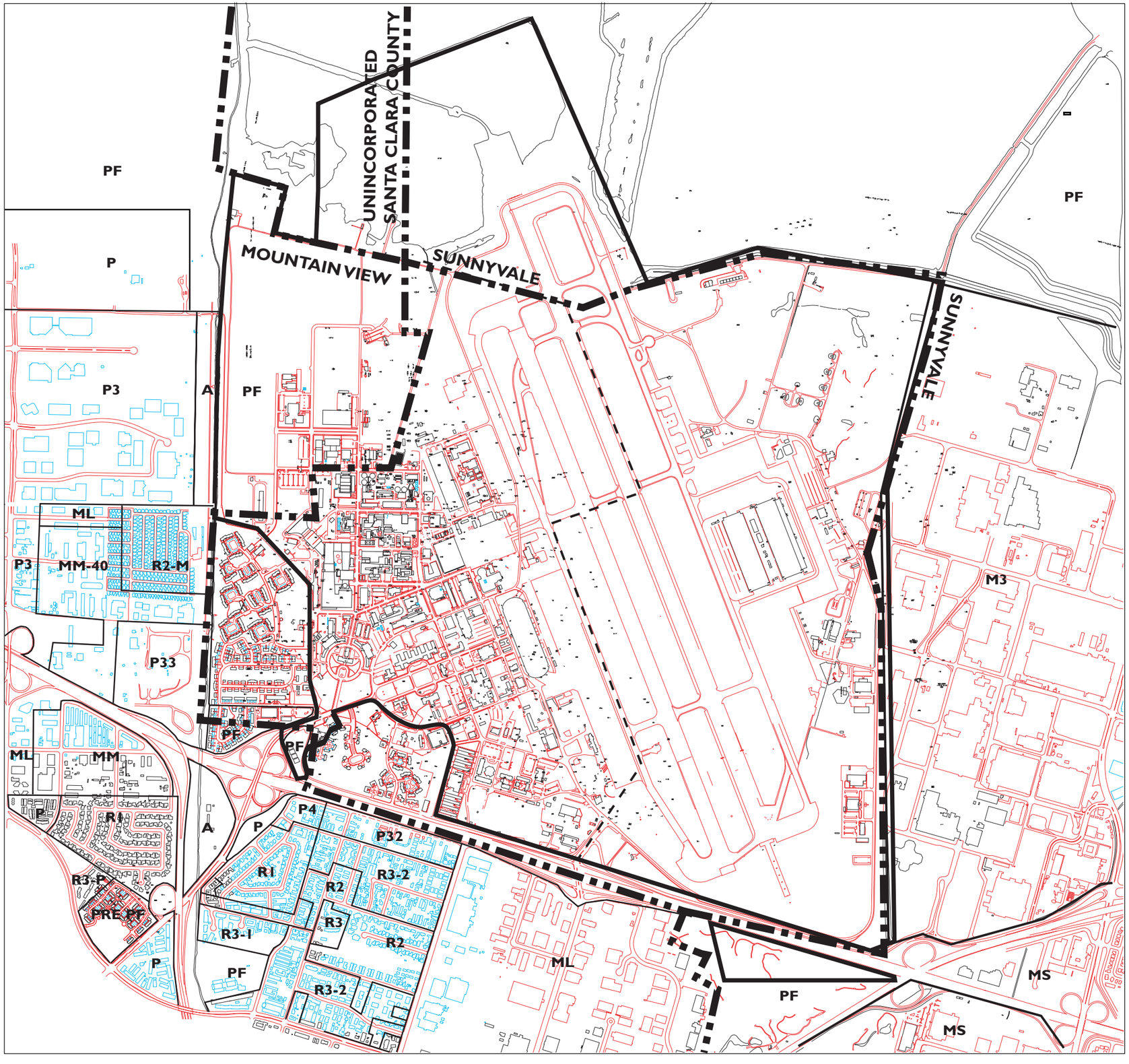
[18] City of Mountain View Zoning Map, 1990.

[19] City of Mountain View letter to the Regional Airport Planning Committee, July 16,1999.

FIGURE 3.1-3

ZONING MAP



A	Agriculture
M3	General Industrial
ML	Limited Industrial
MM	General Industrial
MS	Industrial and Service
P	Planned Community
P#	Precise Plans
PF	Public Facility
PRE	Unincorporated
R1	Single Family
R2	Two Family Residential
R2-M	Mobile Home Residential
R3	Multi-Family Residential
– – –	Sphere of Influence
▬ ▪ ▬	City Limits
▬▬	Ames Research Center Property Boundary

N

0 76m 152m 305m

0 250ft 500ft 1000ft

1. General Plan

According to the 1998 Sunnyvale General Plan, the use of Ames Research Center will continue to be a major issue for the City because of its size, location, and importance to the regional economy. Planning decisions should "establish and/or maintain a safe mix of aviation and land use for the areas affected by Ames Research Center." Under this policy, the City opposes joint civil/military aviation use of Ames Research Center. [20]

a. Land Use and Transportation Element

According to the Land Use and Transportation Element, decisions on the use of land determine the character of the community, its economic vitality, and the future demand for services. The Land Use and Transportation Element emphasizes four broad areas: appropriate housing, a strong economy, transportation efficiency, and community character.

The following goals and policies in the Land Use and Transportation Element of the Sunnyvale General Plan are relevant to Ames Research Center:

- Land Use and Transportation Policy C3.1:
  Achieve an operating level-of-service (LOS) of "D" or better on the city-wide roadways and intersections, as defined by the functional classification of the street system.
- Land Use and Transportation Policy R1.4:
  Achieve an operating level of service "E" or better for all regional roadways and intersections, as defined by the City functional classification of the street system.
- Land Use and Transportation Policy R1.3.2:
  Promote shorter commuter trips and ease congestion by advocating that all communities provide housing and employment opportunities.
- Land Use and Transportation Action N1.14.2:

[20] City of Sunnyvale General Plan: *Community Development Chapter*, section (2.4) p. 7, 1998.

Encourage carpooling to public and quasi-public services to minimize adverse traffic and parking impacts on neighborhoods.

- Land Use and Transportation Action N1.14.4:
  Encourage employers to provide on-site facilities such as usable open space, health club facilities, and child care where appropriate.
- Land Use and Transportation Action R1.9.2:
  Promote modes of travel and actions that reduce single occupant vehicle trips and trip lengths.
- Land Use and Transportation Action R1.10.2:
  Support alternative transportation services, such as light rail, buses, and commuter rail, through appropriate land use planning.
- Land Use and Transportation Action C3.5.4:
  Maximize the provision of bicycle and pedestrian facilities.
- Land Use and Transportation Action C3.5.6:
  Support an efficient and effective paratransit service and transportation facilities for people with special transportation needs.
- Land Use and Transportation Action R1.10.3:
  Encourage a mix of uses near transit centers.
- Land Use and Transportation Action C3.2.3:
  Encourage mixed use developments that provide pedestrian scale and transit oriented services and amenities.
- Land Use and Transportation Policy R1.12:
  Protect the quality of life for residents and businesses in Sunnyvale by actively participating in discussions and decisions on potential uses of Moffett Federal Airfield.
- Land Use and Transportation Action R1.12.1:
  Comprehensively review any proposed aviation services at Moffett that could increase aviation activity or noise exposure.
- Land Use and Transportation Action R1.12.3:

Pursue annexation of that portion of Moffett Federal Airfield within Sunnyvale's Sphere of Influence.

- Land Use and Transportation Action R1.12.2:
  Encourage appropriate uses that best support business and residents' desire in Sunnyvale.
- Land Use and Transportation Action C1.1.3:
  Require appropriate buffers, edges, and transition areas between dissimilar neighborhoods and land uses.
- Land Use and Transportation Policy N1.2:
  Require new development to be compatible with the neighborhood, adjacent land uses, and the transportation system.
- Land Use and Transportation Policy C4.4:
  Encourage sustainable industries that emphasize resource efficiency, environmental responsibility, and the prevention of pollution and waste.[21]

Figure 3.1-2 shows the General Plan land use designations for the City of Sunnyvale.

b. Open Space Sub-Element

The following goals and policies in the Open Space Sub-Element section of the General Plan are relevant to Ames Research Center:

- Open Space Policy 2.2B.2:
  Pursue the acquisition of federal lands currently located at the Moffett Naval Air Station.
- Open Space Policy 2.2B.2a:
  Secure title to the 14-hectare (35-acre) parcel currently leased from the Navy, which is part of the Sunnyvale Municipal Golf Course.

[21] City of Sunnyvale General Plan: *Land Use and Transportation Chapter*, section (2.1) , 1998.

— Open Space Goal 2F:
Encourage efforts by industrial and commercial enterprises in the City to preserve, develop, operate, and maintain open space and recreational facilities that are available to people who live, work or visit in Sunnyvale.[22]

c. Housing and Community Revitalization Element:

The Housing and Community Revitalization Element addresses housing issues and neighborhood quality, and attempts to preserve and enhance Sunnyvale's residential, commercial, and industrial areas. The following goals, policies, and actions within the Housing and Community Revitalization Element are relevant to Ames Research Center:

— Housing Policy 2.3A.1:
Continue to improve, if feasible, the existing housing to jobs ratio.

— Housing Policy 2.3A.2:
Continue to require office and industrial development above a certain intensity to mitigate the demand for housing or provide additional housing.

— Housing Goal 2.3C:
Promote and maintain a diversity in tenure, type, size, location, and cost-of-housing to permit a range of individual choice for all current residents and those expected to become City residents as a result of normal growth processes and employment opportunities.

— Housing Policy 2.3D.2:
Continue to ensure that handicapped persons have access to newly constructed residential developments when required by code and encourage similar access in renovated structures.[23]

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[22] City of Sunnyvale General Plan: *Community Development Chapter*, section (2.2), 1998.

[23] City of Sunnyvale General Plan: *Community Development Chapter*, section (2.3), 1998.

d. Seismic Safety Sub-Element

The Seismic Safety Sub-Element identifies major hazards in Sunnyvale such as earthquakes, fires, and floods. It evaluates existing protective services and suggests options the community might pursue to improve its level of public safety. Sunnyvale sits between two active earthquake fault systems (the San Andreas to the west and the Hayward/Calveras to the east), with other potentially active faults nearby.

The Seismic Safety Sub-Element includes various goals and policies relevant to Ames Research Center:

- Land Use Policy 2.4A.1:
  Evaluate and consider existing seismic potential hazards in developing land use policies. Make land use decisions based on an awareness of the hazards and potential hazards for the specific parcel of land.
- Hazardous Materials Policy 2.4A.3:
  Promote a living and working environment safe from exposure to hazardous materials.
  - Action 2.4A.3c:
    Monitor the work of the Naval Facilities Engineering Command, Western Division (San Bruno), to ensure proper environmental clean-up of Ames Research Center land.
- Aviation Policy 2.4A.4:
  Make planning decisions that establish and/or maintain a safe mix of aviation and land use for the areas affected by Ames Research Center.
  - Action 2.4A.4a:
    Oppose any effort to promote Ames Research Center for civil/general aviation. Consider the Air Installation Compatible Use Zone in

decisions concerning appropriate land use within the vicinity of Ames Research Center.[24]

e. Community Design Sub-Element:

The Community Design Sub-Element addresses the quality of the physical environment in Sunnyvale. The purpose of this sub-element is to establish design policies to guide future growth and enhance existing development. The following goals, policies, and actions are relevant to Ames Research Center:

- Community Design Policy 2.5A.2:
  Ensure that new development is compatible with the character of special districts and residential neighborhoods.
  - Community Design Action A2.5A.2a:
    Maintain design guidelines and policies for new construction in historic districts which define acceptable building styles, shapes, rooflines, colors, materials, fenestration and setbacks and develop new guidelines as needed.
  - Community Design Action 2.5A.2c:
    Continue to encourage infill development or redevelopment which is compatible with the use, density, setbacks, height and, where possible, the predominant building style and size of the surrounding district or neighborhood.
  - Community Design Action 2.5A.3c:
    Continue to preserve buildings with unique historic or architectural value.
- Community Design Policy 2.5B.2:
  Provide a safe and comfortable system of pedestrian and bicycle pathways.

[24] City of Sunnyvale General Plan: *Community Development Chapter*, section (2.4), 1998.

- Community Design Action 2.5B.2b:
  Consider studying alternatives or modifications to monolithic sidewalks to provide traffic buffers for pedestrians.
- Community Design Action 2.5B.2c:
  Consider installing street trees next to the curb along major thoroughfares with significant pedestrian activity or in special areas which would benefit from a unified landscape theme.
- Community Design Action 2.5B.2e:
  Consider installing benches or sidewalks where there are shady resting spots or scenic vistas.

— Community Design Action 2.5C.2a:
Encourage site design which preserves scenic vistas and maximizes solar orientation for heating and cooling.

— Community Design Action 2.5C.2b:
Continue to monitor and develop standards for the preservation of mature trees and landscaping and encourage the preservation of landscaping to be considered early in the site design.[25]

f. Environmental Management

The Environmental Management Element has six sub-elements which focus on water resources, solid waste management, sanitary sewer system, surface runoff, energy, noise, and air quality. The solid waste management section is not relevant to Ames Research Center. The following policies, goals, and action statements related to water resources, energy, noise, and air quality are relevant to Ames Research Center.

[25] City of Sunnyvale General Plan: *Community Development Chapter*, section (2.5), 1998.

- Water Action 3.1B.3a:
  Monitor all known underground contaminations
  - Water Action 3.1B.3b:
    Ensure responsible parties are taking all reasonable steps to clean up known underground contaminations.
- Sanitary Sewer System Goal 3.3A:
  Insure that the quantity and quality of wastes generated does not exceed the capabilities of the transportation and disposal facilities.
- Sanitary Sewer System Policy 3.3A.1:
  City shall provide for limitations on flow generated by new industries and enlargements to existing industries so that the total flow to the Water and Pollution Control Plant will not exceed the safe operating capacity of the plant but under no circumstances is it to exceed 29.5 MGD.
- Sanitary Sewer System Action 3.3A.1a:
  Monitor the generation of industrial wastes by new industries and enlargements of existing industries to insure that the safe treatment capacity is not exceeded at any time.
- Sanitary Sewer System Action 3.3A.1b:
  Enact a sewage discharge moratorium if the average flow to the Water Pollution Control Plant reaches 96 percent (4 percent safety factor) of design flow.
- Sanitary Sewer System Policy 3.3A.2:
  Insure that wastes discharged to the transportation system can be treated by existing treatment processes of the Water Pollution Control Plant.
- Surface Runoff Goal 3.4D:
  Minimize the quantity of runoff and discharge of pollutants to the maximum extent practicable by integrating surface runoff controls into new development and redevelopment land use decisions.
- Energy Goal 3.5A:
  Provide for safe and efficient vehicular movement on streets.

- Energy Policy 3.5B.3:
  Assure the provision of adequate bicycle support facilities at all major bicycle usage locations.
- Energy Policy 3.5B.4:
  Provide a pleasant and safe environment for pedestrian movement.
  - Energy Action 3.5B.4c:
    Separate pedestrian and vehicular traffic where feasible.
- Energy Goal 3.5C:
  Increasing ridesharing, the use of non-auto travel modes, and off peak traveling in order to reduce traffic congestion, energy consumption, and air pollution.
  - Energy Action 3.5C.1a:
    Encourage employers to establish internal carpool and vanpool programs, provide preferential parking for carpools, sell and/or subsidize transit passes for their employees, and establish flexible and/or staggered work hours.
- Energy Goal 3.5D:
  Reduce the consumption of energy through land use and design policies for new and substantially revitalized buildings.
- Energy Policy 3.5D.1:
  Encourage a built environment which uses the properties of nature for building heating and cooling.
- Energy Policy 3.5E.1:
  Promote the energy efficiency of existing buildings.
  - Energy Action 3.5E.1b:
    Encourage passive solar applications in existing buildings.
- Energy Goal 3.5F:
  Conserve energy through the conservation of potable water.

- Noise Goal 3.6A:
  Maintain or achieve a compatible noise environment for all land uses in the community (land use compatibility).
- Noise Policy 3.6A.1:
  Prevent significant noise impacts from new development by applying state noise guidelines and Sunnyvale Municipal Code noise regulations in the evaluation of land use issues and proposals.
  - Noise Action 3.6A.1a:
    Apply the Sunnyvale Municipal Code noise regulations in the evaluation of land uses and proposals. Acoustical analysis may be required to determine if mitigation measures shall be required for the new development. If required, mitigation measures shall be incorporated into the new development that bring the proposed development into conformance with the noise regulations in the Sunnyvale Municipal Code.
- Noise Policy 3.6B.2:
  Support efforts to reduce or mitigate airport noise.
  - Noise Action 3.6B.2a:
    Support the retention of the Airport Land Use Commission.
  - Noise Action 3.6B.2b:
    Support the right of private citizens to sue airports for noise impacts.
  - Noise Action 3.6B.2c:
    Encourage airport operation policies and procedures which reduce the level and frequency of noise as well as other policies and federal funding to alleviate the effects of aircraft noise.
- Noise Policy 3.6B.3:
  Support activities that will minimize the noise impacts of Moffett Federal Airfield.

- Noise Action 3.6B.3a:
  Monitor the annual number of flight operations and evaluate any increases in activity.
- Noise Action 3.6B.3b:
  Encourage NASA to seek ways to minimize flights over the community and manage practice landings.
- Noise Action 3.6B.3c:
  Encourage NASA to continue indirect flight operations over the Bay during evening and nighttime hours.
- Noise Action 3.6B.3d:
  Encourage NASA to continue flight, landing and maintenance procedures which lower noise levels.
- Noise Action 3.6B.3e:
  Encourage NASA to establish a complaint record and response program.
- Noise Action 3.6B.3f:
  Support the continuation of NASA's public information program.
- Noise Action 3.6B.3h:
  Support efforts to limit non-essential air traffic at Moffett Federal Airfield
- Noise Action 3.6B.3i:
  Support federal legislation that requires military and federal aircraft to meet Stage 3 noise requirements similar to commercial aircraft.

— Noise Policy 3.6B.5:
Encourage activities that limit the noise impacts of helicopters.

- Noise Action 3.6B.5a:
  Encourage NASA to direct helicopter flight operations and flight patterns so that they occur over industrial, not residential, areas.

- Air Quality Goal 3.7A:
  Improve Sunnyvale's Air Quality and reduce the exposure of its citizens to air pollutants.
- Air Quality Policy 3.7A.1:
  Require all new developments to utilize site planning to protect citizens from unnecessary exposure to air pollutants.
  - Air Quality Action 7A.2a:
    Develop and maintain a balanced transportation system in Sunnyvale by promoting pedestrian, bicycle and transit modes of travel.
- Air Quality Goal 3.7B:
  Reduce air pollution impacts from future development.
  - Air Quality Action 7B.1b:
    Promote mixed land use development that provides commercial services such as day care, restaurants, banks and stores near employment centers, reducing auto trip generation by promoting pedestrian travel.
- Air Quality Policy 3.7B.2:
  Assist employers in meeting requirements of Transportation Demand Management (TDM) plans for existing and future large employers and participate in the development of TDM plans for employment centers in Sunnyvale.
- Air Quality Policy 3.7B.3:
  Apply the Indirect Source Rule to new development with significant air quality impacts. Indirect Source review would cover commercial and residential projects as well as other land uses that produce or attract motor vehicle traffic.
  - Air Quality Action 3.7B.3a:
    Increase densities near transit stations.
  - Air Quality Action 7B.3b:
    Develop requirements for bicycle and pedestrian facilities.

- Air Quality Action 7B.3c:
  Require site design to encourage transit circulation and stops/waiting areas for transit and carpools.

— Air Quality Goal 3.7C:
Make a contribution towards improving regional air quality.

— Air Quality Policy 3.7B.2:
Improve opportunities for citizens to live and work in close proximity.

— Air Quality Policy 3.7C.3:
Contribute to a reduction in regional vehicle miles traveled.[26]

2. Zoning

Since Ames Research Center is a federal facility, it is not subject to the City's zoning code. The land in Sunnyvale to the east of Ames Research Center is zoned as general industrial. South of Ames Research Center, the land is zoned public facility and general industrial. Further east, approximately 1.6 kilometers (1 mile) past Ames Research Center, there is a mix of low-density residential, low medium-density residential, medium-density residential, and high-density residential zones.[27]

Figure 3.1-3 shows the zoning designations for the land surrounding Ames Research Center.

3. Moffett Park Specific Plan

In January, 2001, the Sunnyvale City Council authorized the preparation of a Specific Plan to guide the development of the Moffett Park Area in Sunnyvale. The Moffett Park Area is located in the northern portion of the City and contains approximately 464 hectares (1,160 acres) bounded by the Ames

[26] City of Sunnyvale General Plan: *Environmental Management Chapter*, section (3).

[27] City of Sunnyvale Zoning Map, 1998.

Research Center to the west, San Francisco Bay to the north, Highway 237 and US 101 Freeways to the south and Caribbean Drive to the east.

The General Plan and Zoning Code currently allow for up to 35 percent floor area ratio (FAR) in the Moffett Park Area for office and industrial uses and up to 50 percent FAR along the transit core. Under the existing General Plan, Moffett Park could develop up to 1.72 million square meters (18.5 million square feet). Currently, the City calculates that the area contains about 1.47 million square meters (15.9 million square feet) of space.

As part of the process to develop the Specific Plan for Moffett Park, the consultant for the City has developed nine alternatives for development. These alternatives are in addition to the No Project alternative, under which there would be no change to existing regulations.

- **Alternative One.** Alternative One would allow for up to 70 percent FAR along the expanded transit core and a 50 percent FAR throughout the remainder of Moffett Park. This would allow for up to 2.67 million square meters (28.8 million square feet) of development which would be the most intensive development option. This would increase the total allowed buildout in the area by 0.96 million square meters (10.3 million square feet), or 1.20 million square meters (12.9 million square feet) above existing conditions.
- **Alternative Two.** Alternative Two would allow for up to a 50 percent FAR throughout Moffett Park which would allow for up to 2.34 million square meters (25.2 million square feet) of development. This would increase the total allowed buildout in the area by 0.62 million square meters (6.7 million square feet), or 0.86 million square meters (9.3 million square feet) above existing conditions.
- **Alternative Three.** Alternative Three would allow for up to a 60 percent FAR along the expanded transit core and up to a 40 percent FAR throughout the remainder of Moffett Park. This would allow for up to 2.21 million square meters (23.8 million square feet) of development. This would increase the total allowed buildout in the area by 0.49 million

square meters (5.3 million square feet), or 0.73 million square meters (7.9 million square feet) above existing conditions.

- **Alternative Four.** Alternative Four would allow for up to a 55 percent FAR along the expanded transit core and a 40 percent FAR throughout the remainder of Moffett Park. This would allow for up to 2.13 million square meters (22.9 million square feet) of development. This would increase the total allowed buildout in the area by 0.41 million square meters (4.4 million square feet), or 0.65 million square meters (7.0 million square feet) above existing conditions.
- **Alternative Five.** Alternative Five would allow for up to a 55 percent FAR along the expanded transit core and a 35 percent FAR throughout the remainder of Moffett Park. This would allow for up to 1.98 million square meters (21.3 million square feet) of development. This would increase the total allowed buildout in the area by 0.26 million square meters (2.8 million square feet), or 0.50 million square meters (5.4 million square feet) above existing conditions.
- **Alternative Six.** Alternative Six would allow for up to a 55 percent FAR along the expanded transit core and a 40 percent FAR throughout the remainder of Moffett Park. In addition, two million square feet of floating development is proposed. This would allow for up to 2.31 million square meters (24.9 million square feet) of development. This would increase the total allowed buildout in the area by 0.59 million square meters (6.4 million square feet), or 0.84 million square meters (9.0 million square feet) above existing conditions.
- **Alternative Seven.** Alternative Seven would allow for up to a 55 percent FAR along the expanded transit core and a 35 percent FAR throughout the remainder of Moffett Park. In addition, two million square feet of floating development is proposed. This would allow for up to 2.16 million square meters (23.3 million square feet) of development. This would increase the total allowed buildout in the area by 0.45 million square

meters (4.8 million square feet), or 0.69 million square meters (7.4 million square feet) above existing conditions.

- **Alternative Eight.** Alternative Eight would have a commercial emphasis including "big box" commercial and higher intensity mixed-use office/commercial uses near transit stations. Commercial uses would also be located along Highway 237. The FAR throughout the remainder of Moffett Park would range from 35 to 50 percent, allowing for up to 1.73 million square meters (18.6 million square feet) of development. This would increase the total allowed buildout in the area by 9,920 square meters (100,000 square feet), or 250,000 square meters (2.7 million square feet) above existing conditions.
- **Alternative Nine.** Alternative Nine would have a residential emphasis including high density residential along with mixed-use and increased pedestrian amenities near transit stations. The FAR throughout the remainder of Moffett Park would range from 35 to 50 percent, allowing for up to 1.58 million square meters (17.1 million square feet) of development. This would reduce the total allowed buildout in the area by 130,000 square meters (1.4 million square feet), and would be 110,000 square meters (1.2 million square feet) above existing conditions.

This information was presented at the third Moffett Park Specific Plan Workshop held on October 10, 2001. These scenarios were refined and presented at another study session held by City Council at the end of November, 2001. The Draft Plan and EIR for the Moffett Park Specific Plan is expected to be completed by October 15, 2002. The anticipated adoption date of the Specific Plan is February 2003.[28]

[28] Erwin Ordonez, Associate Planner at the City of Sunnyvale Department of Community Development, October 11, 2001 and July 11, 2002.

4. Lockheed Master Use Permit

The Lockheed Master Use Permit was approved in December, 1994. The Master Use Permit functions as a Master Plan for a 555-acre site in northern Sunnyvale. The Master Permit guides all phases of development until 2024.

The project site is known as the Lockheed Missiles and Space Company's (LMSC's) Plant 1. The project site is bounded by the San Francisco Bay to the north, the Ames Research Center to the west, Mathilda Avenue to the east and Highway 237 to the south.

The Master Use Permit allows for a series of related development projects that would take place on the same piece of property, and which would be regulated by the Master Use Permit. The Master Use Permit pertains to improvements and additions to building and parking space, on-site circulation, potential provision of a transit center, landscaping, the option for a controlled access perimeter fence, and flood control and drainage improvements. The detailed site plan for the Master Use Permit proposes the addition of 2.9 million square feet of new building space. Office space will comprise 55 percent of new development while manufacturing buildings will comprise the other 45 percent. At total buildout, the site will have 78,200 square meters (8.4 million square feet) of building area at a floor area ratio of 0.35, the maximum allowed under the M-3 zoning designation.

E. Joint Planning Efforts

The Cities of Mountain View and Sunnyvale have engaged in joint planning efforts regarding Ames Research Center both with each other and with NASA. This section describes those joint planning initiatives.

1. Community Advisory Committee

When the decision was first made to decommission Moffett, Mountain View and Sunnyvale were concerned about how the former base would be reused. According to the federal law governing base closures, decommissioned bases

that are not transferred to other federal agencies can only be sold at fair market value for their highest and best use. Because Ames Research Center contained a large functioning airfield, it was widely assumed that it would be reused as a commercial airport. The only way to prevent this was to maintain federal control of the facility.

Mountain View and Sunnyvale were very concerned about the traffic, economic and noise impacts of a new commercial airfield, so they supported NASA's successful bid to take control of the facility. Once under NASA control, airfield use dropped to 24,000 flight operations a year.

NASA began looking for other uses of the airfield. NASA proposed to allow the Air Force to host the Civil Reserve Air Fleet (CRAF) program, a federal program that allows civilian cargo carriers to utilize federal installations during times of peace, with the understanding that in times of emergency or war their planes could be conscripted for federal use. The increased number of flights, well within the cap of 80,000 flight operations per year that NASA was entitled to, was unacceptable to the Cities of Sunnyvale and Mountain View. They convinced NASA to abandon this program, and in 1996 decided to convene a Community Advisory Committee (CAC) to suggest alternatives that would allow NASA to retain administration of Ames Research Center without increasing use of the airfield. The CAC consisted of 19 members: nine each from Mountain View and Sunnyvale, and one representing the Santa Clara County Cities Association.[29]

The CAC examined federal uses for Ames Research Center without limiting itself to the uses proposed in NASA's 1994 Comprehensive Use Plan, described in Chapter 1.

[29] Moffett Federal Airfield CAC Final Report

The CAC developed recommendations to the two City Councils through discussion and public input. The CAC came out in favor of NASA's Six Point Initiative (described on page 3.1-4), and developed recommendations including:

- The Cities of Mountain View and Sunnyvale should continue to work in concert with the NASA Ames Research Center to achieve the communities' desires.
- The Cities of Mountain View and Sunnyvale should continue to work with NASA in implementing its mission, and to provide ongoing community input on airfield operations. A Citizens Advisory Board and other methods may be used in accomplishing this broader goal.
- The Cities of Mountain View and Sunnyvale should assist NASA Ames Research Center in identifying and implementing the land use options as prioritized in this report.[30]

According to the Land Use Compatibility Summary, as determined by CAC consensus, the following land uses were determined to be 'generally acceptable':

- Air shows
- Information Technology Institute(s)
- Astrobiology Institute
- R&D Campus & Light Industrial Park
- Film Studios
- Air and Space Center
- Bay Trail Expansion
- Space Camp Expansion
- Additional Housing[31]

[30] Moffett Federal Airfield CAC Final Report, p. 5, 1997.

[31] Moffett Federal Airfield CAC Final Report, p.7, 1997.

Some potential land uses, such as an aircraft maintenance facility, a Coast Guard facility, wetlands expansion, and a golf course received less broad support from the CAC and were determined to be acceptable only with major qualifications, limiting conditions, or mitigating factors. Finally, a few uses were determined to be unacceptable: a warehouse distribution center, a new 49ers stadium, and a prison or youth correctional center.

The CAC's Summary Report and Recommendations includes a section on airfield operating parameters. The airfield operating parameters are the conditions or restrictions under which an airfield use could be considered at Moffett Federal Airfield:

- Controlled noise levels (especially at night)
- Controlled hours of operation (no night flights)
- Controlled flight patterns (approaches and take-offs over the Bay)
- Controlled bad weather flight operation procedures (no landings during inclement weather conditions)
- Defined level of community control.
- Controlled frequency and number of flights.
- Continued community input on operation procedures.
- No night-time engine testing[32]

The City of Mountain View and the City of Sunnyvale accepted the CAC recommendations with modifications as described below. Both Cities moved the CRAF/Air Cargo proposal from the "conditionally acceptable land uses" category to the "not acceptable land uses" category. The City of Mountain View also deleted the convention center/display hall and aircraft maintenance facility from the "conditionally acceptable land uses" category. The City of

[32] Moffett Federal Airfield CAC Final Report, p.13, 1997.

Sunnyvale chose to defer consideration of all conditionally acceptable land uses unless directed to do so by future council action.[33]

2. Moffett-Cities Agreement

In 1998, the City of Sunnyvale, the City of Mountain View, and NASA signed a Memorandum of Understanding which established a federal-local collaboration to seek to develop a shared-use research and development campus at Ames Research Center. NASA proposed the collaboration in order to enhance Ames Research Center's viability as a technological and economic resource for Silicon Valley and the federal government. The collaboration focuses on five priority areas:

- Pursue the establishment of a non-profit foundation for the California Air and Space Center at Moffett. Mountain View and Sunnyvale have pledged $200,000 each toward the planning and development of the Air and Space Center project.
- Facilitate the development of research institutes and joint ventures with information technology companies to pursue future technologies for aeronautic and space missions.
- Expand the Astrobiology Institute through relationships with various Bay Area universities and 'think tanks.'
- Expand the ATCC that serves as a small business incubator.
- Pursue a variety of revenue-producing partnerships involving government and commercial opportunities that support the mission of NASA.[34]

The agreement establishes a formal process for both cities to work with NASA to achieve these goals while balancing community concerns and NASA's needs.

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[33] City of Mountain View: *City Council Report*, Nov. 25, 1997 and the City of Sunnyvale: *City Council Minutes*, Nov. 25, 1997.

[34] Information obtained from internet on the Moffett-Cities Agreement, 1998.

F. Midpeninsula Regional Open Space District

The *Stevens Creek: A Plan of Opportunities*, *Comprehensive Use and Management Guidelines* describes a basic plan for the portion of the creek adjacent to Shoreline Park and is aimed at integrating Shoreline Park with the creek and the marsh refuge of the Midpeninsula Regional Open Space District (MROSD) within a uniform concept for flood protection, recreational use, and public access.

In order to create a strong functional and physical relationship between the creek, Shoreline Park, and the MROSD's marsh preserve, the plan proposes that the linear dikes on the east and west side of the creek be breached to create a broad, common marshland restoration area. The plan acknowledges that, although breach of the east side levee would allow incorporation of the MROSD marsh refuge into the channel scheme, some flood containment to the east of the refuge may be necessary. Levees could be designed to maximize public use of the marsh refuge area.

G. City of San Jose General Plan

Ames Research Center is approximately 1.6 kilometers (one mile) from the northern edge of the City of San Jose, which requested that this EIS include an analysis of policies of the City of San Jose relevant to the project.

None of the proposed project area is within the City of San Jose, and the City of San Jose General Plan does not contain any goals or policies that refer directly to Ames Research Center or Moffett Field.

San Jose City Council Resolution 66096, dated June 27, 1995, urged the federal government to continue the then-current operations of Moffett Field and Ames Research Center. The resolution also stated that, if federal operation of Moffett Field is discontinued, the City will seek to ensure that the facility is retained as a civil airfield.

H. Bay Conservation and Development Commission Bay Plan

The Bay Conservation and Development Commission (BCDC) is a State-created regional agency with jurisdiction over land uses adjacent to San Francisco Bay, whose authority was created by the McAteer-Petris Act. The BCDC's *San Francisco Bay Plan* contains both the Commission's enforceable policies regarding future uses of the Bay and shoreline, and also includes Bay Plan Maps on which it designates shoreline areas reserved for high priority uses such as airports and seaports.

The federal Coastal Zone Management Act requires federal actions that affect the coastal zone to be consistent, to the maximum extent practicable, with approved State or local coastal zone plans. The BCDC's Bay Plan is the approved coastal zone plan for the San Francisco Bay Area. Bay Plan Map 7 designates Moffett Field as an "Airport Priority Use Area." A conclusion of the Bay Plan is that there are only limited areas of shoreline suitable for "priority uses" such as airports, water-related industries, or wildlife refuges, and that these areas should be reserved specifically for those uses.

The Plan Map policy note regarding this area supports consideration of commercial aviation at Moffett Field when restricted military use is no longer needed. The note also states that Moffett Naval Air Station is not within BCDC permit jurisdiction.

I. MTC 1994 Regional Airport System Plan

The Metropolitan Transportation Commission (MTC) is designated by the federal Secretary of Transportation as the metropolitan planning organization for the nine-county San Francisco Bay area.[35] MTC's *Regional Airport System*

[35] Randy Rentschler, Manager, Legislation and Public Affairs, MTC. Personal communication, May 21, 2002.

Plan (RASP), which was updated in 2000, retains a regional interest in potential civil aviation use of Moffett Field. Specifically, Recommendation 6 of the RASP recommends that the plan "protect future options by indicating a regional interest in civil aviation use of ....Moffett Federal Airfield if th(is) facility becomes available in the future". Recommendation 6 further states that decisions that could foreclose future use of any airfield should be subjected to a focused study on the effect of such closure on local and regional aviation requirements.

3.2 LAND USE

This section describes land uses within Ames Research Center as a whole, and in the surrounding area. It also includes a discussion of existing conditions relative to airfield land uses.

A. Ames Research Center

Ames Research Center consists of the 752-hectare (1,857-acre) NASA-administered portion of the former NAS Moffett Field and the original NASA Ames Campus. Ames Research Center is composed of the original Ames Research Center campus, the airfield, airfield support facilities, barracks, support facilities for current and former military personnel, and open space. The portion of Moffett Field not under NASA control consists of two Department of Defense-administered housing areas. The first of these is the Berry Court Military Housing area, which lies between Dailey Road and the Space Camp compound and contains 111 units of housing on approximately 17 hectares (43 acres). The Orion Park Military Housing area lies just west of Ames Research Center and contains 567 units of housing on approximately 31 hectares (76 acres).

For purposes of this EIS, Ames Research Center has been divided into four major planning areas: the 86-hectare (213-acre) NASA Research Park (NRP), the 95-hectare (234-acre) Ames Campus, the 385-hectare (952-acre) Eastside/Airfield, and the 38-hectare (95-acre) Bay View area. The remaining 144 hectares (357 acres) of NASA-administered land consists of wetlands areas along the northern boundary of Ames Research Center. Figure 3.2-1 shows the land uses within Ames Research Center.

1. NASA Research Park

The NASA Research Park consists of 86 hectares (213 acres) of land on the southwest edge of Ames Research Center. This area includes 29 hectares (72 acres) of the Shenandoah Plaza National Historic District, which is the entire Historic District except for Hangars 2 and 3, which are in the Eastside/Airfield area. The NRP area lies adjacent to the Ames Campus and Eastside/Airfield areas. Current uses include office, R&D, retail, business services, barracks,

vehicle maintenance facilities, airfield operations, and storage. There are also 9 hectares (22 acres) of burrowing owl habitat adjacent to the airfield which are considered non-developable. There are approximately 5.6 hectares (14 acres) of active open space.

2. Ames Campus

The Ames Campus area encompasses 95 hectares (234 acres) in the northwest portion of Ames Research Center. The Ames Campus Area contains 40 major technical facilities and laboratories, and 48 other major supporting and administrative buildings and structures. Current programs of the Ames Campus are directed toward research and development in aeronautics, life and space sciences, and information technology.

3. Eastside/Airfield

The Eastside/Airfield area consists of 385 hectares (952 acres) on the east side of Ames Research Center. The primary land use in the Eastside/Airfield area is the runway, which is currently utilized by the California Air National Guard, ARC aircraft, and aircraft from other federal entities. Hangars 2 and 3, which are part of the Shenandoah Plaza National Historic District, are in this area.

4. Bay View

The Bay View area consists of 38 hectares (95 acres) on the northwest edge of Ames Research Center. The Bay View area is currently undeveloped, and is composed primarily of non-native grassland.

B. Surrounding Land Uses

1. Existing Land Uses

Land uses in the area surrounding Ames Research Center are a mix of industrial, office, residential, agricultural, and park uses. These land uses are illustrated in Figure 3.2-1, and described below:

FIGURE 3.2-1

EXISTING LAND USE

1. NASA R&D
2. Fuel Operations
3. Operations & Maintenance
4. Recreation
5. Public / Educational
6. Administration/Training
7. Open Space and Wetlands
8. Personnel Services
9. Administration/Billeting
10. Commercial
11. Housing
12. Airfield Operations
13. NASA Admin
14. Golf Course
15. Undeveloped Land/ Burrowing Owl Habitat
16. R&D, Office, Light-Industrial
17. Agricultural
18. Residential: Mix of Densities
19. High-Density Residential
20. Ordnance Storage

N

0 76m 152m 305m

0 250ft 500ft 1000ft

- Stevens Creek and the recreational trail that runs along the levee beside it lie immediately west of Ames Research Center. The central portion of the Creek is bordered by a strip of agricultural land that is used as a Christmas tree farm.
- Further to the northwest are a mixture of office and light industrial buildings, with some supporting commercial, retail and entertainment services on the north side of Shoreline Boulevard.
- Directly west of Ames Research Center is a large mobile home park with approximately 358 units.
- South of Ames Research Center and Highway 101 are a wide variety of uses, including general light industrial, office, commercial, and residential. Residential uses are a mixture of high-density multi-family units and detached single family homes.
- Southwest of Ames Research Center, just below the Highway 85 and Highway 101 interchange, is a regional park. Across Highway 85 to the west of the park is low-density residential and general industrial land.
- Southeast of Ames Research Center is the Sunnyvale Municipal Golf Course, which is dedicated as park land. 14 hectares (35 acres) of the Sunnyvale Municipal Golf Course belongs to Ames Research Center. Further south of the golf course, there is a mix of industrial and medium-density residential land uses.
- The area immediately to the east of Ames Research Center is characterized by industrial and office uses. Beyond it, uses include low- and medium-density residential and general business.
- Midpeninsula Regional Open Space District's Stevens Creek Nature Study Area is adjacent to the northwest corner of Ames Research Center. It consists of pickleweed salt marsh and open water (stormwater retention pond) habitat.
- Open space and recreational land uses surrounding Ames Research Center include the Bay Trail, the Stevens Creek Regional Trail, the Shoreline

Amphitheater, various neighborhood parks, a golf course, and several private recreational areas.[1]

2. Planned Cumulative Land Uses

This section describes new uses planned in the area surrounding Ames Research Center under cumulative conditions.

a. Mountain View

There are a number of planned developments within the City of Mountain View that will be in close proximity to Ames Research Center. A new development with approximately 46,000 square meters (500,000 square feet) of office and R&D space is under construction within the North Bayshore Land Use Study Area directly west of Ames Research Center. The existing sanitary landfill just west of this new development will eventually become a recreational site. The remainder of the North Bayshore Land Use Study Area consists primarily of parking for the Shoreline Amphitheatre. Currently, the City of Mountain View has no plans to develop these lots.

There are a number of other planned office and R&D developments that will be located in close proximity to Ames Research Center in the area north of Highway 101 between North Shoreline Boulevard and Ames Research Center. Current plans include over 93,000 square meters (1 million square feet) of office and R&D space. Across Highway 101 to the south in the Middlefield/Ellis/Whisman office and light industrial area, an additional 56,000 square meters (600,000 square feet) of new office and R&D space is planned, including a small amount of retail space.[2]

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[1] Information derived from the City of Mountain View Land Use Map, the City of Sunnyvale Land Use Map, and the NASA Ames Aerodynamics Testing Program Final Environmental Impact Statement, p.40-47, October 1998.

[2] Brad Eckhardt, Senior Planner with the City of Mountain View Planning Department, 11-1-99.

b. Sunnyvale

The City of Sunnyvale is planning a number of R&D, office and R&D, and industrial developments that will be located east of Ames Research Center, and south of Highway 101 next to the Sunnyvale Municipal Golf Course. To the east, just over 37,000 square meters (400,000 square feet) of office, R&D, and industrial development is currently being planned within and adjacent to Lockheed Martin. To the south of Ames Research Center, another 37,000 square meters (400,000 square feet) of new office and R&D space is also in the planning stages.

c. Midpeninsula Regional Open Space District

Midpeninsula Regional Open Space District (MROSD) plans to restore the currently diked Stevens Creek Nature Study Area to tidal flow.

C. Airfield Compatibility

Moffett Federal Airfield is owned by NASA and is currently used by NASA and CANG, with some limited use by other Department of Defense agencies. Since taking over the Airfield from the Navy, NASA has primarily used the facility for Rotorcraft and transient research aircraft.

Ames Research Center has applied Federal Aviation Administration (FAA) civilian standards to determine adjacent land uses and airport operating clearances for Moffett Field. The controlling documentation regarding such clearances and design criteria are based on FAA Regulations Part 77. The following regulations govern other aspects of airfield operations:

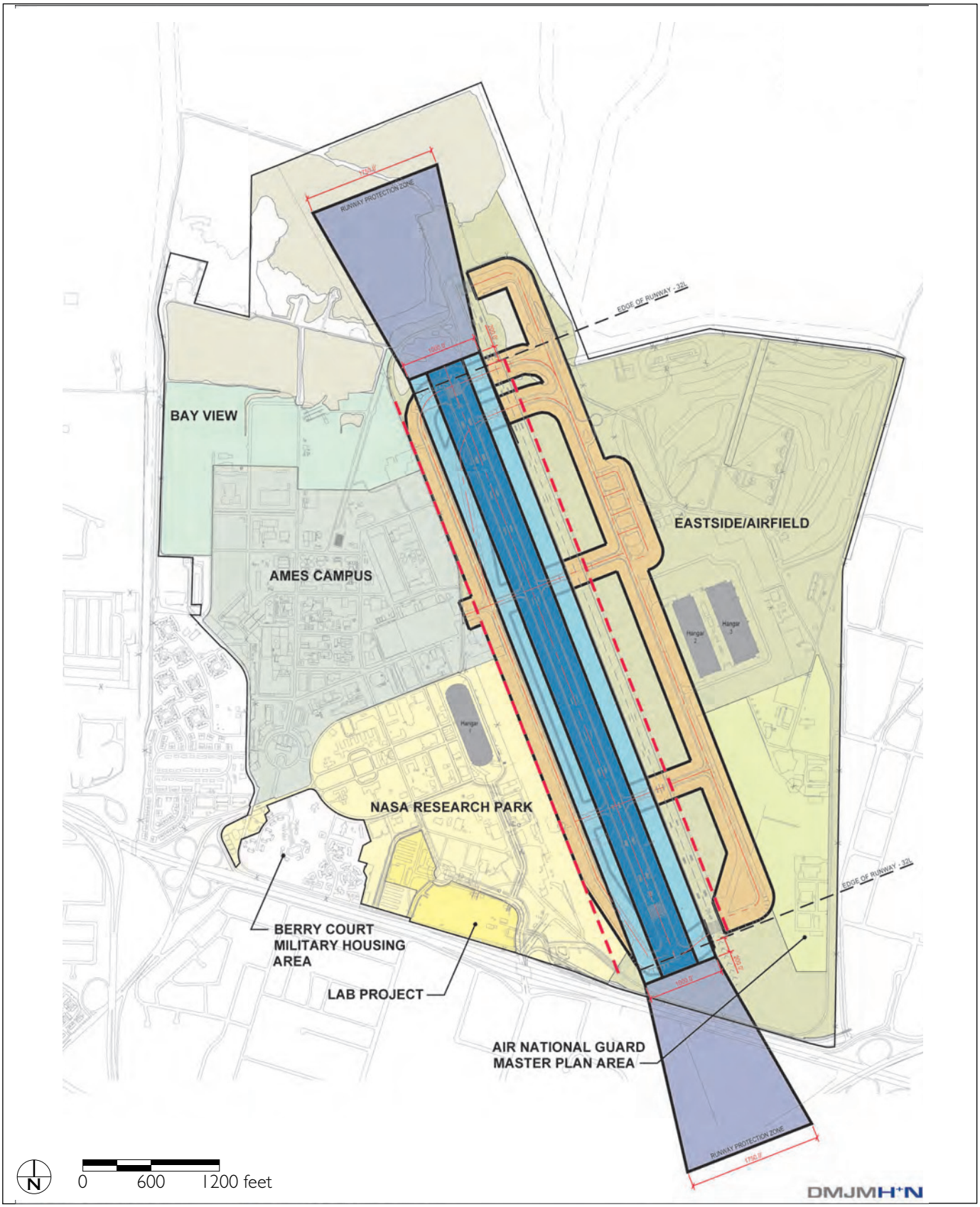
- Part 99, which covers security control of air traffic
- Part 150, which governs airport noise compatibility planning and contains both Noise Exposure Maps and a Noise Compatibility Program to reduce and prevent noise exposure impacts.

In addition, Moffett Federal Airfield generally operates in accordance with FAR Part 139, which describes the procedures, standards, equipment, facilities, and personnel the airfield would need to maintain to be certified under Part 139. However, Moffett Federal Airfield is not currently certified under FAR Part 139, nor is it required to be.

FAR Part 77 sets out a number of minimum operating clearances, based on the runway centerline and the wingspan of the largest aircraft expected to use the airfield, which establish runway protection zones, runway safety zones, and taxiway Object Free Areas. These areas, shown in Figures 3.2-2 and 3.2-3, delineate areas on the ground which must be kept clear of structures or any other obstruction.

In addition, Part 77 addresses maximum building heights adjacent to the runways. Specifically, no obstruction may penetrate the "Transitional Surface," which is determined by calculating a slope of 7:1 extending from the edge of the "Primary Surface," which is an imaginary surface extending 152 meters (500 feet) on either side of the centerline of the runway. For example, building heights at the western edge of NRP Parcels 7 and 8 may not exceed 22 meters (73 feet), according to the transitional surface slope. At the eastern edge of the parcels, building heights may not exceed 120 feet. Furthermore, no buildings may be constructed within the "Building Restriction Line," which is located 234 meters (769 feet) from the centerline of the runway, and the taxiway Object Free Area prohibits the placement of buildings within 59 meters (193 feet) of the taxiway centerline. The Transitional Surface, Primary Surface, and Building Restriction Line are all shown in Figure 3.2-4.

Moffett Federal Airfield currently operates in accordance with these requirements, with the exception of Hangars 1, 2, and 3. However, because these hangars were constructed before Part 77 regulations were adopted, and because of their status as historic resources, there are no plans to alter the hangars in order to comply with Part 77.



Runway Protection Zone

The Primary Surface

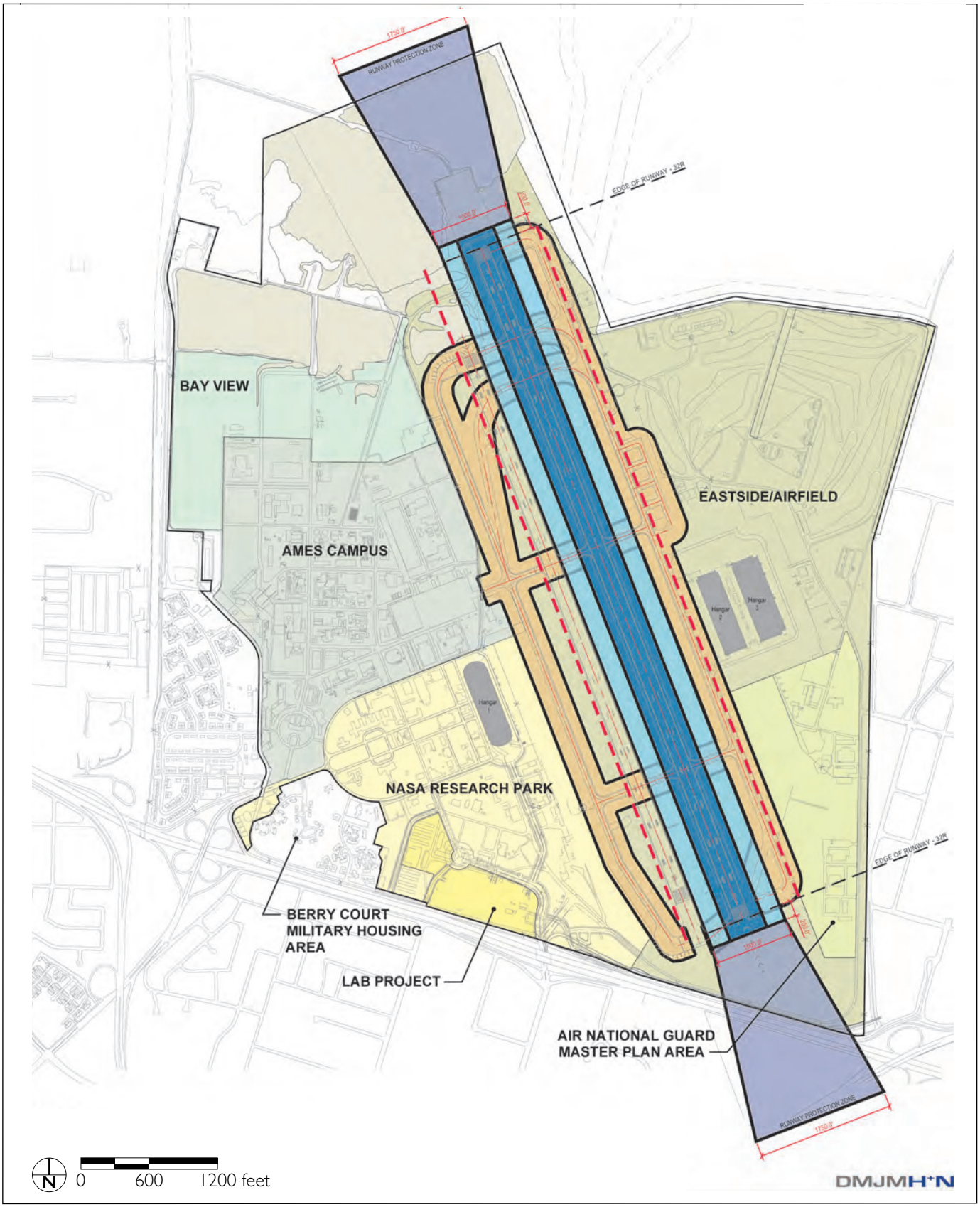
Runway Safety Zone

Taxiway Object Free Area

Building Restriction Line

FIGURE 3.2-2

MINIMUM OPERATING CLEARANCES RUNWAY 32 LEFT



Runway Protection Zone

The Primary Surface

Runway Safety Zone

Taxiway Object Free Area

Building Restriction Line

FIGURE 3.2-3

MINIMUM OPERATING CLEARANCES RUNWAY 32 RIGHT

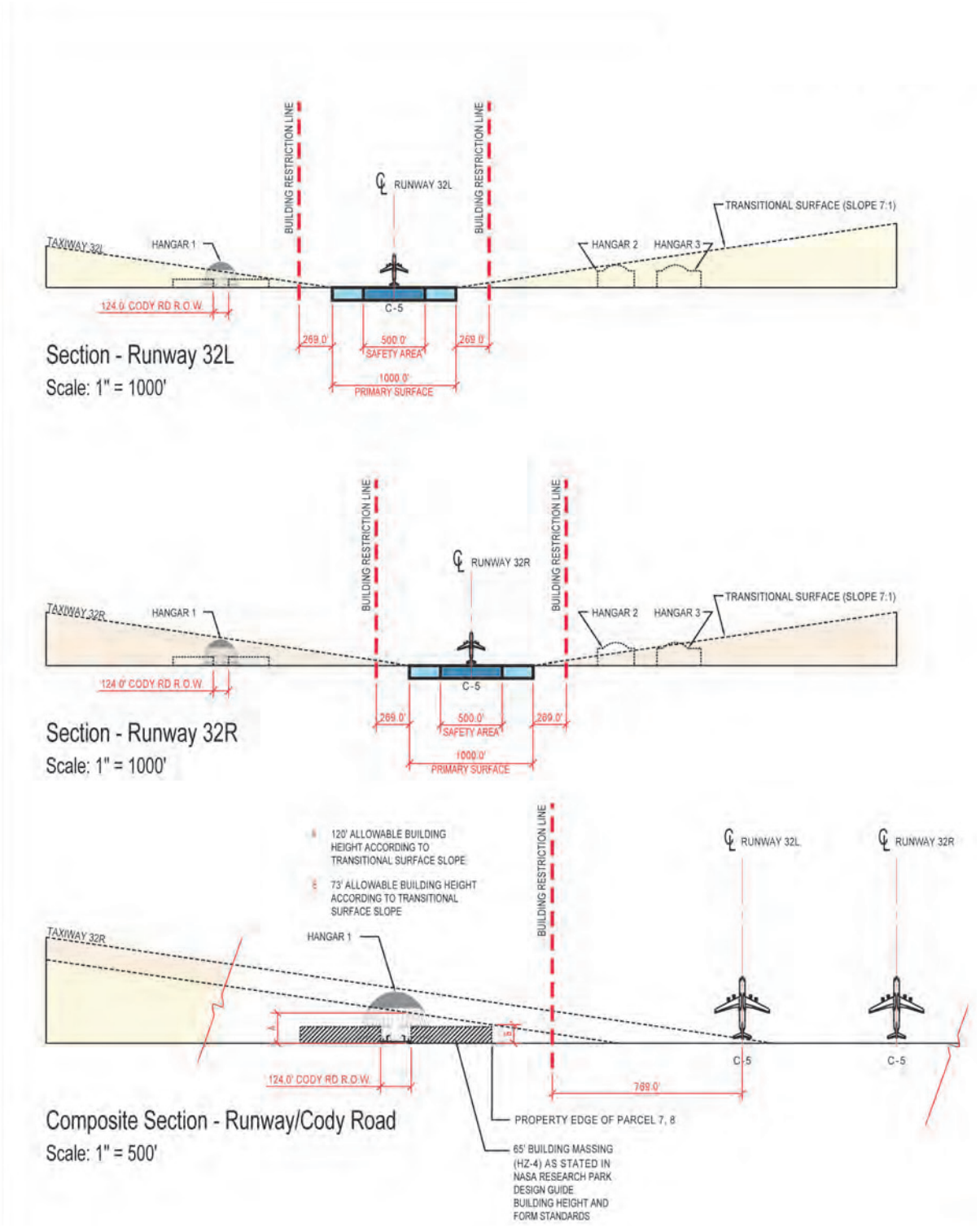


FIGURE 3.2-4

RUNWAY OBSTRUCTION SECTIONS

3.3 TRAFFIC AND CIRCULATION

A. Methodology

This section is based on a transportation analysis conducted by Fehr & Peers Associates in October 2001. The technical calculations are included in Appendix B, under separate cover.

The analysis of potential traffic and circulation impacts was conducted based on the standards and guidelines of the City of Mountain View, the City of Sunnyvale, and the Santa Clara Valley Transportation Authority (VTA), which is the congestion management agency for Santa Clara County. The transportation analysis addresses all travel modes including automobile, transit, bicycle, and pedestrian facilities and services. Intersection operations were analyzed using level of service (LOS) based on peak hour traffic volumes, lane configurations, and traffic control devices, while the remaining modes were assessed based on more qualitative measures. Descriptions of the existing transportation system serving each portion of the project site and the surrounding study area is presented below.

B. Regulatory Setting

The proposed project is expected to impact facilities maintained, monitored, or under the jurisdiction of the Santa Clara Valley Transportation Authority, the Cities of Mountain View and Sunnyvale, Santa Clara County, the California Department of Transportation (Caltrans), and NASA. The regulatory issues associated with each of these agencies is presented below.

1. Local Rules and Regulations

This section describes relevant regulations in Santa Clara County and the Cities of Mountain View and Sunnyvale.

a. Congestion Management Program (CMP)

The Santa Clara Valley Transportation Authority (VTA) is the congestion management agency (CMA) for Santa Clara County and implements the CMP. The CMP monitors operations of all freeways and selected expressways and

regional arterials through a biennial count program and determines the need for deficiency plans to reduce overall congestion. The Congestion Management Program (CMP) facilities in the study area include Highway 101, State Route (SR) 237, SR 85, and Central Expressway.

The VTA has also established uniform methods and guidelines for evaluating the transportation impacts of land use decisions on CMP facilities. All of the cities and towns within Santa Clara County have adopted the same transportation impact analysis methodology and significance criteria except for selected areas that are governed by special policies (e.g., North San Jose, the Evergreen area in San Jose). This common set of methods and guidelines allows each CMP member agency to understand the impacts of development in adjacent jurisdictions. By projecting against significant impacts to CMP facilities, the VTA can better anticipate the effect of land use changes and improve the planning process for the overall regional transportation system. Impacts to CMP facilities must be addressed as part of the environmental review process just as the policies of affected local jurisdictions must be used to determine impact significance.

b. City of Mountain View

The Circulation Chapter/Element of the City of Mountain View General Plan states specific goals, policies and actions designed to maintain acceptable traffic operations and to reduce congestion. Improved circulation is expected to be provided through enhancement of transit, bicycle, and pedestrian modes, as well as the use of aggressive Transportation Demand Management measures to reduce single-occupant vehicle trips. This document establishes the level of service standards for local roadways (LOS D), acknowledges higher levels of congestion on regional roadways (LOS E standard), and includes plans for future bicycle facilities and walkways. These standards were used to develop significance criteria presented in the subsequent impacts discussion section of this EIS.

The City of Mountain View and the VTA have expressed interest in pursuing a new vehicle connection between the Shoreline Boulevard area (also known

as North Bayshore) and Moffett Boulevard. The City has referenced this connection in two previously published documents. Policy 24 under Goal J of the General Plan is "Reinforce NASA/Ames as an important institutional citizen of Mountain View." Action 24.d under this policy calls for "creation of a link between the North Bayshore area and the entrance to NASA/Ames." Although an existing pedestrian/bicycle connection is currently provided via a bridge at the east end of Charleston Road, the new link is intended to be a full vehicular connection.

A new link between the North Bayshore area and Moffett Boulevard is also referenced in the North Bayshore Area Precise Plan Environmental Impact Report. The analysis cited in this document indicated that the projected reductions in Shoreline Boulevard traffic with a Charleston Road bridge and a Crittendon Lane bridge would more than offset any increases caused by traffic originating from NASA. Provision of even one bridge was expected to divert more than 50 percent of the total diverted traffic with both extensions. However, this analysis did not assume redevelopment of the Ames Research Center site with the land uses proposed under any of the project build alternatives.

According to City of Mountain View staff, VTA and Caltrans have also expressed interest in a new link on the east side of Highway 101 to allow for a redistribution of local traffic between the Shoreline Boulevard and Moffett Boulevard interchanges, as well as to reduce the possibility of local trips using the freeway.

c. City of Sunnyvale

Circulation issues for the City of Sunnyvale are listed in the Land Use and Transportation Element of the General Plan. The goals, policies and action statements in this document delineate the operating standard for City streets (LOS D) and regional roadways (LOS E). Specific action items call for participating in coordinated regional land use and transportation planning, supporting alternative modes of transportation, optimizing the use of existing transportation facilities to minimize roadway widenings, and integrating

complementary land uses to reduce overall travel and enhance the community environment.

d. County of Santa Clara

The County of Santa Clara maintains roadways in unincorporated areas and expressway facilities. The only County maintained roadways included in this study are Central Expressway and Manila Drive. The County strives to maintain an LOS D standard for roadway operations, and also follows the CMP criteria for regional facilities. The addition of a high occupancy vehicle lane on the Central Expressway has been identified in the Valley Transportation Plan (VTP) 2020 published by VTA in December 2000.

2. State Regulations and Policies

Caltrans has jurisdiction over all state routes including interstate freeways (Interstate 280), US Highways (Highway 101), and state highways (State Routes 85 and 237). Caltrans strives to maintain LOS C operations on all of its facilities but acknowledges that numerous roadway segments under its control in urban areas will operate at LOS D or worse. Any modifications to facilities within the Caltrans right-of-way must be approved by the State. Although impacts to freeway segments are identified as part of the transportation impact analysis process established by the VTA, Caltrans can request additional information to determine anticipated impacts to State facilities. Caltrans maintains an environmental review section to address new developments in local jurisdictions.

3. Federal Regulations and Policies

Roadways within Ames Research Center are under the governance of NASA. Previous publications by the Federal Highway Administration and the Federal Transit Authority indicated that operations of all transportation facilities are typically designed and maintained based on standard engineering practice and may adhere to local standards. However, the federal government does not employ its own specific standards for intersection operation or other modes that would be used to identify significant environmental impacts. For this

study, criteria for the local, county, and State jurisdictions was used to maintain consistency with current planning efforts.

C. Existing Transportation System

This section describes the existing transportation characteristics of Ames Research Center and the surrounding area. The transportation system includes the freeways, streets, bus and rail transit facilities and services, and bicycle and pedestrian routes that form both the regional and internal networks at Ames Research Center. The proposed development alternatives would have varying impacts on the transportation facilities and their operations, as analyzed in Section 4.3.

Highway 101 is a major north-south route through the San Francisco Bay Area, although it is located on an east-west alignment in the proximity of Ames Research Center. For purposes of this analysis, Highway 101 is referenced as a north-south facility, while arterial roadways such as Moffett Boulevard and Ellis Street are referenced as east-west facilities regardless of their alignment. The other major freeways within the study area are Highway 85 and Highway 237. Highway 85 is a north-south facility that intersects Highway 101 just west of Ames Research Center, while Highway 237 is an east-west facility that intersects with Highway 101 near the southeast corner of Ames Research Center property.

The primary access points to Ames Research Center are provided along Highway 101 at the Moffett Boulevard and Ellis Street interchanges. The main gate to Ames Research Center is located on Moffett Boulevard, which provides direct connections to both Highway 101 and Highway 85. A second primary gate is located on Ellis Street, which provides a direct connection to Highway 101. The Ellis Street gate may also be accessed from Highway 237 via the Mathilda Avenue interchange and Manila Drive/Moffett Park Drive. Secondary gates are located to the west of Moffett Boulevard (Gate 17) and along the eastern boundary on 5th Avenue west of H Street. (near Lockheed-

Martin). More detailed descriptions of the various transportation facilities are presented below.

1. Roadways

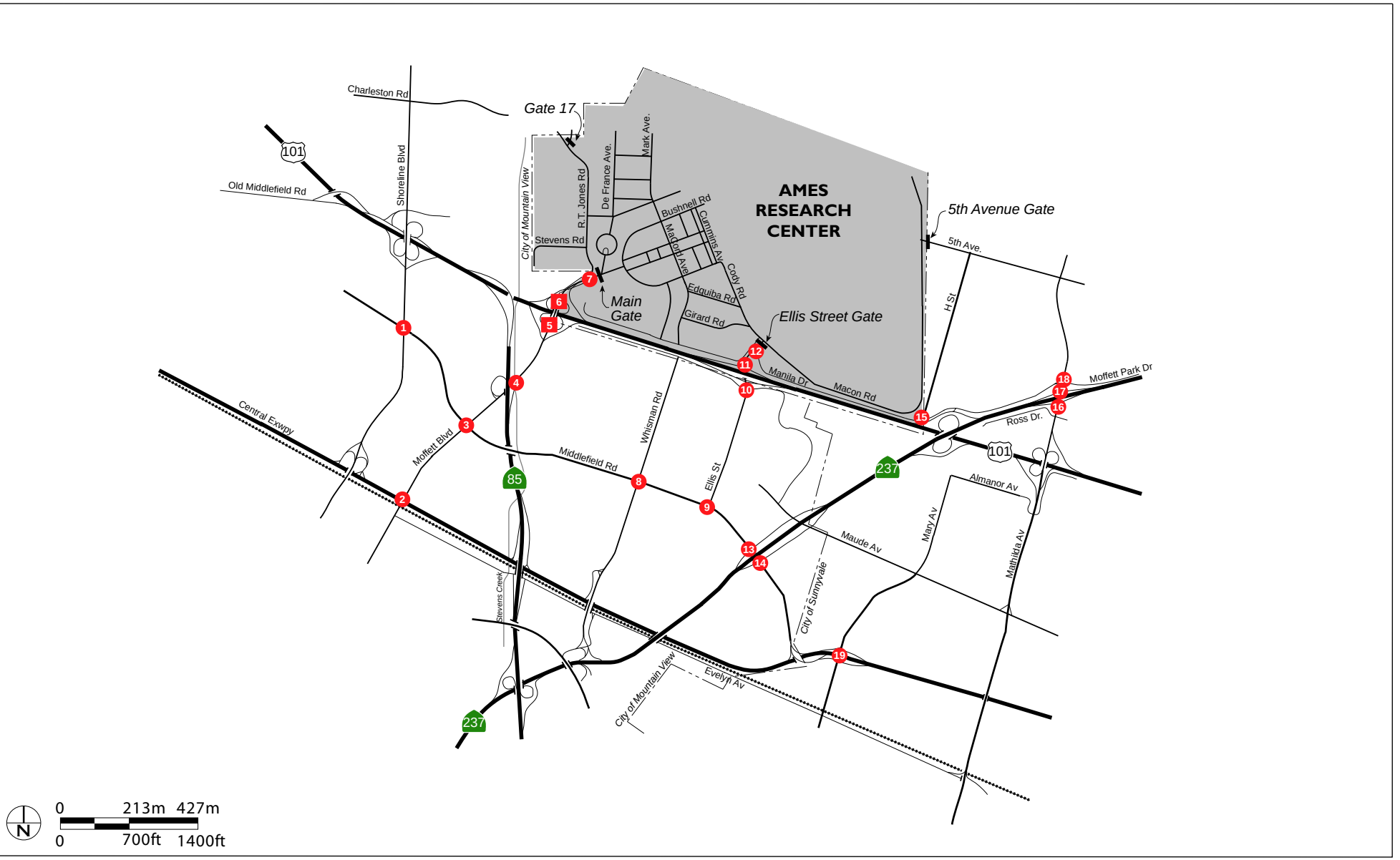
This section describes roadways and intersection condition within the traffic study area.

a. Regional Roadway Network

The major regional roadways that are most significant for Ames Research Center are summarized below and illustrated on Figure 3.3-1.

Highway 101: A major north-south route through California extending from Los Angeles to the Oregon state line. North of the project site, Highway 101 provides connections to cities throughout San Mateo County and San Francisco. To the south, it provides connections to Santa Clara, San Jose, and Central Coast communities. Within the study area, Highway 101 is a freeway with four lanes in each direction, with the median lanes designated as high occupancy vehicle (HOV) lanes during the morning (5:00 a.m. to 9:00 a.m.) and evening (3:00 p.m. to 7:00 p.m.) commute periods on weekdays.

State Route (SR) 85: A circumferential, north-south freeway that originates at Highway 101 near Ames Research Center and extends south and east, reconnecting to Highway 101 in south San Jose near Bernal Road. From Ames Research Center, Highway 85 provides connections to Sunnyvale, Cupertino, Saratoga, Los Gatos, Campbell and southern San Jose. For most of its length and within the study area, Highway 85 is a six-lane facility with median lanes designated as HOV lanes during the peak commute periods. Ramps to and from the south on Highway 85 are provided on Moffett Boulevard southeast of Highway 101. The complex existing Highway 85 interchange at Highway 101 near Ames Research Center causes substantial peak period congestion because of outdated interchange designs, numerous vehicular weaving movements, and the close proximity of the Shoreline Boulevard and Moffett Boulevard interchanges on Highway 101. VTA plans to upgrade this interchange.



Source: Fehr & Peers Associates, Inc.

4 Study Intersections
5 Future Study Intersections (Moffett/ Highway 101 Ramps)

FIGURE 3.3-1

STUDY INTERSECTIONS

State Route (SR) 237: An east-west facility located to the southeast of Ames Research Center, extending between Highway 85 and Highway 680. This facility serves regional traffic between Milpitas and southern Alameda County, and the large employment base in northern Santa Clara, Sunnyvale and Mountain View. On the segment between Highway 101 and Highway 880, Highway 237 is primarily a six-lane freeway, with the median lanes designated as HOV lanes during the peak weekday commute periods. Access from Ames Research Center to Highway 237 is typically provided via Highway 101 from either the Ellis Street or Moffett Boulevard interchanges, although direct access is provided via Manila Drive/Moffett Park Drive and the Highway 237/Mathilda Avenue interchange.

Moffett Boulevard: A four-lane arterial street that extends between Central Expressway near downtown Mountain View and the primary gate access into Ames Research Center. South of Central Expressway, Moffett Boulevard is designated as Castro Street. At the main gate, Moffett Boulevard becomes Clark Memorial Drive, and R. T. Jones Road (the Moffett Boulevard Extension) extends north/west of the main gate. Regional access to Ames Research Center from Moffett Boulevard is provided via interchanges with both Highway 101 and Highway 85 (to and from the south only).

Ellis Street: A four-lane arterial extending between Ames Research Center east of Highway 101 and Middlefield Road in Mountain View. A full-access interchange is provided at Highway 101 through which the existing VTA Light Rail Line operates. A 24-hour security gate is located at the eastern terminus of Ellis Street between Manila Drive and Macon Road (the existing airfield roadway parallel to Highway 101).

Manila Drive/Moffett Park Drive: A two-lane, public access roadway extending between Ellis Street and Mathilda Avenue along the edge of Ames Research Center that is generally parallel to Highway 101 and the VTA Light Rail Line. It provides access to the new LRT station and a connection between Ames Research Center and Mathilda Avenue. West of H Street, this street is

designated as Manila Drive; between H Street and Mathilda Avenue, it is known as Moffett Park Drive.

H Street: A two-lane roadway extending between Manila Drive and 3rd Avenue east of the airfield. This street crosses the VTA Light Rail Line.

5th Avenue: A two-lane roadway linking Macon Road within the airfield to Borregas Drive east of Mathilda Avenue. A security gate is located at the west end of the street. This street also crosses the VTA Light Rail Line at Mathilda Avenue.

Mathilda Avenue: A multi-lane arterial located southeast of Ames Research Center that extends between Caribbean Drive and Sunnyvale Avenue in the City of Sunnyvale. Mathilda Avenue includes full-access interchanges at both Highway 101 and Highway 237, and is a major corridor serving the extensive employment base in the Moffett Park area south and east of Ames Research Center. The closely-spaced intersections of Moffett Park Drive, the Highway 237 ramps, and Ross Drive result in substantial congestion during peak periods due to complex signal phasing and very short vehicle storage lengths. The secondary access gate serving Ames Research Center (the Eastside/Airfield area) can be accessed from Mathilda Avenue via 5th Avenue.

Middlefield Road: A two- to four-lane arterial roadway that extends from Winslow Avenue in Redwood City to the Central Expressway interchange in the City of Sunnyvale. Middlefield Road is roughly parallel to Highway 101, and includes at-grade intersections at Moffett Boulevard and Ellis Street. Through the study area, Middlefield Road has two lanes in each direction.

Central Expressway: A four-lane limited access facility extending from southeast of Charleston Road in the City of Palo Alto to De La Cruz Boulevard in the City of Santa Clara. This facility provides a local alternate to Highway 101, and includes an at-grade intersection at Moffett Boulevard, as well as grade-separated interchanges at Highway 85 (to and from the north only) and Middlefield Road.

The study intersections and freeway segments analyzed for this project are illustrated on Figure 3.3-1.

b. Site Access

Access into Ames Research Center is currently limited to a number of entry gate locations. The hours of operation for these gates vary by location. The gate locations are illustrated in Figure 3.3-1, which also shows some of the internal roadway network.

- **Main Gate.** Main Gate is located on Moffett Boulevard/Clark Memorial, east of the Highway 101 freeway interchange. It is open 24 hours a day, 7 days per week.
- **Ellis Street Gate.** Ellis Street Gate is located east of Highway 101 on Ellis Street. It is open 6 a.m. to 6 p.m., Monday through Friday.
- **Gate 17.** Gate 17 is located off of R.T. Jones Road, west of the Main Gate. It is open 6 a.m. to 6 p.m., Monday through Friday.
- **East Gate.** The East Gate (also referred to as the Lockheed-Martin Gate), is located at 5th Avenue along the eastern boundary of Ames Research Center. It is open 5:00 a.m. to 5:00 p.m., Monday through Friday.

Once inside the Ames Research Center, additional security gates are in place to control access to the Ames Campus and Eastside/Airfield.

c. Internal Roadway Network

The internal roadway system of interest includes the roadway network within the NRP, Ames Campus, Bay View, and Eastside/Airfield areas (see Figures 1-4 through 1-7). For purposes of this analysis, the NRP is assumed to be bounded by Highway 101, Moffett Boulevard/Clark Memorial Drive/Bushnell Road, and Cody Road/Macon Road. The Ames Campus area is located north of Clark Memorial Drive and Bushnell Road, and east of R.T. Jones Road.

As part of the data collection program for this study, an inventory of existing traffic control devices on selected roadway segments within Ames Research

Center was conducted in 1999 and 2000. The inventory included traffic signs and pavement and curb markings. Other traffic features, such as barriers and traffic signals, were observed within the context of the inventory. In concert with the inventory process, traffic control devices were evaluated for compliance with currently accepted standards for content and placement. Specifically, the most recent editions of the *Caltrans Traffic Manual, Caltrans Sign Specifications, and the Federal Highway Administration (USDOT) Manual of Uniform Traffic Control Devices (MUTCD)* were consulted. These state and federal guidelines are generally consistent.

As a federal facility, Ames Research Center has not been subject to typical civilian standards in the design and application of traffic control devices. Numerous substandard applications of traffic control devices and signage were observed. In some instances, substandard applications can lead to safety and traffic problems. Accident records maintained by NASA suggest no major existing traffic safety problems within Ames Research Center, due in part to the current low traffic volumes. However, there are several locations where turning radii and other operational features could be improved (e.g., right-of-way at the intersection of Clark Memorial Drive, Bushnell Road, North Akron Road, South Akron Road, and Westcoat Road can be confusing for first time visitors) (see Figures 1-4 through 1-7).

i. NRP and Ames Campus Areas

The existing internal road system within the NRP area was designed incrementally by the Navy as the base developed since its creation in 1930, and in the Ames Campus area by NASA since 1940. The Navy and NASA, unlike the civilian sector, were not restricted by property lines, easements, or design and aesthetic standards. In addition, the travel patterns associated with past Navy operations at the site are not necessarily the same as those that might be produced by the proposed development. This has resulted in a roadway system that may, in some instances, not be compatible with the proposed project land uses.

Most internal roadways have two lanes (one in each direction), with several four lane roads. Although the roadways and parking facilities in the NRP area were initially designed to serve the Navy's unique needs, the vehicle network is fairly structured. In the Shenandoah Historic District bounded by Bushnell Road, Westcoat Road, and Cummins Avenue, roads are laid out in a grid pattern, and often have curbs and sidewalks. In other parts of the NRP and Ames Campus areas, the roads form a less structured pattern, and many lack finished curbs and sidewalks.

ii. Bay View

The street system near the Bay View area is limited. Direct access to the Bay View area is provided by Parsons Avenue, DeFrance Avenue, Lindbergh Avenue, and Victory Road. These facilities are generally two-lane roadways serving low traffic volumes. In some cases, these roads do not have sidewalks or finished curbs and gutters. The only external access point near the Bay View area is a pedestrian/bicycle bridge over Stevens Creek to the west that connects to Charleston Road.

iii. Eastside/Airfield

The primary roadway in the Eastside/Airfield area is Macon Road, which provides access to Hangars 2 and 3, as well as the golf course. East Patrol Road crosses Macon Road and provides local access to the remaining uses in this area. Direct external access to adjacent public areas is provided by the East Gate on 5th Avenue.

d. Intersection Analysis Methodology

The methodologies used for this EIS follow the standards and guidelines of the Cities of Mountain View and Sunnyvale. They also follow the methodologies described in *Transportation Impact Analysis Guidelines* and *Traffic Level of Service Analysis Guidelines* produced by the Valley Transportation Authority (VTA). The VTA administers the County's Congestion Management Program (CMP) and monitors the impact of land use decisions by the member jurisdictions. The methodology for evaluating intersection performance is described below.

The operation of roadways is governed by the function of intersections, which represent the constraint points of the roadway network. The operating conditions of the key intersections were evaluated with level of service (LOS) calculations. Level of service is a qualitative description of an intersection's operation ranging from LOS A, or free-flow conditions, to LOS F, or congested conditions.

The intersection level of service methodology used in this analysis to evaluate signalized intersections is the approved VTA methodology, which has been adopted by the Cities of Mountain View and Sunnyvale. This method evaluates an intersection's operation based on the average stopped vehicular delay calculated using the procedure described in Chapter 9 of the 1985 *Highway Capacity Manual* (HCM), with saturation flow rates adjusted to reflect local (Santa Clara County) conditions per VTA guidelines. The average delay for signalized intersections is calculated using the TRAFFIX analysis software, and is correlated to a level of service designation as shown in Table 3.3-1. The "+" and "-" symbols are a more detailed description of delay ranges within each service level, and are not referenced in the text to simplify the discussion (e.g., LOS E+ is referred to as LOS E in the text). A "+" indicates that the intersection is on the better end of the range for a particular LOS, with shorter delays, while a "-" indicates that the intersection is on the worse end of the range for a particular LOS.

Operations of unsignalized intersections were calculated using the procedures outlined in Chapter 10 of the 1997 Update to the HCM. The LOS rating is based on the average control delay for each minor street movement measured in seconds per vehicle. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For all-way stop control intersections, level of service is defined for the intersection as a whole based on a weighted average control delay. Only the worst-case delay is used to identify LOS for two-way stop controlled intersections (i.e. stop signs on the minor street approaches). The previous 1994 HCM methodology measured "total" delay, which includes queue move-up time and stopped delay. Consequently, the delay ranges have been adjusted upward from the 1994

HCM delay ranges to account for initial deceleration delay and final acceleration delay. Table 3.3-2 presents the range of control delay that corresponds to each LOS designation.

Roadway system deficiencies and impacts are defined as occurring where the calculated LOS falls below the acceptable level of performance. The VTA has established LOS E as the standard for CMP facilities. CMP-designated intersections include Central Expressway/Moffett Boulevard-Castro Street and Central Expressway/Mary Avenue. In general, both Mountain View and Sunnyvale consider LOS D to be the minimum acceptable level of peak hour operation for signalized intersections on non-CMP routes. In addition, the City of Sunnyvale strives to maintain any existing acceptable LOS (i.e., A, B, and C) at intersections where feasible. Neither VTA nor the cities have established a minimum LOS standard for stop-sign controlled intersections. However, typical practice in these jurisdictions has been to accept LOS E operation for a particular movement or shared approach, but to investigate the possibility of signalization in cases where LOS F operations occur or are projected. Caltrans warrant criteria in the *Traffic Manual* are used to help identify the need for signalization, especially in cases where vehicles on the minor street approaches are expected to experience extensive delay.

e. Existing Intersection Volumes and Level of Service

Peak-period turning movement counts were conducted during October and November 1999 for all but six of the study intersections. New counts were conducted at the following locations in July 2000:

- Middlefield Road/Shoreline Boulevard
- Middlefield Road/Whisman Road
- Middlefield Road/Ellis Road
- Middlefield Road/Highway 237 eastbound Ramps
- Central Expressway/Moffett Boulevard (AM peak hour only)

TABLE 3.3-1 **SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS**

Level of Service	Average Delay Per Vehicle (Seconds)	Description
A	# 5.0	Operations with very low delay occurring with favorable progression and/or short cycle length.
B+ B B-	5.1 to 7.0 7.1 to 13.0 13.1 to 15.0	Operations with low delay occurring with good progression and/or short cycle lengths.
C+ C C-	15.1 to 17.0 17.1 to 23.0 23.1 to 25.0	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.
D+ D D-	25.1 to 28.0 28.1 to 37.0 37.1 to 40.0	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.
E+ E E-	40.1 to 44.0 44.1 to 56.0 56.1 to 60.0	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.
F	> 60.0	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.

Source: VTA, *CMP Transportation Impact Analysis Guidelines*, May 7, 1998, and Transportation Research Board, *Highway Capacity Manual*, Special Report 209, 1985.

TABLE 3.3-2 **LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS**

Level of Service	Average Control Delay per Vehicle (Seconds)
A	# 10
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	> 50

Source: Transportation Research Board, *Highway Capacity Manual*, Special Report 209, 1994 (adjusted for the 1997 update to Chapter 10).

At the Central Expressway/Mary Avenue intersection, peak hour count data were obtained from the VTA's 2000 CMP Monitoring and Conformance data files.

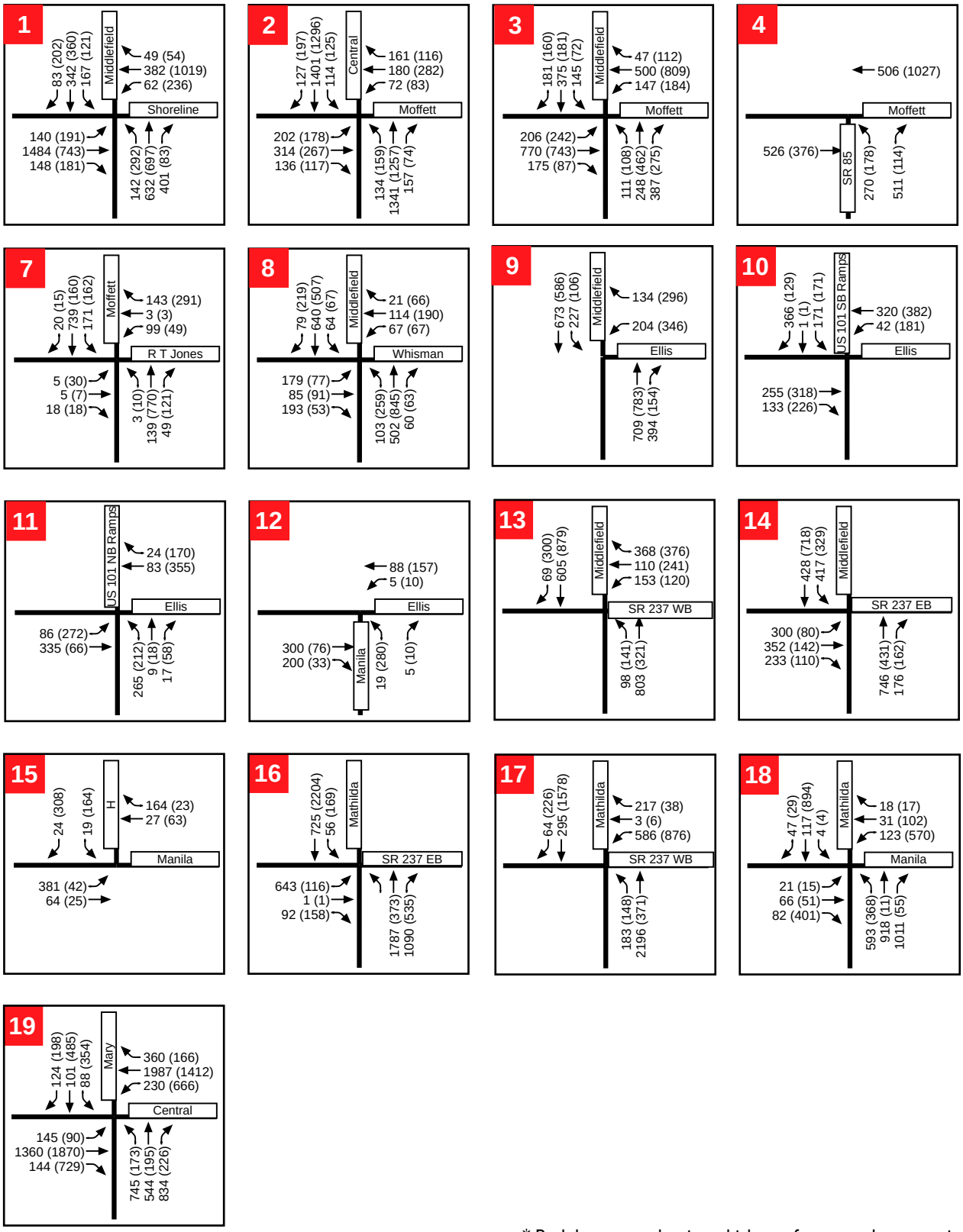
All counts were conducted during the morning (7:00 a.m. to 9:00 a.m.) and evening (4:00 p.m. to 6:00 p.m.) peak periods. The one-hour timeframe where the highest volumes are counted during each period is referred to as the peak hour (e.g., 7:30 a.m to 8:30 a.m.). Existing AM and PM peak hour traffic volumes are shown in Figure 3.3-2 for all of the study intersections. The existing lane configurations at each intersection are illustrated on Figure 3.3-3.

The existing volumes were used with the lane configurations to evaluate the current operations of the key intersections. The results of the intersection analysis are presented in Table 3.3-3, and the corresponding level of service calculation sheets are contained in Appendix B.

TABLE 3.3-3 **EXISTING SIGNALIZED INTERSECTION LEVEL OF SERVICE**

	Intersection	Peak Hour	Count Date	Delay	LOS
1.	Middlefield Rd/ Shoreline Blvd	AM PM	July 2000 July 2000	37.0 41.5	D E+
2.	Moffett Blvd-Castro St/ Central Expressway	AM PM	July 2000 April 2000	31.4 32.5	D D
3.	Moffett Blvd. Middlefield Rd.	AM PM	November 1999 November 1999	27.0 25.5	D+ D+
4.	Moffett Blvd./Hwy 85 NB Off-Ramp	AM PM	November 1999 November 1999	9.8 5.5	B B+
7.	Moffett Blvd-Clark Memorial Dr./R.T. Jones Rd. (unsignalized)	AM PM	November 1999 November 1999	14.4 22.8	B C
8.	Middlefield Rd./Whisman Rd.	AM PM	July 2000 July 2000	12.5 12.6	B B
9.	Ellis St./Middlefield Rd.	AM PM	July 2000 July 2000	11.3 12.3	B B
10.	Ellis St./Hwy 101 SB Ramps(unsignalized)	AM PM	November 1999 November 1999	17.4 16.0	C C+
11.	Ellis St./Hwy 101 NB Ramps	AM PM	November 1999 November 1999	9.1 8.0	B B
12.	Ellis St./Manilla Dr. (unsignalized)	AM PM	November 1999 November 1999	8.1 9.6	A A
13.	Middlefield Rd./Hwy 237 WB Ramps	AM PM	November 1999 November 1999	15.0 14.8	B- B-
14.	Middlefield Rd./Hwy 237 EB Ramps	AM PM	July 2000 July 2000	16.8 12.5	C+ B
15.	Manila St./H St.	AM PM	November 1999 November 1999	7.7 7.5	B B
16.	Mathilda Ave./Hwy 237 EB Ramps	AM PM	November 1999 November 1999	14.3 10.9	B- B
17.	Mathilda Ave./Hwy 237 WB Ramps	AM PM	November 1999 November 1999	15.8 20.5	C+ C
18.	Mathilda Ave./Moffett Park Dr.	AM PM	November 1999 November 1999	14.8 27.6	B- D+
19.	Central Expy./Mary Ave.	AM PM	October 1999 April 2000	50.2 41.8	E- E+

Notes:
1. Whole intersection weighted ave. stopped delay expressed in seconds/vehicle for signalized intersections, and total control delay in seconds/vehicle for unsignalized intersections.
2. LOS calculations for signalized intersections performed using the 1985 Highway Capacity Manual methodology contained in the TRAFFIX software package with adjusted saturation flow rates to reflect local conditions.
3. LOS calculations for unsignalized intersections performed using the 1997 Highway Capacity Manual methodology contained in the TRAFFIX software package.
4. Intersections 4 and 5 (Moffett Boulevard/Highway 101 NB Ramps and Moffett Boulevard/ Highway 101 SB Ramps) are future intersections to be constructed.



not to scale

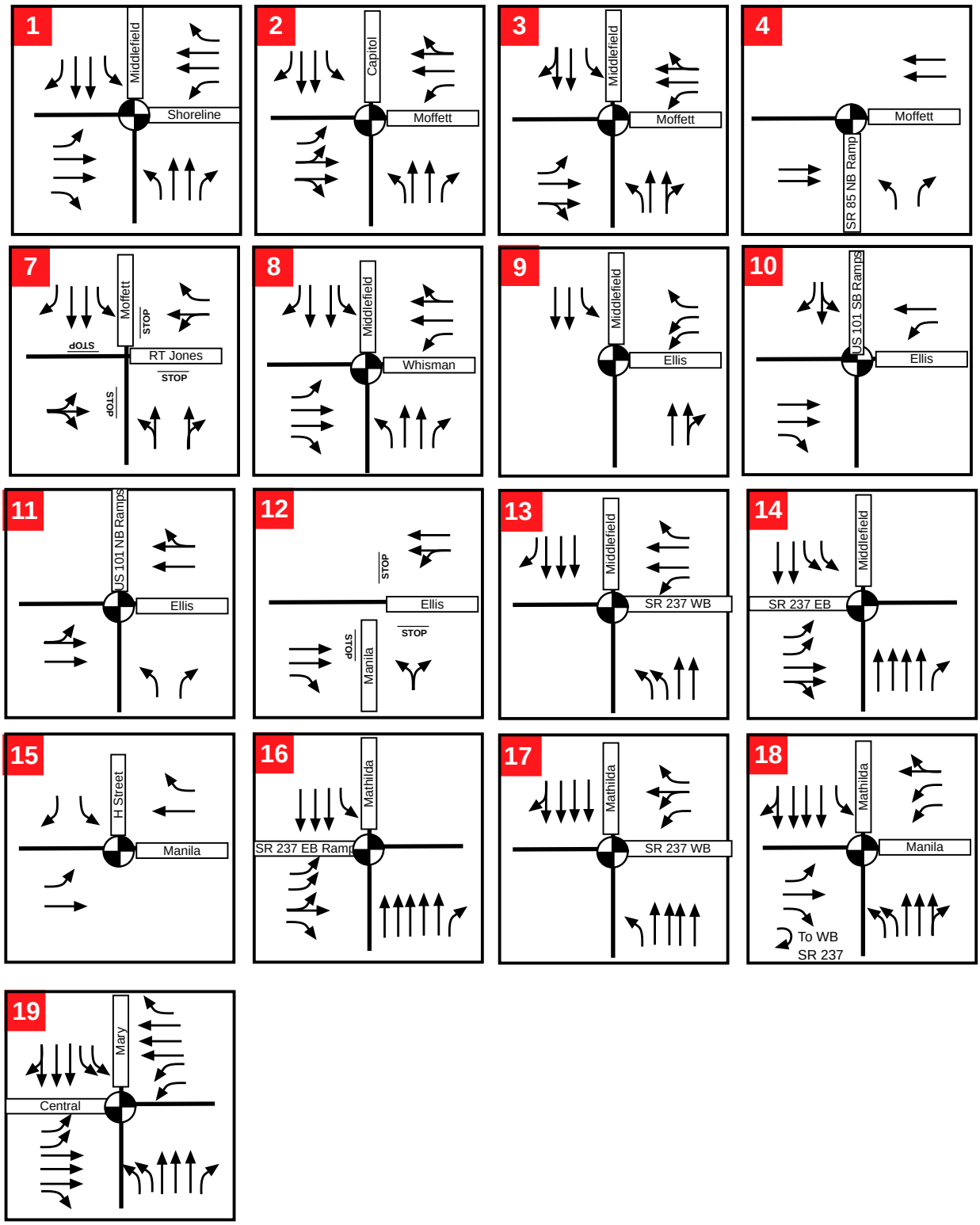
* Peak hours are the times highest of measured consecutive one-hour volumes between 7:00-9:00 am and 4:00-6:00 pm.

Source: Fehr & Peers Associates, Inc.

XX (YY) = AM (PM) Peak Hour* Traffic Volumes

FIGURE 3.3-2

EXISTING AM/PM PEAK HOUR TRAFFIC VOLUMES



not to scale

Source: Fehr & Peers Associates, Inc.

Traffic Signal

FIGURE 3.3-3

EXISTING LANE CONFIGURATIONS

As shown in Table 3.3-3, only one of the external study intersections currently operates at a deficient level according to the technical calculations: The Middlefield Road/Shoreline Boulevard intersection operates at LOS E during the PM peak hour, while all other intersections operate at acceptable levels during both peak hours. It should be noted however, that several locations are considered to operate at worse levels of service based on field observations. At the Moffett Boulevard-Castro Street/Central Expressway intersection, normal traffic signal cycle operations are periodically disrupted by crossing gates closing the south leg of the intersection to accommodate Caltrain passenger rail operations. This activity increases delay for some movements and worsens overall LOS. It can take several cycles or more for operations to return to normal until the next train requires lowering of the crossing arms.

The relatively good levels of service calculated for the Mathilda Avenue/Moffett Park Drive intersection (LOS D or better) do not correspond with field observations that show some lengthy delays caused by downstream vehicle queuing and the close proximity of four traffic signals near the vicinity of the Mathilda Avenue/Highway 237 interchange. Additional through capacity is required under existing conditions to minimize queuing and provide acceptable operations during both peak periods. Operations at this location with the addition of traffic from cumulative projects are discussed in the section on Future Cumulative Conditions.

Lastly, the stop-sign controlled intersection at Moffett Boulevard-Clark Memorial Drive and Moffett Boulevard Extension, which is essentially internal to Ames Research Center, does experience some back-ups during both peak periods. However, these delays are caused by security checks of vehicles and are typically temporary and not excessive. Several vehicles may queue at the security gate, but overall operations are not compromised.

f. Existing Freeway Analysis Methodology and Operations

Per the VTA guidelines, the method for evaluating freeway operations is based on density expressed as passenger cars per mile per lane. The LOS criteria for freeway operations, shown in Table 3.3-4, are based on the criteria from the

TABLE 3.3-4 **DENSITY-BASED FREEWAY LEVEL OF SERVICE CRITERIA**

Level of Service	Density (vehicles per mile per lane)
A	10
B	10.0 < density # 16.0
C	16.0 < density # 24.0
D	24.0 < density # 46.0
E	46.0 < density # 55.0
F	> 55.0

Source: Transportation Impact Analysis Guidelines (VTA Congestion Management Program Guidelines, May 7, 1998).

1994 HCM, with some modifications based on an evaluation of field data conducted by VTA. Similar to intersections, freeway segments were analyzed for both the AM and PM peak hours.[1] All of the U. S. Highway 101, SR 237, and SR 85 freeway segments in the immediate vicinity of the project site were analyzed, in accordance with requirements described in the VTA's *Transportation Impact Analysis Guidelines.*

Freeway segment volumes and LOS were taken directly from the VTA's *2000 Monitoring and Conformance Report.* The AM and PM peak hour LOS for the selected freeway segments are shown in Table 3.3-5.

Several of the freeway segments in the vicinity of Ames Research Center operate at LOS F during one or both peak periods. These results illustrate the high level of existing congestion on the area's freeway system, particularly

[1] Peak hour analyzed varies by freeway segment. This analysis uses the highest one-hour totals between 6:30 am and 9:30 am and between 3:30 pm and 6:30 pm for each segment.

Table 3.3-5
Existing Freeway Operations (Near Site)

Freeway	Segment	Direction	Peak Hour	Existing[1] Lanes	Volume	Average Speed	Density	LOS[2]
US 101	North of Lawrence	NB	AM	3	4,675	60	27	D
US 101	North of Lawrence	NB	PM	3	5,675	60	33	D
US 101	Moffett to SR 85	NB	AM	3	3,960	15	88	F
US 101	Moffett to SR 85	NB	PM	3	4,550	15	101	F
US 101	Moffett to SR 85	SB	AM	3	6,900	50	46	D
US 101	Moffett to SR 85	SB	PM	3	5,940	55	36	D
US 101	Moffett to SR 85	NB HOV	AM	1	1,340	15	89	F
US 101	Moffett to SR 85	NB HOV	PM	1	1,960	40	49	E
US 101	Moffett to SR 85	SB HOV	AM	1	1,800	60	30	D
US 101	Moffett to SR 85	SB HOV	PM	1	1,440	60	24	C
US 101	SR 237 to Moffett	NB	AM	3	3,960	15	88	F
US 101	SR 237 to Moffett	NB	PM	3	4,500	25	60	F
US 101	SR 237 to Moffett	SB	AM	3	4,950	25	66	F
US 101	SR 237 to Moffett	SB	PM	3	5,940	55	36	D
US 101	SR 237 to Moffett	NB HOV	AM	1	1,440	20	72	F
US 101	SR 237 to Moffett	NB HOV	PM	1	1,380	60	23	C
US 101	SR 237 to Moffett	SB HOV	AM	1	1,620	60	27	D
US 101	SR 237 to Moffett	SB HOV	PM	1	1,260	60	21	C
US 101	Mathilda to SR 237	NB	AM	3	4,740	20	79	F
US 101	Mathilda to SR 237	NB	PM	3	5,040	60	28	D
US 101	Mathilda to SR 237	SB	AM	3	6,450	50	43	D
US 101	Mathilda to SR 237	SB	PM	3	5,220	60	29	D
US 101	Mathilda to SR 237	NB HOV	AM	1	1,790	35	51	E
US 101	Mathilda to SR 237	NB HOV	PM	1	1,200	60	20	C
US 101	Mathilda to SR 237	SB HOV	AM	1	1,680	60	28	D
US 101	Mathilda to SR 237	SB HOV	PM	1	1,320	60	22	C
SR 85	Central Expwy to US 10	NB	AM	2	3,160	20	79	F
SR 85	Central Expwy to US 10	NB	PM	2	2,080	65	16	B
SR 85	Central Expwy to US 10	SB	AM	2	1,560	65	12	B
SR 85	Central Expwy to US 10	SB	PM	2	3,450	25	69	F
SR 85	Central Expwy to US 10	NB HOV	AM	1	980	65	15	B
SR 85	Central Expwy to US 10	NB HOV	PM	1	520	65	8	A
SR 85	Central Expwy to US 10	SB HOV	AM	1	780	65	12	B
SR 85	Central Expwy to US 10	SB HOV	PM	1	780	65	12	B
SR 237	Maude to US 101	WB	AM	2	3,120	60	26	D
SR 237	Maude to US 101	WB	PM	2	4,290	55	39	D
SR 237	Maude to US 101	EB	AM	2	3,250	25	65	F
SR 237	Maude to US 101	EB	PM	2	1,690	65	13	B
SR 237	US 101 to Mathilda	WB	AM	2	3,720	60	31	D
SR 237	US 101 to Mathilda	WB	PM	2	4,180	55	38	D
SR 237	US 101 to Mathilda	EB	AM	2	2,610	15	87	F
SR 237	US 101 to Mathilda	EB	PM	2	2,760	60	23	C
SR 237	Mathilda to N. Fair Oak	WB	AM	2	3,590	60	26	D
SR 237	Mathilda to N. Fair Oak	WB	PM	2	4,430	55	35	D
SR 237	Mathilda to N. Fair Oak	EB	AM	2	3,400	25	68	F
SR 237	Mathilda to N. Fair Oak	EB	PM	2	2,400	60	20	C
SR 237	Mathilda to N. Fair Oak	EB HOV	AM	1	1,620	60	27	D
SR 237	Mathilda to N. Fair Oak	EB HOV	PM	1	650	65	10	A

Notes:

[1] Lanes, volume and density from VTA 2000 CMP Monitoring Data

[2] LOS based on speed presented in CMP monitoring report

northbound on Highway 101. As noted previously, the complicated existing Highway 85 interchange at Highway 101 near Ames Research Center causes substantial peak period congestion because of outdated interchange designs, numerous vehicular weaving movements, and the close proximity of the Shoreline Boulevard and Moffett Boulevard interchanges on Highway 101. This interchange will be reconstructed as part of a planned regional improvement project.

Given the number of new employment opportunities generated by the proposed project, employees are expected to travel from outside the immediate south Bay Area to work at Ames Research Center. This travel could potentially affect freeway operations on the Peninsula (San Mateo County), in the East Bay and Central Valley (Alameda, Contra Costa, San Joaquin counties), and to the south (Santa Clara, Santa Cruz, and San Benito counties). To estimate the locations of potential freeway impacts and identify external study locations, project-generated commuter trips were distributed based on the projected residences of commuters to the Sunnyvale/Mountain View Superdistrict published by the Metropolitan Transportation Commission (MTC). (Trip distribution is described in more detail in the impacts discussion section.) Trips made by university students, on-site residents, and museum visitors were assumed to be more local (i.e. mostly within Santa Clara County), or would be made outside typical commute periods. Therefore, not all project-generated trips would be assigned to the furthest freeway segments.

Using a criterion of a one per cent or more increase in capacity, those freeway segments selected for analysis that are not immediately adjacent to the project site are presented in Table 3.3-6. Study segments were selected based on available traffic data and their location between freeway or major arterial interchanges. Existing data for these facilities was obtained from the VTA *2000 Monitoring and Conformance Report*, the Alameda County Congestion Management Program's *2000 Level of Service Monitoring Study*, and the San Mateo County Congestion Management Program's *1999 Monitoring Report.* It should be noted that the Alameda County data presents LOS based on speed for p.m. peak hours only, while San Mateo County data includes a speed- or

Table 3.3-6
Existing Freeway Operations (External Locations)

Freeway	Segment	Peak Hour	Existing Speed, Density, or V/C NB/EB	Existing Speed, Density, or V/C SB/WB	Existing LOS NB/EB	Existing LOS SB/WB	Existing HOV?	Number of Mixed-Flow Lanes NB/EB	Number of Mixed-Flow Lanes SB/WB
SR 85	Homestead to Fremont	AM	114.0	38.0	F	D	Y	2	2
		PM	34.0	55.0	D	E	Y	2	2
SR 85	Winchester to Saratoga	AM	75.0	28.0	F	D	Y	2	2
		PM	26.0	60.0	D	F	Y	2	2
SR 85	Almaden to Camden	AM	52.0	26.0	E	D	Y	2	2
		PM	34.0	34.0	D	D	Y	2	2
SR 17	Bear Creek to SR 9	AM	77.0	17.0	F	C	N	2	2
		PM	18.0	64.0	C	F	N	2	2
SR 87	Curtner to Almaden	AM	82.0	18.0	F	C	N	2	2
		PM	34.0	75.0	D	F	N	2	2
SR 87	Julian to Taylor	AM	173.0	14.0	F	B	N	2	2
		PM	17.0	29.0	C	D	N	2	2
US 101	Cochrane to Scheller	AM	59.0	24.0	F	C	N	3	3
		PM	31.0	29.0	D	D	N	3	3
US 101	Tully to Story	AM	113.0	22.0	F	C	Y	3	3
		PM	26.0	76.0	D	F	Y	3	3
US 101	McKee to Old Oakland	AM	134.0	17.0	F	C	Y	3	3
		PM	21.0	51.0	C	E	Y	3	3
US 101	DeLaCruz to Montague	AM	52.0	26.0	E	D	Y	3	3
		PM	33.0	116.0	D	F	Y	3	3
US 101	Oregon/Embarcadero to	AM	60.0	95.0	F	F	Y	3	3
	University	PM	88.0	91.0	F	F	Y	3	3
US 101	Woodside to Whipple	AM	58	32	E	F	Y	3	3
		PM	53	40	F	F	Y	3	3
SR 84	University to Alameda Co.	AM	0.45	1.45	A	F	N	3	3
	Line	PM	1.57	0.48	F	A	N	3	3
I-280	Saratoga to Lawrence	AM	79.0	39.0	F	D	Y	3	3
		PM	30.0	49.0	D	E	Y	3	3
I-680	SR 237 to Jacklin	AM	52.0	33.0	E	D	N	3	3
		PM	71.0	38.0	F	D	N	3	3
I-680	Scott Creek to SR 238	AM	N/A	N/A	N/A	N/A	N	3	3
		PM	47	66	D	A	N	3	3
I-680	SR 84 to Bernal	AM	N/A	N/A	N/A	N/A	N	3	3
		PM	58	63	B	A	N	3	3
I-680	I-580 to Alcosta	AM	N/A	N/A	N/A	N/A	N	3	3
		PM	66	62	A	A	N	3	3
I-580	I-205 to SR 84/1st	AM	N/A	N/A	N/A	N/A	N	4	4
		PM	50	61	C	A	N	4	4
I-580	Santa Rita to I-680	AM	N/A	N/A	N/A	N/A	N	4	4
		PM	13	65	F	A	N	4	4
I-880	SR 237 to Dixon	AM	25.0	32.0	D	D	N	3	3
		PM	68.0	29.0	F	D	N	3	3
I-880	Alv.-Niles to Tennyson	AM	N/A	N/A	N/A	N/A	N	4	4
		PM	24	59	F	B	N	4	4
SR 237	Zanker to McCarthy	AM	33.0	103.0	D	F	Y	3	3
		PM	102.0	30.0	F	D	Y	3	3
SR 237	FairOaks to Lawrence	AM	45.0	29.0	D	D	Y	2	2
		PM	21.0	33.0	C	D	Y	2	2

Notes:

[1] Lanes, speed (XX), density (YY Y) and/or LOS (Z ZZ) from VTA 2000 CMP Monitoring Data, Alameda County CMP 2000 LOS Monitoring Report, and San Mateo County CMP 1999 Monitoring Report

[2] LOS based on density presented in VTA CMP monitoring report

Capacity assumes 2,300 vehicles per hour per lane (vphpl) for six- or more lane freeways and 2,200 vphpl for four-lane freeways

volume-to-capacity ratio-based LOS for both the a.m. and p.m. peak periods. As noted above, the detailed freeway analysis is included in the impacts discussion section of this EIS.

g. Internal Roadway Segment Levels of Service

With the closure of Moffett Field as a military base, most roadways within Ames Research Center carry only low volumes of traffic. Peak period volumes are typically less than 400 vehicles per hour in the peak direction. This level of traffic volume suggests no capacity issues on internal roads. Observations of key internal intersections also revealed no capacity or delay problems. Furthermore, it must be recognized that the proposed development plans would not only significantly change the travel patterns within the development area, but also involve re-design of the roadway network itself. For these reasons, the existing LOS for internal roadway facilities was not calculated, although observations suggest that all facilities operate at LOS B or better.

In addition, traffic counts were conducted at key segments throughout Ames Research Center and on local roadways adjacent to the study site, including the ramps at both the Moffett Boulevard and Ellis Street interchanges. A total of 27 segments were counted using automated tube counters. Data was collected for a minimum of three midweek days (Tuesday through Thursday) or 72 hours. The counts were conducted over a two-week period encompassing May 18 through May 20 and May 25 through May 27, 1999. In addition, re-counts were performed on July 28, 1999 at the four off-site segments along Moffett Boulevard plus the northbound ramps at the Moffett interchange. These re-counts were necessary because of errors in the original (May) count data. Table 3.3-7 summarizes the average weekday daily, AM peak hour, and PM peak hour results for all on-site segments. Saturday and Sunday counts were conducted at two locations and are also included in Table 3.3-7.

2. Existing Public Transit Service

The primary transit service provider in the Ames Research Center area is the VTA, which operates bus and Light Rail Transit (LRT) service throughout Santa Clara County. Existing service to Ames Research Center includes LRT

TABLE 3.3-7 **ON-SITE ROADWAY SEGMENT TRAFFIC VOLUMES**

Segment	Location	Direction	Daily	AM Peak	PM Peak	Sat.	Sun.
GATES							
Clark Memorial Drive	East of Main Gate	EB	8,376	856	227	7,194	5,283
		WB	8,987	211	901	6,022	5,244
Gate 17	East of R.T. Jones	EB	1,080	118	23		
		WB	1,229	23	212		
Ellis Street	East of Manila	EB	2,523	294	76		
		WB	2,256	93	157		
5th Avenue	West of Macon	EB	N/A	34	30		
		WB	N/A	18	43		
ON-SITE ROADWAYS							
R.T. Jones Road	North of Clark Memorial	NB	5,782	225	290	3,507	2,600
		SB	4,717	245	343	3,404	2,521
Arnold Avenue	North of Clark Memorial	NB	4,103	684	52		
		SB	1,266	0	229		
DeFrance Road	North of Bush Circle	NB	1,712	237	37		
		SB	2,046	44	249		
Mark Road	North of Bushnell	NB	2,174	303	42		
		SB	2,538	142	236		
King Road	East of DeFrance	EB	565	56	15		
		WB	573	38	35		
Bushnell Road	East of Clark Memorial	EB	346	24	6		
		WB	2,280	47	350		
North Akron Road South Akron Road	East of Clark Memorial	EB	3,152	108	312		
		WB	4,073	463	187		
Westcoat Road	East of Clark Memorial	NB	2,256	154	137		
		SB	513	21	45		
Girard Road	West of Cody	NB	205	19	16		
		SB	157	19	11		
Edquiba Road	West of Cody	NB	1,536	52	103		
		SB	1,404	63	131		
Cody Road	North of Edquiba	NB	2,152	215	121		
		SB	2,055	99	192		
Macon Road	East and North of Ellis	NB	1,186	32	105		
		SB	1,119	101	40		
	North of 5th Avenue	NB	977	81	35		
		SB	977	29	72		

Source: NASA, 1999.

service plus several bus lines. LRT service is currently provided between downtown Mountain View and south San Jose. Service is provided 24 hours a day at 10-minute headways during the peak periods and 20-minute to 60-minute headways during other periods. The closest station to the project site is the Bayshore Station located near the Ellis Street/Manila Drive intersection, which includes a "kiss-and-ride" area. No shuttles service is currently provided between this station and the NRP or Ames Campus areas.

Only one bus transit route (Route 51) provides direct service to Ames Research Center. Route 51 operates between Vallco Fashion Park in Cupertino and the Ames Campus area, including service to downtown Mountain View. In the AM and PM peak periods, buses are routed through the ARC campus; during off-peak periods and weekends, buses loop through the Orion Park Military Housing area without entering ARC. Service is provided at 30- to 60-minute headways on weekdays and at 60-minute headways on weekends. Additional express and fixed-route bus service is provided in the Moffett Park area in Sunnyvale (Routes 26, 54, 122, 321, 328, and 520) and on Ellis Street, Whisman Road, and Middlefield Road (Routes 32, 48, 304, 305, and 345) in Mountain View. However, these routes do not provide service close enough to the project site to generate substantial ridership.

Regional transit service is provided via the Caltrain and Altamont Commuter Express (ACE) commuter rail systems. Caltrain operates between Gilroy and San Francisco, with the nearest station located in downtown Mountain View. NASA currently operates a shuttle between the Ames Campus area and the Mountain View Caltrain station. Shuttles currently run between 6:10 and 9:25 in the morning, and between 2:48 and 5:48 in the afternoon. The closest ACE rail station is the Great America station located on Lafayette Street at Tasman Drive. Patrons can transfer directly to the LRT at the Lick Mill station. Existing transit service within the study area is shown on Figure 3.3-4.

Specific VTA and Caltrain ridership data for Ames Research Center is somewhat limited. According to the VTA, a total of approximately 150 persons board and depart the LRT at the NASA/Bayshore Station. A total of

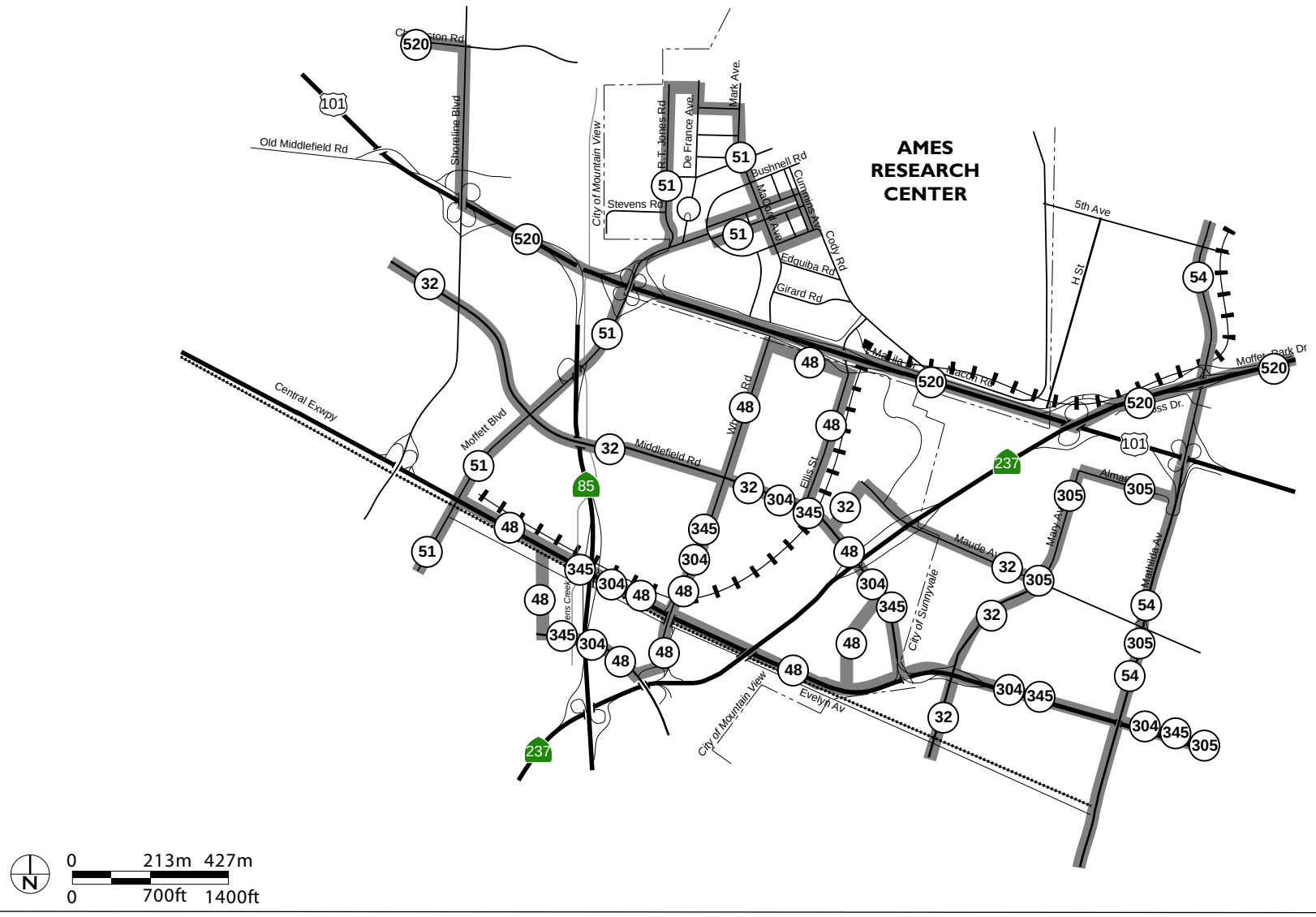
64 persons board and depart the Route 51 bus within Ames Research Center. In addition, approximately 100 people at Ames Research Center currently participate in NASA's transit pass subsidy program. Daily directional ridership on NASA's shuttle to Caltrain varies between 40 and 60 according to NASA staff. NASA's shuttle also goes to the LRT station.

3. Existing Bicycle and Pedestrian Facilities

Currently, there are bicycle facilities at two locations within Ames Research Center. In the north, there are marked bicycle lanes on Wright Avenue between the Moffett Extension and Hunsaker Road. To the south, a separate bicycle path was recently constructed adjacent to Macon Road between Ellis Street and the Lockheed Gate on 5th Avenue. Throughout the remainder of Ames Research Center, the low traffic volumes and the availability of sidewalks or shoulders provide a reasonable environment for pedestrians and cyclists, respectively.

The Santa Clara County Bikeways map identifies several bicycle facilities in the vicinity of Ames Research Center. To the west, the Stevens Creek Trail intersects with Moffett Boulevard and Middlefield Road, and both cyclists and pedestrians can access Ames Research Center via a bridge over the creek and a gate located in the housing area. The Stevens Creek Trail is currently a 5.6-kilometer (3.5 mile) trail extending between Shoreline Park and Landels School in downtown Mountain View, and is ultimately planned to be extended to Cupertino.

Moffett Boulevard is a designated bike route between the main gate of Ames Research Center and downtown Mountain View. Bike lanes have been marked on Moffett Boulevard beginning on the west side on the Highway 101 interchange. Bicycle travel through the Moffett Boulevard interchange is considered difficult because bicyclists must cross weaving vehicle traffic using the loop and high-speed direct ramps.



Source: Fehr & Peers Associates, Inc.

Cal Train

Light Rail

Bus Routes

FIGURE 3.3-4

EXISTING TRANSIT SERVICE

NASA AMES RESEARCH CENTER

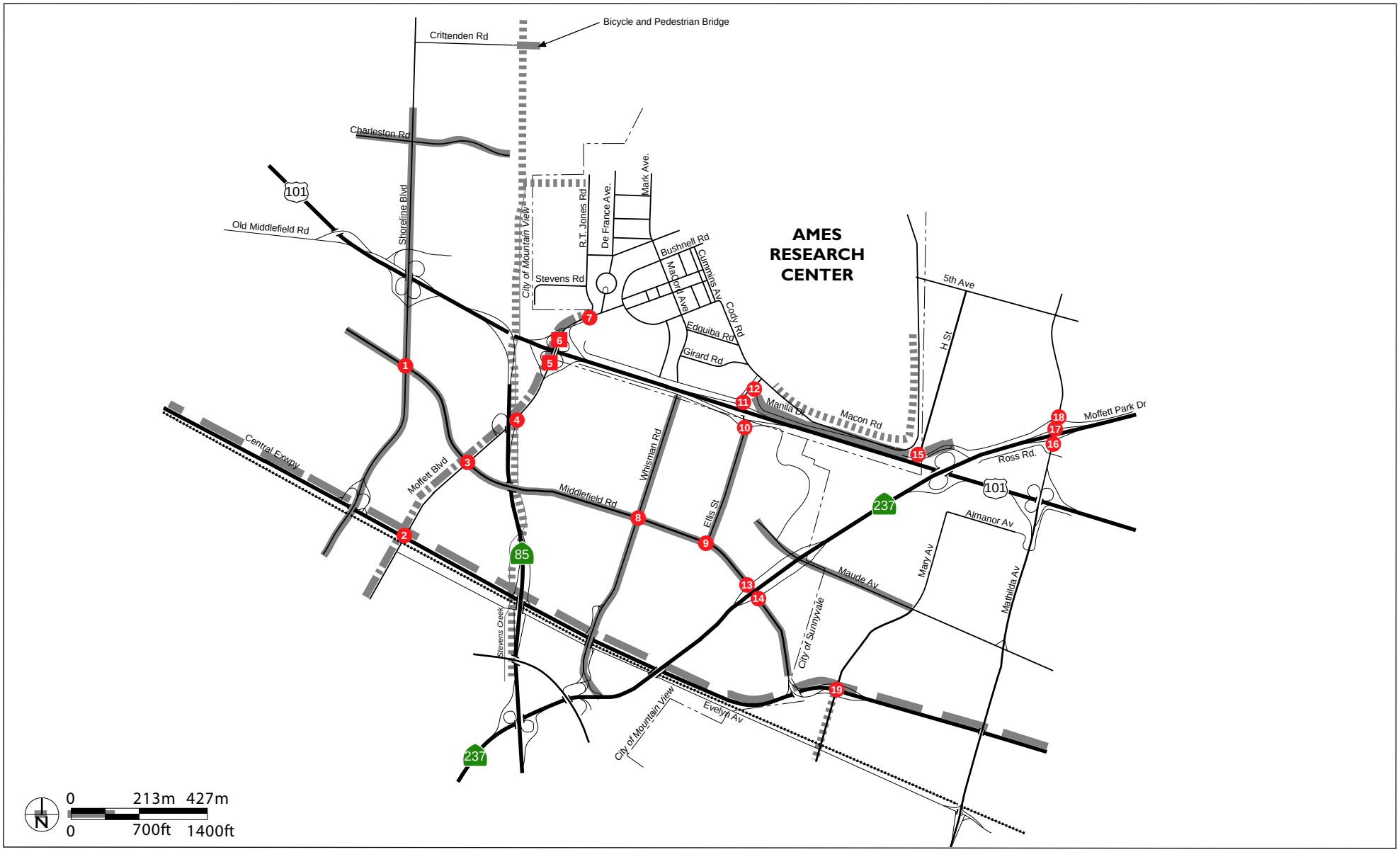
NASA AMES DEVELOPMENT PLAN FINAL EIS

Bike lanes are also marked on Ellis Street on the west side of the Highway 101 interchange. Bicycle travel through the Ellis Street interchange is also considered difficult because cyclists must share the relatively narrow travel lanes with vehicles under the Highway 101 overpass. Designated bike lanes are provided on Manila Drive east of Ellis Street.

Designated bicycle facilities on the eastern side of Ames Research Center are limited. A portion of H Street includes bicycle lanes, but no facilities are provided on either Mathilda Avenue or 5th Avenue. However, Manila Avenue along the southern edge of the airfield and Moffett Park Drive to Mathilda Avenue is a Santa Clara County-designated bicycle route. The high level of congestion through the Highway 237/Mathilda Avenue interchange during peak periods and the overall character of the road as a high-capacity arterial with multiple travel and turn lanes is considered detrimental to bicycle travel. Combined, the available facilities provide for a reasonable level of bicycle access to the Ames Research Center area but the gaps in exclusive bicycle facilities across Highway 101 and Highway 237 limit the attractiveness to cyclists. Existing bicycle facilities within the study area are shown on Figure 3.3-5.

Sidewalks currently exist on many Ames Research Center roadways, including most of those within the Ames Campus area and the Shenandoah Plaza Historic District. In the remaining area of ARC, the provision of pedestrian facilities is less consistent. For example, there are no sidewalks on Cody Road, and sidewalks are missing on parts of Edquiba and Girard Roads. In general, however, sidewalks are provided in those areas with higher pedestrian activity. Pedestrian concerns center around sufficient street lighting and non-standard marking and signing of street crossings.

Outside of Ames Research Center, sidewalks currently exist on Moffett Boulevard, Ellis Street, and Manila Drive. Similar to the existing bicycle facilities, the lack of exclusive pedestrian facilities across Highway 101 severely limits the viability of pedestrian activity as an alternative travel mode.



Source: Fehr & Peers Associates, Inc.

Bike Path
Bike Lane
Bike Route
Bikes Permitted on Expressway Shoulders

FIGURE 3.3-5

EXISTING BICYCLE FACILITES

NASA AMES RESEARCH CENTER
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4. Transportation Demand Management

NASA has established a number of Transportation Demand Management (TDM) or similar programs for employees that help reduce the number of automobiles trips generated by the existing uses in the Ames Campus and NASA Research Park areas. These programs include:

- **Caltrain and Light Rail Shuttle:** As described earlier, NASA operates a direct shuttle between the Ames Campus area and the Caltrain station in downtown Mountain View. Directional ridership (e.g. number coming into ARC in the morning or leaving in the afternoon) varies between 40 and 60 people per day, depending on the season. NASA also provides shuttle operations to serve the Bayshore LRT station near the Ellis Street/Manila Street intersection.
- **Transit Pass Subsidies:** All civil servants (NASA employees and military personnel) at Ames Research Center are eligible for reduced-cost transit passes ($30 off the monthly pass for any Bay Area transit service). Approximately 100 people participate in this program, with over fifty percent (50%) purchasing Caltrain passes and thirty-five percent (35%) purchasing VTA passes.
- **Preferred Parking for Carpoolers:** To encourage carpooling, NASA provides preferred parking for registered carpool vehicles. At present, over 360 people are enrolled in the program, with 170 vehicle passes issued. The high availability of parking may reduce the number of employees that register for this program. Thus, the program numbers do not reflect the total number of carpoolers at ARC. Participation in this program may be expected to increase under the proposed development plans as NASA employees are concentrated in the Ames Campus area, access to parking in the Historic District is reduced, and the demand for parking within ARC as a whole, increases.
- **Flexible Work Schedules:** Under a NASA-wide policy, employees can work flexible schedules with the approval of their supervisor. Options include starting as early as 6:00 a.m., working a compressed schedule that allows for every second Monday or Friday off, or working four 10-hour

days per week. Detailed information on the impact of this program is not available, however informal inquiries revealed that many employees take advantage of this flexibility to avoid commuting during the worst of the peak hours.

- **Telecommuting:** On a limited, case-by-case basis, employees can make arrangements with their supervisor to telecommute. Because this is done on an individual basis and not as part of a specific program, information on the number of telecommuters is not available.
- **Bicycle Lockers:** Bicycle lockers are provided at several locations throughout the Ames Campus area. These lockers are intended for employees who cycle to work at least three days per week. Currently, 94 people have registered for lockers. In addition, the VTA recently installed six bicycle lockers at the Bayshore LRT station at employees' requests.
- **"Community" Bicycles:** A number of individual branches and divisions with the Ames Campus area have purchased bicycles that may be used by their employees for travel within the campus. This program is not available to all employees, and impacts only internal trip-making.

Overall, the existing TDM programs result in an estimated 21 percent reduction in the number of single-occupant vehicle trips generated by the NASA-controlled portion of Ames Research Center relative to the typical number of single-occupant trips that would otherwise be expected from a similar number of employees in Santa Clara County. Additional opportunities for employees and visitors to use alternative modes of travel will be provided by the extension of the Tasman East VTA light rail line from I-880 in Milpitas to Hostetter Road in San Jose (scheduled for Fall 2004), as well as further expansion of ACE train service between the Central Valley and Santa Clara County, including accommodation of additional bicycles on each train.

5. Parking

Parking is currently accommodated at a number of lots and on-street locations through ARC. An inventory conducted in February and March of 1999 identified over 10,000 parking stalls or spaces within the entire Ames Research

Center complex. Of these, over 6,000 are located within the proposed NASA Research Park area and the remainder are located in the Ames Campus (north of Bushnell Road) and in the Eastside/Airfield area. With the current level of activity in this area, the parking supply greatly exceeds the demand. While the project would greatly increase the level of activity and parking demand, it also includes significant changes in the supply of parking, including the construction of several new parking facilities. However, parking supply in the NRP and Bay View areas would be kept relatively small, and personnel would be required to pay for parking in order to encourage the use of alternative modes.

D. Future Cumulative Conditions

As noted in Chapter 2, this EIS evaluates a future case that will vary from existing conditions in several ways. Under future cumulative conditions, projects already approved as the baseline under the CUP and CANG EA's will have occurred. Cumulative projects foreseen in Mountain View and Sunnyvale, as well as overall traffic growth in other areas, will also have occurred. This section analyzes transportation conditions under future cumulative conditions.

1. Background Traffic Growth

Development projects in other cities and throughout the Bay Area will contribute to traffic growth within the study area. The methodology used for forecasting future background traffic volumes follows that described in *Transportation Impact Analysis Guidelines* published by the VTA as part of the Santa Clara County CMP. Future year traffic forecasts were developed using a combination of the CMP countywide travel demand forecasting model and City of Mountain View and Sunnyvale standards for transportation impact studies.

As with all travel demand forecasting models, this model uses projections or assumptions regarding future year land uses and the transportation network as

inputs to estimate future travel demand. This model was originally developed by the Center for Urban Analysis and is now maintained by the VTA. The model forecasts originally reviewed in this analysis were produced in late 1999 for other projects, and data from forecasts produced in early 2001 also support the conclusions listed below.

Forecasts from the travel demand model were not used directly. Cumulative future year forecasts are typically developed by comparing base year model and horizon or future year model forecasts and applying the resultant ratio to existing traffic volumes. The base year for the VTA model is 1997 and the future year forecasts are for Year 2025. However, a comparison of base year and future year model forecasts showed that the 2025 AM and PM peak hour link volumes were lower than corresponding 1997 model volumes at numerous locations within the study area including on freeway segments. The projected reductions are likely the result of at least two factors: 1) a projected improvement in the jobs-housing balance in the region resulting in shorter trip lengths and less congestion, and 2) substantial changes in overall land uses that will change travel patterns. For those locations where model forecasts did increase, the average increase resulted in an average annual growth rate of one percent.

The City of Mountain View uses a more conservative annual growth factor of two percent for near term studies. Thus, a factor of two percent per year for the first three years (2000 to 2002) plus a factor of one percent per year for the next eleven years (to 2013) was applied to existing intersection volumes. These growth rates were used for all turning movement volumes at street intersections including those projected to decrease by the model. Since most of the freeway segments are already congested, an annual growth factor of 0.5 percent per year was applied to all existing freeway volumes to estimate 2013 traffic volumes.

2. Cumulative Projects

Cumulative projects studied in this EIS includes the baseline projects approved under the CUP and CANG EA's at Ames Research Center, as well as proposed, pending, approved and recently constructed development projects

in the Cities of Mountain View and Sunnyvale. All of this development is described in Chapter 2 of this EIS.

The amount of traffic generated by these projects was estimated based on their corresponding traffic studies or using standard rates published in *Trip Generation* (Sixth Edition, Institute of Transportation Engineers). A summary of trip estimates for the CUP uses are presented in Table 3.3-8, and the list of approved/pending projects is presented in Table 2-8 in Chapter 2. Trip generation from these approved and pending cumulative projects is contained in Appendix B. The total number of trips generated by the baseline uses at NASA were reduced by a total of 4.5 percent per VTA and Mountain View guidelines to account for TDM measures (the proximity of employment to light rail service, a shuttle program, and improved on-site bicycle and pedestrian facilities). No reductions were applied to approved and pending project trips in the adjacent cities.

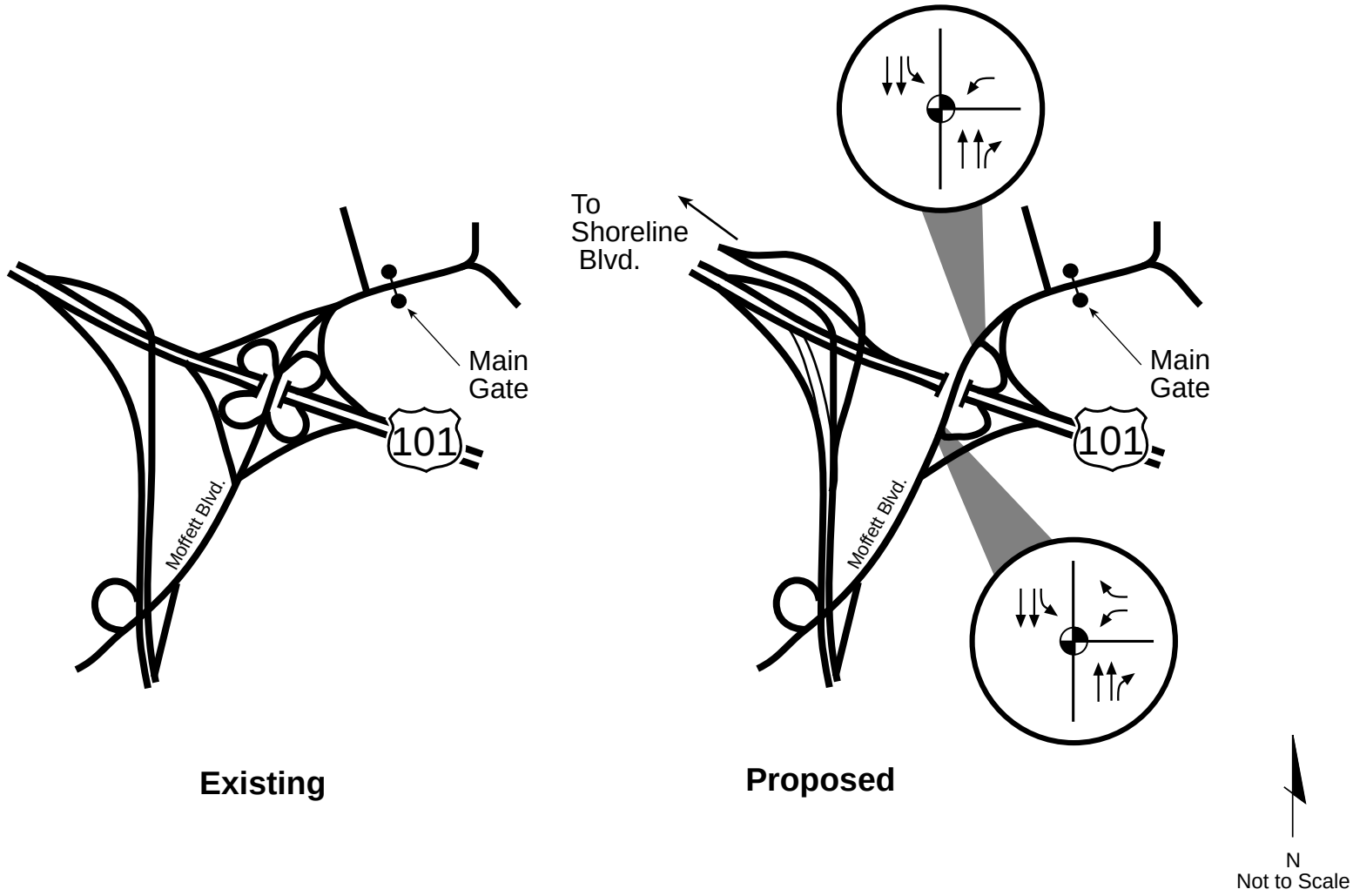
Trips associated with all of the baseline uses were assigned to the roadway network based on the same distribution of project traffic described in the Impacts Discussion section (Section 4.3). Trips from cumulative projects were assigned based on data from the corresponding traffic study or based on the location of growth-factored existing volumes described above. Thus, future cumulative traffic volumes for 2013 include existing traffic, traffic from regional growth, traffic from the approved and pending cumulative projects in Mountain View and Sunnyvale listed in Chapter 2, as well as traffic from already approved baseline projects in the Ames Research Center. In Section 4.3, future cumulative volumes will be used as the base case against which to identify potential project impacts.

TABLE 3.3-8 **TRIP GENERATION SUMMARY – ALTERNATIVE I**

	Trips						
		AM			PM		
	Daily	In	Out	Total	In	Out	Total
NRP Total	5,847	866	75	941	118	794	912
On-site Housing Reduction	0	0	0	0	0	0	0
TDM Trip Reductions (4.5%)	-263	-39	-3	-42	-5	-36	-41
Net NRP Trips	**5,584**	**827**	**72**	**899**	**112**	**759**	**871**
Total Net Trips	**5,584**	**827**	**72**	**899**	**112**	**759**	**871**

3. Planned Transportation Improvements

The most notable improvement proposal for the study area is the re-design of the Highway 101/SR 85 interchange. This project will reduce the number of merge/diverge and weaving situations on the freeway. Doing so is intended to bring this section of freeway up to current Caltrans standards, improve safety, and reduce system breakdowns due to incidents. It is also anticipated that the project will result in overall higher operating level-of-service (LOS) for all facilities in the project area. The proposed improvements include adding auxiliary lanes, collector roads, braided ramps, direct HOV lane connector ramps, and reconfiguring existing interchanges. This includes reconfiguration of the Moffett Boulevard interchange from its existing standard cloverleaf design. The proposed design includes the elimination of selected ramps, reconfiguration of the remaining ramps, and the construction of two new signalized intersections on Moffett Boulevard, as shown in Figure 3.3-6. Construction of this project is expected to begin in 2002 and be complete by 2005. The modified interchange was included in the analysis, and the two new



Source: Fehr & Peers Associates, Inc.

FIGURE 3.3-6

PLANNED MOFFETT/ HIGHWAY 85 INTERCHANGE IMPROVEMENTS

signalized intersections were used in the Future Cumulative and Project Conditions analyses.

No other changes to existing street intersection lane configurations were assumed under Future Cumulative No Project Conditions. Accordingly, the configuration of the Moffett Boulevard/Clark Memorial Drive and Ellis Street/Manila Drive intersections were assumed to remain unchanged (i.e.,unsignalized), even with the addition of traffic from developments previously approved under the CUP.

The cities of Sunnyvale and Mountain View have identified planned transportation improvements in their respective General Plan Land Use and Transportation or Circulation Elements. Major improvements expected to affect the key study intersections are proposed in both documents. In Sunnyvale, for example, the Land Use and Transportation Element foresees the construction of the Mary Avenue overcrossing to H Street over Highway 101 and the construction of an urban interchange at the Central Expressway/Mary Avenue intersection. However, neither sources for full funding of both of these improvements nor a schedule for implementation has been identified. As such, they were not included in the future cumulative analysis. This ultimately results in a more conservative analysis of project intersection impacts.

Although other changes to bicycle, pedestrian, and transit facilities and services will occur during the next five to 15 years, it is not possible to determine the scope of these changes or which planned (but not funded) improvements might be implemented. By not assuming improvements to each alternative mode, the environmental analysis is considered more conservative and better highlights potential project impacts. For informational purposes, several planned and proposed improvements are described below.

The San Francisco Bay Trail is a trail and path system approximately 640 kilometers (400 miles) long that will ultimately encircle the Bay, and will include crossings of all of the toll bridges. At this time, 340 kilometers (210 miles) have been completed, although Ames Research Center forms a gap in the

southern link between Shoreline Park in Mountain View and Moffett Park in Sunnyvale. The Association of Bay Area Governments (ABAG), in cooperation with the South Bay Ad Hoc Committee of the San Francisco Bay Trail coalition, is studying the feasibility of extending the cycling and hiking trail through the Ames Research Center area. According to information on the ABAG website, the current proposed alignment for the Bay Trail is along the north side of Ames Research Center, near the waters of San Francisco Bay. Completion of the trail will vastly improve continuous non-automobile access to the area east of Highway 101. Design elements such as vegetative buffers and fencing will have to be incorporated between the trail in certain areas (e.g., the runways) to maintain a safe public area. To this end, NASA and ABAG have signed a Bay Trail planning Memorandum of Understanding (MOU).

The VTA plans to extend light rail service in east San Jose beyond the extension currently under construction in Milpitas on Tasman Drive and Great Mall Parkway. Service is ultimately planned to extend to Eastridge Mall and State Route 87, where the existing Guadalupe line operates. The Vasona line will provide service between Los Gatos and downtown San Jose. In addition, Santa Clara County voters recently approved a 30-year ½-cent sales tax extension for transit improvements that will fund an extension of Bay Area Rapid Transit (BART) service from its existing terminus in Fremont to San Jose and Santa Clara. This extension is expected to take at least 10 years to design and construct. However, these new transit services will provide travel alternatives and will help to reduce the number of single-occupant vehicle trips in the south Bay Area.

The City of Sunnyvale has plans to construct pedestrian/bicycle bridges on Borregas Avenue over Highway 101 and SR 237 east of the study area. Bike lanes on Moffett Park Drive east of Mathilda Avenue are also planned. These facilities will improve access across these freeways and provide an alternative to the congested Mathilda Avenue corridor for bicyclists.

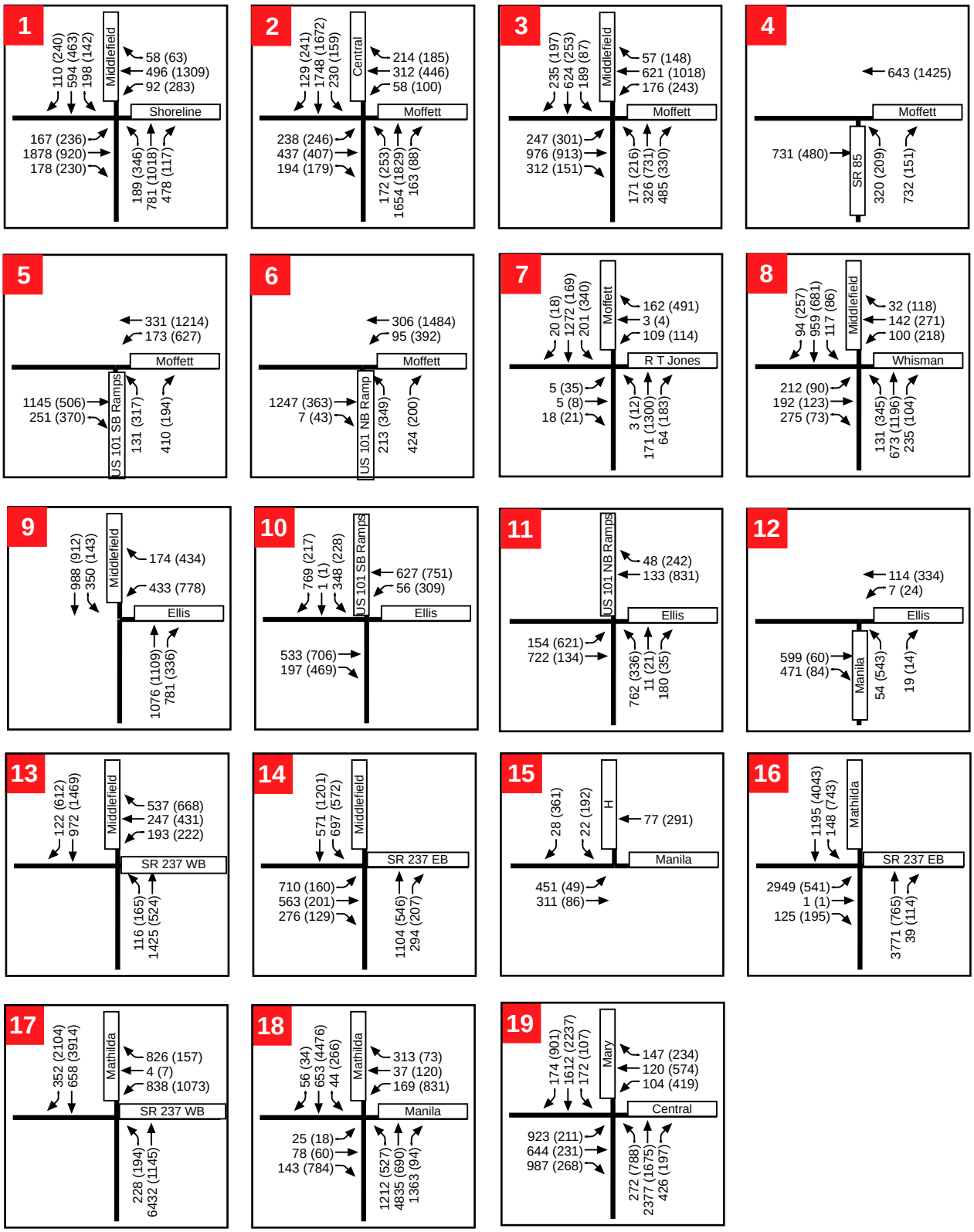
4. Future Cumulative Intersection Operations

Traffic volumes under Future Cumulative Conditions without the Project are illustrated on Figure 3.3-7 and include existing traffic volumes, traffic from regional growth, and approved/pending project development traffic. These volumes and the existing and planned transportation improvements were used to calculate intersection levels of service under 2013 Future Cumulative No Project conditions. The results of this analysis are presented in Table 3.3-9.

This analysis shows that six of the study intersections are projected to operate at unacceptable levels (LOS E or F) based on Mountain View and Sunnyvale operating standards. The LOS results also indicate that there is still some available capacity at the remaining intersections even with the addition of approved and pending projects and regional growth.

5. Future Cumulative Freeway Operations

Freeway segment operations are affected by numerous factors including ramp operations, downstream bottlenecks, incidents (i.e., accidents), etc. Because of these variables and the inability to predict future speeds on the freeway mainline, there is no accurate method available to evaluate impact to operations of adding project-generated traffic on a segment already operating at LOS F under stop-and-go conditions. Accordingly, future cumulative freeway operations without the project in 2013 were not estimated.



not to scale

Source: Fehr & Peers Associates, Inc.

XX (YY) = AM (PM) Peak Hour Traffic Volumes

FIGURE 3.3-7

BASELINE 2013 NO PROJECT VOLUMES

TABLE 3.3-9 **2013 FUTURE CUMULATIVE INTERSECTION LEVELS OF SERVICE (WITHOUT THE PROJECT)**

Intersection	Peak Hour	Delay (sec)[a]	LOS[b]
1. Middlefield Road/Shoreline Boulevard	AM	*48.5*	*E*
	PM	*48.5*	*E*
2. Moffett Boulevard/Central Expressway*	AM	48.0	E
	PM	53.4	E
3. Moffett Boulevard/Middlefield Road	AM	36.1	D
	PM	36.1	D
4. Moffett Boulevard/SR 85 NB Ramp	AM	11.3	B
	PM	5.6	B+
5. Moffett Boulevard/US 101 SB Ramps	AM	10.3	B
	PM	12.1	B
6. Moffett Boulevard/US 101 NB Ramps	AM	10.6	B
	PM	11.2	B
7. Moffett Boulevard (Clark Road)/ R.T. Jones Road	AM	*63.8*	*F*
	PM	*196.6*	*F*
8. Whisman Road/Middlefield Road	AM	13.6	B-
	PM	15.1	C+
9. Ellis Street/Middlefield Road	AM	21.6	C
	PM	17.2	C
10. Ellis Street/US 101 SB Ramps	AM	21.3	C
	PM	16.8	C+
11. Ellis Street/US 101 NB Ramps	AM	18.2	C
	PM	11.8	B
12. Ellis Street/Manila Road	AM	10.8	B
	PM	20.5	C
13. Middlefield Road/SR 237 WB Ramps	AM	15.3	C+
	PM	19.4	C+
14. Middlefield Road/SR 237 EB Ramps	AM	19.3	C
	PM	12.7	B
15. Manila Road/H Street	AM	7.1	B
	PM	11.0	B
16. Mathilda Avenue/SR 237 EB Ramps	AM	*100.5*	*F*
	PM	17.3	C
17. Mathilda Avenue/SR 237 WB Ramps	AM	*284.6*	*F*
	PM	*>360*	*F*
18. Manila Road (Moffett Park Extension)/ Mathilda Avenue	AM	*>360*	*F*
	PM	*339.3*	*F*
19. Central Expressway/Mary Avenue*	AM	*85.6*	*F*
	PM	48.6	E

[a] Whole intersection weighted average stopped delay expressed in seconds per vehicle
[b] LOS calculations for signalized intersections performed using the 1985 *Highway Capacity Manual* methodology contained in the TRAFFIX software package with adjusted saturation flow rates to reflect local conditions.
[C] LOS calculations for unsignalized intersections performed using the 1997 *Highway Capacity Manual* methodology contained in the TRAFFIX software package.
*Denotes CMP intersection with LOS E standard. All other locations use LOS D standard.
Unacceptable levels of operation are shown in *italics*.

3.4 AIR QUALITY

This section describes ambient air quality conditions at Ames Research Center. The ambient air quality in a given area depends on the quantities of pollutants emitted within the area, transport of pollutants to and from surrounding areas, local and regional meteorological conditions, and the surrounding topography of the air basin. Air quality is described by the concentration of various pollutants in the atmosphere. Units of concentration are generally expressed in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$). The significance of a pollutant concentration is determined by comparing the concentration to an appropriate ambient air quality standard, which restricts allowable pollutant concentrations to protect public health and welfare while including a reasonable margin of safety to protect the more sensitive individuals in the population.

The project site is located within the San Francisco Bay Area Air Basin. The basin includes the counties of San Francisco, Santa Clara, San Mateo, Marin, Napa, Contra Costa, and Alameda, along with the southeast portion of Sonoma County and the southwest potion of Solano County. The local air quality regulatory agency responsible for the basin is the Bay Area Air Quality Management District (BAAQMD).

The following sections describe climatic and meteorological conditions in the project area, and summarize measured air pollutant concentrations representative of existing project conditions. The implications of federal, State, and local air quality regulations are also discussed.

A. Climate and Meteorological Conditions

The climate at Ames Research Center is characterized by warm dry summers and cool moist winters. The proximity of the San Francisco Bay and the Pacific Ocean has a moderating influence on the climate.

The major synoptic feature controlling the area's climate is a large high pressure system located in the eastern Pacific Ocean, known as the Pacific High. The strength and position of the Pacific High varies seasonally. It is at

its strongest when it is located off the west coast of the United States during the summer. Large-scale atmospheric subsidence associated with the Pacific High produces an elevated temperature inversion along the West Coast. The base of this inversion is usually located from 300 to 1,000 meters (1,000 to 3,000 feet) above mean sea level, depending on the intensity of subsidence and the prevailing weather condition. Vertical mixing is often limited to the base of the inversion, trapping air pollutants in the lower atmosphere. Marine air trapped below the base of the inversion is often condensed into fog or stratus clouds by the cool Pacific Ocean. This condition is typical of the warmer months of the year from roughly May through October. Stratus clouds usually form offshore and move into the Bay Area during the evening hours. As the land warms the following morning, the clouds often dissipate, except in areas immediately adjacent to the coast. The stratus then redevelops and moves inland late in the day. Otherwise, clear skies and dry conditions prevail during summer.

As winter approaches, the Pacific High becomes weaker and shifts south, allowing pressure systems associated with the polar jet stream to affect the region. Low pressure systems produce periods of cloudiness, strong shifting winds, and precipitation. The number of days with precipitation can vary greatly from year to year, resulting in a wide range of annual precipitation totals. Precipitation is generally lowest along the coastline and Bay, with the highest amounts occurring along south and west facing slopes. Annual precipitation totals for Ames Research Center ranged from about 150 to 790 millimeters (mm) (6 to 31 inches) during the 1945 through 1993 period of record, with an annual average of 343 mm (13.5 inches).[1] About 90 percent of rainfall in the region occurs between November and April. High pressure systems in winter can produce cool stagnant conditions. Radiation fog and haze are common during extended winter periods where high pressure systems influence the weather.

[1] National Oceanic and Atmospheric Administration, 1995.

The annual average high and low temperatures at Ames Research Center are 68 degrees Fahrenheit (F) and 10 degrees Centigrade (C) or 50 degrees F, respectively. In July, the average high and low temperatures are 25 degrees C and 13 degrees C (75 degrees F and 57 degrees F), respectively, while in January the average high and low temperatures are 13 degrees C and 6 degrees C (57 degrees F and 42 degrees F. Extreme high and low temperatures recorded during the 48-year period of record were 40 degrees C and -6 degrees C (105 degrees F and 21 degrees F, respectively.[2] Temperatures along the Bay are generally less extreme compared to inland locations, due to the moderating effect of the Pacific Ocean.

The proximity of the Eastern Pacific High and relatively lower pressure inland produces a prevailing west to northwest sea breeze along the central and northern California coast for most of the year. As this wind is channeled through the Golden Gate and other gaps, it branches off to the northeast and southeast, following the general orientation of the San Francisco Bay system. As a result, the wind prevails from the north-northwest in the South Bay region and Ames Research Center during daytime hours. Nocturnal winds and land breezes during the colder months of the year prevail from the south due to drainage out of the Santa Clara Valley.

During the fall and winter months, the Pacific High can combine with high pressure over the interior regions of the western United States (known as the Great Basin High) to produce extended periods of light winds and low-level temperature inversions. This condition frequently produces poor atmospheric mixing that results in degraded regional air quality. Ozone standards traditionally are exceeded when this condition occurs during the warmer months of the year.

[2] NOAA, 1995.

B. Regulatory Background

This section describes federal, State and regional air quality standards.

1. Air Quality Standards

The Federal and California Clean Air Acts have established ambient air quality standards for different pollutants. National Ambient Air Quality Standards (NAAQS) were established by the federal Clean Air Act of 1970 (42 U.S.C. § 7401 *et seq.*, amended in 1977 and 1990) for six "criteria" pollutants. These criteria pollutants now include carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), particulate matter with a diameter less than 10 microns (PM_{10}), sulfur dioxide (SO_2), and lead (Pb). The air pollutants for which standards have been established are considered the most prevalent air pollutants known to be hazardous to human health. In 1997, EPA established an 8-hour standard for ozone and annual and 24-hour standards for very fine particulate matter ($PM_{2.5}$).

California established ambient air quality standards as early as 1969 through the California Clean Air Act. Pollutants regulated under the California Clean Air Act are similar to those regulated under the Federal Clean Air Act, but in many cases, California standards are more stringent. Federal and State air quality standards are shown in Table 3.4-1. Both the national and California ambient air quality standards have been adopted by the BAAQMD. The following sections briefly describe the six criteria air pollutants.

a. Ozone

Ground-level ozone is the principal component of smog. It is not directly emitted into the atmosphere, but is formed by the photochemical reaction of reactive organic gases and nitrogen oxides (known as ozone precursors) in the presence of sunlight. Ozone levels are highest during late spring through early summer when precursor emissions are high and meteorological conditions are favorable for the complex photochemical reactions to occur. Approximately

TABLE 3.4-1 **CALIFORNIA AND FEDERAL AMBIENT AIR QUALITY STANDARDS**

			NATIONAL STANDARDS[1]	
Pollutant	**Averaging Time**	**California Standards**	**Primary [2,3]**	**Secondary[2,4]**
Ozone	8-hour	–	0.08 ppm (176 ug/m^3)	–
	1-hour	0.09 ppm (180 ug/m^3)	0.12 ppm (235 ug/m^3)	Same as primary
Carbon Monoxide	8-Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	–
	1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	–
Nitrogen Dioxide	Annual 1-Hour	–	0.053 ppm (100 ug/m^3)	Same as primary
Sulfur Dioxide	Annual	–	0.053 pm (80 ug/m^3)	Same as primary
	24-Hour	0.04 ppm (105 ug/m^3)	0.14 ppm (365 ug/m^3)	–
	3-Hour	–	–	0.5 ppm (1,300 ug/m^3)
	1-Hour	0.25 ppm (655 ug/m^3)	–	--
PM10	Annual	30 ug/m^3 (geometric mean)	50 ug/m^3 (arithmetic mean)	Same as primary
	24-Hour	50 ug/m^3	150 ug/m^3	Same as primary
PM2.5	Annual	–	15 ug/m^3	
	24-Hour	–	65 ug/m^3	
Lead	Calendar Quarter	–	1.5 ug/m^3	
	30-Day Average	1.5 ug/m^3	–	--

Notes:
1. Standards, other than for ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.
2. Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.
3. Primary Standards: The level of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than 3 years after that state's implementation plan is approved by the EPA.
4. Secondary Standards: The level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

Source: Illingworth & Rodkin.

half of the reactive organic gas and nitrogen oxide emissions in the Bay Area are from motor vehicles. Adverse health effects of ground-level ozone include respiratory impairment and eye irritation. High ozone concentrations are also a potential problem to sensitive crops such as wine grapes.

b. Carbon Monoxide

Carbon monoxide is a non-reactive pollutant that is highly toxic, invisible, and odorless. It is formed by the incomplete combustion of fuels. The largest source of carbon monoxide emissions is motor vehicles. Wood stoves and fireplaces also contribute. Unlike ozone, carbon monoxide is directly emitted into the atmosphere. The highest carbon monoxide concentrations occur during the nighttime and early mornings in late fall and winter. Carbon monoxide levels are strongly influenced by meteorological factors such as wind speed and atmospheric stability. Adverse health effects of carbon monoxide include the impairment of oxygen transport in the bloodstream, increase of carboxyhemoglobin, aggravation of cardiovascular disease, impairment of central nervous system function, and fatigue, headache, confusion, and dizziness. Exposure to carbon monoxide can be fatal in the case of very high concentrations in enclosed places.

c. Nitrogen Dioxide

Nitrogen dioxide is a reddish-brown gas that is a by-product of combustion processes. Automobiles and industrial operations are the primary sources of nitrogen dioxides. Nitrogen dioxide contributes to ozone formation. Adverse health effects associated with exposure to high levels of nitrogen dioxide include the risk of acute and chronic respiratory illness.

d. Sulfur Dioxide

Sulfur dioxide is a colorless gas with a strong odor and potential to damage materials. It is produced by the combustion of sulfur-containing fuels such as oil and coal. Refineries and chemical plants are the primary sources of sulfur-dioxide emissions in the Bay Area. Adverse health effects associated with exposure to high levels of sulfur dioxide include aggravation of chronic

obstructive lung disease and increased risk of acute and chronic respiratory illness.

e. Inhalable Particulate Matter

Inhalable particulate matter or PM_{10} (particulate matter 10 microns or less in diameter) and $PM_{2.5}$ (particulate matter 2.5 microns or less in diameter) refers to a wide variety of solid or liquid particles in the atmosphere. These include smoke, dust, aerosols, and metallic oxides. Some of these particulates are considered toxic. Although particulates are found naturally in the air, most particulate matter found in the Bay Area is emitted either directly or indirectly by motor vehicles, industry, construction, agricultural activities, and wind erosion of disturbed areas. Most $PM_{2.5}$ is comprised of combustion products (i.e., soot). Small particulate matter may be inhaled, and possibly lodge in and/or irritate the lungs. Exposure to small particulate matter can also increase the risk of chronic respiratory illness with long-term exposure and altered lung function in children.

f. Lead

Lead occurs in the atmosphere as particulate matter. It is primarily emitted by gasoline-powered motor vehicles. Because the use of lead in fuel has been virtually eliminated, lead levels in the Bay Area have dropped dramatically, and are well below the ambient standards.

g. Toxic Contaminants

Besides the six "criteria" air pollutants described above, there is another group of substances found in ambient air referred to as Toxic Air Contaminants. These contaminants tend to be localized and are found in relatively low concentrations in ambient air. However, they can result in adverse chronic health effects if exposure to low concentrations occurs for long periods of time. They are regulated at the local, State, and federal level.

2. Federal Air Quality Regulations

This section describes the Bay Area's compliance with NAAQS, and the conformity analysis process.

a. Compliance within NAAQS

If an area does not meet one of the NAAQS over a three year time period, the EPA designates it as a "nonattainment" area for that particular pollutant. The EPA requires states with nonattainment areas to prepare and submit air quality plans showing how the standards will be met in the future or, if they cannot be met, how they can show progress toward meeting the standards. These air quality plans are referred to as State Implementation Plans (SIP). Under severe cases, the EPA may impose a federal plan.

Prior to 1998, the Bay Area was a "moderate nonattainment" area for carbon monoxide due to localized exceedances of the national carbon monoxide standards in downtown San Jose and Vallejo. The carbon monoxide standards have not been exceeded since 1991. In 1998, EPA approved the San Francisco Bay Area Redesignation Request and Maintenance Plan for the National Carbon Monoxide Standard and reclassified it as a carbon monoxide "maintenance" area.

Prior to 1995, the San Francisco Bay Area air basin was classified by the EPA as a "moderate nonattainment" area for ozone, since some air pollutant monitors in the area routinely measure concentrations exceeding the national 1-hour ozone standard. In 1993, after three years of monitoring compliance with the 1-hour ozone standard, the Bay Area Air Quality Management District (BAAQMD) submitted the 1993 Ozone Maintenance Plan to the EPA to request the redesignation of the region to an ozone maintenance area. The plan included measures to maintain the attainment of the ozone NAAQS.

The EPA, in 1995, granted the request and classified the Bay Area as a "maintenance" area after the region had not violated the ozone standard for 5 years (1990 – 1994). However, violations of the national 1-hour ozone standards occurred during the summers of 1995 and 1996. As a result, in 1997 EPA revoked the region's clean air status and designated the area as an "unclassified nonattainment" area for ozone.

In response to the redesignation of the area to an ozone nonattainment area, the Bay Area co-lead agencies (BAAQMD, the Metropolitan Transportation Commission and the Association of Bay Area Governments) prepared and submitted the San Francisco Bay Area Ozone Attainment Plan or Ozone SIP to the California Air Resources Board (CARB). This plan, which was a revision to the 1993 Ozone Maintenance Plan, was submitted to EPA in 1999. The plan includes a compilation of existing and proposed plans and regulations that govern how the region complies with the federal Clean Air Act requirements. This plan was designed to show how the region would attain the federal ozone standard by the end of the 2000 ozone season (summer) and thereafter. EPA defines attainment of the national 1-hour ozone standard as when the Bay Area does not record an exceedance of the ozone standard more than three times in a year for three consecutive years. The Bay Area continued to violate the ozone NAAQS in 1998; therefore, attainment of the standard was not possible prior to 2000. In March 2001, EPA formerly announced that the region had not attained the 1-hour ozone standard and it would only partially approve the plan. As a result, a new Ozone Attainment Plan was developed and submitted to the California Air Resources Board and EPA. This plan is required to demonstrate attainment of the 1-hour ozone standard by 2006. Currently, EPA is working with the Bay Area co-lead agencies to resolve issues with the plan. Federal funding for transportation projects throughout the Bay Area is in jeopardy until an ozone attainment plan is approved by EPA.

For all pollutants other than ozone, the San Francisco Bay Area Air Basin is in attainment of the NAAQS. The Bay Area counties, including Santa Clara County, have not measured ambient air pollutant concentrations in excess of those allowed by the NAAQS.

b. Conformity Analysis

Section 176c of the 1990 Clean Air Act Amendments outlines the "conformity" provisions for federal projects. Federal actions are required to conform with the requirements of a SIP and must not jeopardize efforts for a region to achieve the NAAQS. Section 176c also assigns primary oversight responsibility for conformity assurance to the federal agency undertaking the project, not the

EPA, state, or local agency. For there to be conformity, federally- supported or funded activities must not (1) cause or contribute to any new air quality standard violation, (2) increase the frequency or severity of any existing standard violation, or (3) delay the timely attainment of any standard, interim emission reduction, or other SIP milestone aimed at bringing the region into attainment.

In 1993, the U.S. EPA issued conformity regulations (40 CFR Parts 51 and 93) that addressed transportation projects (Transportation Conformity) and conformity of all other non-transportation federal actions (General Conformity). The primary requirements of the transportation conformity rule are that implementation of transportation plans or programs cannot produce more emissions of pollutants than budgeted in the latest SIP.

The General Conformity regulations apply to a wide range of federal actions or approvals that would cause emissions of criteria air pollutants above specified levels to occur in locations designated as nonattainment or maintenance areas. Since the Bay Area is in nonattainment (nonclassified) for ozone and is a CO maintenance area, federal projects are subject to the General Conformity regulations if they generate emissions of ozone precursor pollutants (i.e., reactive organic compounds [ROG] and nitrogen oxides [NOx]) or carbon monoxide in excess of approximately 91,000 kilograms (100 tons) per year, or if the emissions are more than 10 percent of the nonattainment or maintenance area's emission inventory for the pollutant of concern.

Projects that are subject to the General Conformity regulations are required to mitigate or fully offset the emissions caused by the action, including both direct and indirect (e.g., traffic) emissions that the federal agency has some control over. The BAAQMD adopted and incorporated the Transportation and General Conformity regulations into the SIP in 1994.

3. California Air Quality Regulations

The California Clean Air Act of 1988, amended in 1992, outlines a program for areas in the state to attain the CAAQS by the earliest practical date. The

California Air Resources Board (CARB) is the State air pollution control agency. The California Clean Air Act set more stringent air quality standards for all of the pollutants covered under national standards. It also regulates levels of vinyl chloride, hydrogen sulfide, sulfates, and visibility-reducing particulates. If an area does not meet the CAAQS, the CARB designates the area as a nonattainment area. Based on the California standards, the Bay Area is a serious nonattainment area for ozone (since the area cannot forecast attainment of the State ozone standard in the foreseeable future). It is also a state nonattainment area for PM_{10}. The Bay Area has met the CAAQS for all other air pollutants. The CARB requires regions that do not meet the CAAQS for ozone to submit clean air plans that describe plans to attain the standard.

4. Regional Air Quality Regulations and Planning

Regional air quality is regulated by the BAAQMD. The BAAQMD regulates stationary sources (with respect to federal, State, and local regulations), monitors regional air pollutant levels (including measurement of toxic air contaminants), develops air quality control strategies and conducts public awareness programs. The BAAQMD has also developed CEQA guidelines that establish significance thresholds and provide guidance for evaluating potential air quality impacts of projects and plans.

The BAAQMD has prepared the Bay Area Clean Air Plan (CAP) to address the California Clean Air Act. This plan includes a comprehensive strategy to reduce emissions from stationary, area, and mobile sources and attain the stricter State air quality standard mandated by the California Clean Air Act. The Plan is designed to achieve a region-wide reduction of ozone precursor pollutants through the expeditious implementation of all feasible measures. Air quality plans are developed on a triennial basis, with the latest plan developed in 1997 (i.e., '97 CAP). The primary objective of the '97 CAP is to reduce ozone precursor pollutants through the implementation of all feasible control measures.

C. Existing Air Quality Conditions

Air quality is affected by the rate of pollutant emissions and by meteorological conditions such as wind speed, atmospheric stability, and mixing height, all of which affect the atmosphere's ability to mix and disperse pollutants. Long-term variations in air quality typically result from changes in air pollutant emissions, while short-term variations result from changes in atmospheric conditions.

1. San Francisco Bay Region

In general, the San Francisco Bay Area is considered one of the cleanest major metropolitan areas in the country with respect to air quality. The air pollutants of greatest concern in the South Bay Area are ground-level ozone and PM_{10}, because the San Francisco Bay region as a whole does not comply with air quality standards for either pollutant. As described above, the San Francisco Bay Area annually exceeds the California Ambient Air Quality Standard for 1-hour ozone and 24-hour average PM_{10} levels. Throughout the Bay Area, the national 1-hour ozone standard was exceeded at one or more stations from 0 to 8 days annually over the last 5 years, and the new 8-hour ozone standard was exceeded from 0 to 16 days annually. The number of days that, on an annual basis, exceeded the more stringent 1-hour State ozone standard at one or more stations in the Bay Area ranged from 8 to 34 days per year over the last five years. The NAAQS for PM_{10} is not exceeded anywhere in the Bay Area, but the more stringent State standard is routinely exceeded in the Bay Area, as well as most other parts of the State. No other air quality standards are exceeded in the Bay Area. As a result, the San Francisco Bay region is considered nonattainment for ground-level ozone at both the State and federal level, and nonattainment for PM_{10} at the State level only. The San Francisco Bay region currently complies with State and federal standards for all other air pollutants (e.g., carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead).

The BAAQMD monitors air pollutant levels continuously throughout the nine-county Bay Area Air Basin. The Mountain View monitoring station,

which is closest to Ames Research Center, measures only ground-level ozone concentrations. The nearest multi-pollutant monitoring stations are in Redwood City, several kilometers to the north, and San Jose, several miles to the south. A summary of air quality monitoring data is shown in Table 3.4-2. The values in the table are the highest air pollutant levels measured at these stations over the past five years (1996-2000). The number of days that measured 7 days per year in Mountain View, while federal 1-hour ozone standards of 0.12 ppm were not exceeded. The new 8-hour standard concentrations exceeded the NAAQS or CAAQS are given in Table 3.4-3. State ozone and PM_{10} standards were exceeded on several days each year. The maximum 1-hour ozone levels exceed the State standards of 0.09 ppm on 1 to of 0.08 ppm was exceeded once in 1995 and once in 1999 at Mountain View. Other State and federal standards were not exceeded.

The BAAQMD operates a 17-station air toxics monitoring network throughout the Bay Area. The closest station to Ames Research Center is the Mountain View monitoring station. Two other nearby monitoring stations are located in Redwood City and San Jose. Compounds measured by the BAAQMD include benzene, 1,3-butadiene, carbon tetrachloride, chloroform, ethylene dibromide, ethylene dichloride, methyl tert buytl ether (MTBE), methylene chloride, perchloroethylene, toluene, 1,1,1,-Trichloroethane, trichloroethylene, and vinyl chloride. Since the ambient concentrations of these toxic air contaminants are very small, they are measured and reported as part per billion (ppb) on a volume basis. Table 3.4-4 contains a summary of the recently measured toxic air contaminant concentrations for each of the compounds at the Mountain View monitoring station in 1999, and the Redwood City and San Jose monitoring stations in 2000. Maximum, minimum, and mean concentrations are presented for each compound. Also included in Table 3.4-4 are the overall Bay Area monitoring results, which include the maximum of all measured concentrations from all stations, the minimum concentration measured, and the mean concentrations from all Bay Area monitoring stations.

TABLE 3.4-2 **AIR POLLUTANT CONCENTRATIONS NEAR AMES RESEARCH CENTER**

Pollutant	Standard	Station Location	1996	1997	1998	1999	2000	2001
PM_{10} ($\mu g/m^3$)	24-Hour	San Jose	76	78	92	114	76	77
		Redwood City	48	70	49	84	53	65
PM_{10} ($\mu g/m^3$)	Annual	San Jose	25	26	25	25	27	28
		Redwood City	21	24	25	29	21	22
CO (ppm)	8-Hour	San Jose	7.0	6.1	6.3	6.3	6.3	5.1
		Redwood City	3.6	4.2	4.1	3.8	4.4	3.9
Ozone (ppm)	1-Hour	Mountain View	0.11	0.11	0.10	0.11	–	-
		San Jose	0.11	0.09	0.15	0.11	0.07	0.11
		Redwood City	0.10	0.09	0.07	0.08	0.08	0.11
Ozone (ppm)	8-Hour	Mountain View	0.08	0.08	0.06	0.09	–	-
		San Jose	0.08	0.07	0.09	0.08	0.06	0.07
		Redwood City	0.07	0.07	0.05	0.06	0.06	0.06
Nitrogen Dioxide (ppm)	1-Hour	San Jose	0.11	0.12	0.08	0.13	0.11	0.11
		Redwood City	0.09	0.08	0.06	0.10	0.07	0.07
Nitrogen Dioxide (ppm)	Annual	San Jose	0.025	0.025	0.025	0.026	0.025	0.023
		Redwood City	0.020	0.018	0.018	0.019	0.018	0.016

Notes: $\mu g/m^3$ = micrograms per cubic meter
ppm = parts per million

Source: BAAQMD.

TABLE 3.4-3 **SUMMARY OF LOCAL AIR QUALITY EXCEEDANCES**

Pollutant	Standard	Station Location	1996	1997	1998	1999	2000	2001
Ozone	NAAQS	Mountain View	0	0	0	0	–	-
	1-Hour	San Jose	0	0	0	0	0	0
	(0.12 ppm)	Redwood City	0	0	0	0	0	0
		Bay Area	-	-	16	9	3	1
Ozone	NAAQS	Mountain View	0	0	0	1	–	-
	8-Hour	San Jose	0	0	1	0	0	0
	(0.08 ppm)	Redwood City	0	0	0	0	0	0
		Bay Area	8	0	8	9	4	7
Ozone	CAAQS	Mountain View	3	1	2	7	–	-
	1-Hour	San Jose	5	0	4	3	0	2
	(0.09 ppm)	Redwood City	1	0	0	0	0	1
		Bay Area	34	8	29	20	12	15
PM_{10}	NAAQS	San Jose	0	0	0	0	0	0
	24-Hour	Redwood City	0	0	0	0	0	0
	(150Fg/m^3)	Bay Area	0	0	0	0	0	0
PM_{10}	CAAQS	San Jose	2	3	3	5	7	4
	24-Hour	Redwood City	0	2	0	3	1	4
	(50Fg/m^3)	Bay Area	3	4	5	12	7	-
All Other	All Other	San Jose	0	0	0	0	0	0
(CO, NO_2,		Redwood City	0	0	0	0	0	0
Lead, SO_2)		Bay Area	0	0	0	0	0	0

Source: BAAQMD

As can be seen from Table 3.4-4, the maximum measured toxic air contaminant concentrations in Mountain View are all lower than highest Bay Area values. Overall, the mean toxic air contaminant concentrations in Mountain View are similar to the mean concentrations for the overall Bay Area. However, several of the highest concentrations measured in the Bay Area were measured in Redwood City (methylene chloride) and San Jose (benzene).

2. Ames Research Center

Operation of Ames Research Center currently generates air pollution emissions from aircraft operations and stationary sources. The largest source of emissions at Ames Research Center is vehicular traffic. Existing NASA operations prior to new baseline projects generate an average of approximately 24,000 vehicle trips per day. Table 3.4-5 summarizes emissions for Ames Research Center, Santa Clara County and the Bay Area.

The 1996 emissions inventory represents the most recent annual emissions inventory available for the region. As shown in Table 3.4-5, the largest contributors of NOx, CO, and ROG air pollutants in the region are mobile sources. The largest contributors to PM_{10} at NASA Ames Research Center are aircraft operations. In the region, area-wide sources are the largest contributors to PM_{10}.

TABLE 3.4-4 **SUMMARY OF RECENTLY MEASURED TOXIC AIR CONTAMINANT CONCENTRATIONS NEAR AMES RESEARCH CENTER (IN PPB)**

	Mountain View (1999)			Redwood City (2000)			San Jose (2000)			Bay Area (2000)		
Compound	**Max**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Max**	**Min**	**Mean**	**Max**	**Min**	**Mean**
Benzene	1.60	0.10	0.55	2.20	0.10	0.69	3.10	0.10	0.75	3.10	<0.10	0.46
1,3-Butadiene	0.80*	<0.30*	0.32*	1.00*	<0.30*	0.46*	1.00	0.02	0.19	NA	NA	0.17
Carbon Tetrachloride	0.12	0.09	0.10	0.12	0.08	0.10	0.12	0.09	0.10	0.16	<0.02	0.01
Chloroform	0.10	<0.02	0.02	0.07	<0.02	0.02	0.03	<0.02	0.01	0.13	0.08	0.10
Methyl Chloroform	0.11	0.05	0.07	0.62	0.05	0.11	0.13	0.05	0.07	NA	NA	NA
Ethylene Dibromide	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylene Dichloride	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Methyl Tert Butyl Ether	2.00	<0.50	0.91	5.70	<0.50	1.36	5.20	0.50	1.27	5.70	<0.50	0.73
Methylene Chloride	1.40	<0.50	0.29	1.30	0.50	0.37	1.10	<0.50	0.33	8.00	<0.50	0.36
Perchloroethylene	0.22	0.03	0.09	0.22	0.01	0.06	0.42	0.01	0.09	3.20	<0.01	0.06
Toluene	3.20	0.40	1.30	7.20	0.40	2.46	8.20	0.50	1.86	14.3	<0.10	1.24
1,1,1-Trichloroethane	0.39*	0.05*	0.10*	0.44	0.12	0.21	0.16	0.07	0.10	4.42	<0.05	0.12
Trichloroethylene	0.10	<0.08	0.05	0.75	0.08	0.17	<0.08	<0.08	<0.08	0.75	<0.08	0.05
Vinyl Chloride	<0.03	<0.03	<0.29	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30

* Based on 1998 data since 1999 or 2000 data not available.

Source: BAAQMD, CARB.

Note: ppb = parts per billion.
NA = not available.

TABLE 3.4-5 **EXISTING AIR POLLUTANT EMISSIONS INVENTORY FOR 2000**

	Emissions in Metric Tons Per Day (Tons Per Day)			
Source	**ROG**	**NO_X**	**CO**	**PM_{10}**
Ames Research Center[1]				
Aircraft Operations[2]	0.04 (0.04)	0.06 (0.07)	0.44 (0.49)	0.18 (0.20)
Stationary Sources[2]	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Mobile Sources[3]	0.15 (0.17)	0.27 (0.30)	1.58 (1.74)	0.07 (0.08)
Total	0.20 (0.21)	0.34 (0.38)	2.03 (2.24)	0.26 (0.29)
Santa Clara County				
Stationary Sources	28.1 (31)	10.9 (12)	10.9 (12)	2.7 (3)
Area-Wide Sources	20.9 (23)	3.6 (4)	34.5 (38)	38.1 (42)
Mobile Sources	69.0 (76)	94.4 (104)	597 (657)	3.6 (4)
Other	< 1	< 1	0.91 (1)	< 1
Total	118 (130)	108.9 (120)	642 (708)	44.4 (49)
Bay Area[2]				
Stationary Sources	113.5 (125)	80.8 (89)	31.8 (35)	15.4 (17)
Area-Wide Sources	81.7 (90)	15.4 (17)	153.5 (169)	118.0 (130)
Mobile Sources	289.7 (319)	410 (452)	2,418 (2,663)	19.1 (21)
Other	< 1	< 1	5.4 (6)	0.9 (1)
Total	485 (534)	506 (558)	2,609 (2,873)	153 (169)

Notes:

1. Draft 1999 and 2010 Moffett Federal Airfield Operations Assumptions using BAAQMD inventory emissions factors.
2. California Air Resources Board - 2000 Estimated Annual Average Emissions.
3. MVEI7G emissions factors applied to 24,451 daily trips.

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air quality standards 3.4-4, 3.4-5, 3.4-11, 3.4-12
Bay Area Air Quality Management District BAAQMD 3.4-1, 3.4-4, 3.4-8-3.4-15, 3.4-17, 3.4-18

3.5 INFRASTRUCTURE AND DRAINAGE

This section describes infrastructure and drainage facilities at Ames Research Center.

A. Methodology

Information presented in this report was gathered using a variety of means and sources as listed below:

- GIS maps of Ames Research Center facilities that show the existing potable water, sanitary sewer, storm drain, electrical and gas systems, compiled by NASA staff.
- Schematic maps from utility providers.
- Various record drawings of Ames Research Center and surrounding areas.
- Aerial photographs and topographic maps of Ames Research Center and surrounding areas.
- San Francisco Public Utilities Commission documents
- Previous sewer and storm drain studies and reports, including sewer line videos.
- A thorough site review and limited field survey, performed by BKF, that included the establishment of invert elevations and pipe sizes for relevant manholes along storm drain and sewer lines.
- Meetings, interviews and telephone conversations with:
  - NASA staff
  - Utility companies (PG&E and San Francisco Water Department)
  - City of Sunnyvale staff
  - City of Mountain View staff
  - Sunnyvale Water Pollution Control Plant staff
  - Palo Alto Regional Water Quality Control Plant staff
- Caltrans and VTA as-built drawings

B. Existing Conditions

1. Water

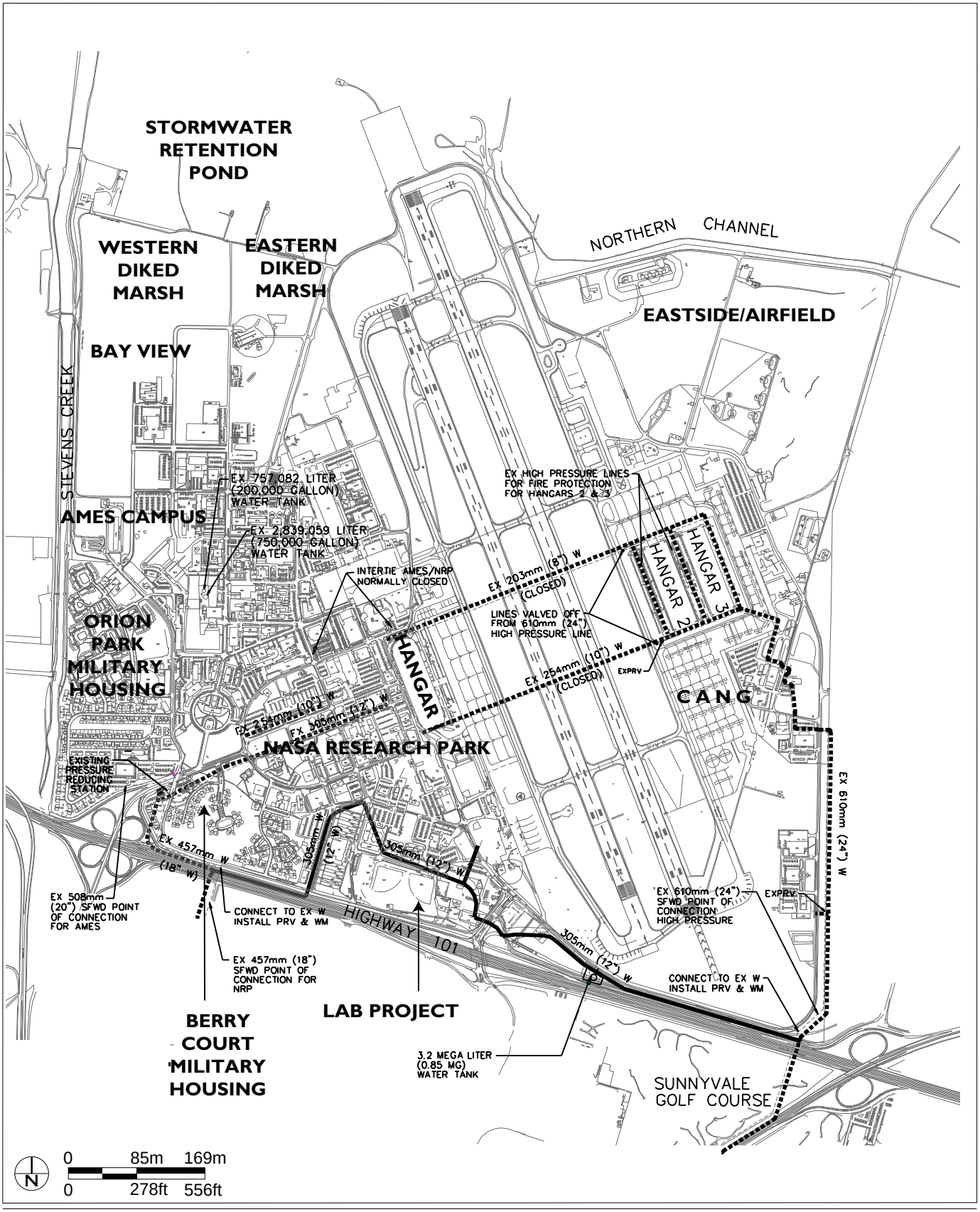
The following sections describe the existing water supply systems in the four planning areas, as shown in Figure 3.5-1.

a. Overview of the Existing System

Ames Research Center receives its potable water and fire protection supply from the San Francisco Water Department (SFWD). Approximately 85 percent of this water comes from the SFWD's Hetch Hetchy Reservoir, and about 15 percent from East Bay Municipal Utility District sources. The SFWD has indicated that the Hetch Hetchy aquaduct has sufficient capacity to serve any development that could be expected at Ames Research Center. The SFWD supply is chlorinated in Tracy, but is otherwise untreated prior to its delivery to South Peninsula water users. At Ames Research Center, water that is used in steam boilers undergoes additional softening.

NASA owns and operates the entire potable water system at Ames Research Center. The original freshwater distribution system was installed in 1932 using cast iron pipe ranging in size from 152 mm (6-inch) to 203 mm (8-inch). The overall condition of the old cast iron system is fair, requiring only routine maintenance. However, a large portion of the system has deteriorated to the point that it must be operated at a lower pressure to reduce the occurrence of leaks and other malfunctions. Some sections have needed repair in recent years, and the most problematic water lines and gate valves have been replaced.

As the distribution system has been repaired through the years, some lines have been replaced by asbestos-cement, ductile iron or plastic pipe. The present distribution system consists of over 37,000 meters (120,000 linear feet) of water line. Although most of the system is well laid out with adequate internal looping, the pipes are generally undersized and cannot provide adequate flow to meet public fire protection criteria.



Source: BKF

Existing Water Mains

Baseline Water Mains

Baseline Water Tank

FIGURE 3.5-1

BASELINE CONDITIONS WATER SYSTEM

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

NASA contracts directly with SFWD for the purchase of water. The current annual water demand at Ames Research Center, which is roughly 901 mega-liters (238 million gallons), is substantially less than when the base was fully occupied by Navy personnel living in the dormitories. There is no formal allocation of water from SFWD to Ames Research Center.

In January of 2001, the San Francisco Public Utilities Commission (SFPUC), which is responsible for the Hetch Hetchy water supply system, completed a Regional System Overview and Reliability Response as part of their Facilities Reliability Program. The study simulated overall SFPUC water system reliability in the event of a major earthquake on the San Andreas, Hayward, Calaveras or Great Valley Faults. The study estimates SFPUC regional water supplies would be unavailable within hours of the event to most system customers around the Bay, on the Peninsula and in San Francisco, and that service might not be restored for twenty to thirty days or longer. Until SFPUC water service is restored, most system customers, including Ames Research Center, would need to rely on local sources for fire fighting, drinking and sanitation. Full service restoration to meet average daily water demands would require an estimated six months to complete, or longer if labor, materials and equipment were difficult to obtain. The report recommends that storage facilities be able to withstand seismic trauma.

Generally accepted design practices call for storage to provide three days of domestic water use and flow to fight the design fire. For the baseline conditions at Ames Research Center, this equates to roughly 11.4 million liters (3 million gallons) of storage, which could be distributed anywhere on the site. Current existing storage is limited to 3.6 million liters (950,000 gallons), most of which is for the foam fire system used to protect Buildings N-211 and N-248 in the Ames Campus.

b. NRP Area

The primary water supply to Ames Research Center comes into the NRP Area from an SFWD meter at Tyrella Street. SFWD provides service to a 460 mm (18-inch) diameter branch from a multiple-metered vault served by a 4600 mm

(180-inch) diameter aqueduct. Pressure is reduced from 830 kilopascals(kPa) (120 pounds per square inch (psi)) to 310 kPa (45 psi) at the main meter vault for distribution. Flow is metered through two 150 mm (6-inch) meters that have a total capacity of up to 19,000 liters per minute (5,000 gallons per minute(gpm)).

The water distribution system in the NRP area is in worse condition than that of the remainder of Ames Research Center. To minimize leaks and localized failures in the system, the operating pressure within the NASA Research Park has been reduced to 45 psi. For this reason, inter-ties to other areas of Ames Research Center have been closed off, as discussed in more detail below. On-going maintenance and repair has kept the NASA Research Park system operational and eliminated the most serious deficiencies. Within the past 4 years, the main line that runs along South Akron Road was replaced with 300 mm (12-inch) ductile iron pipe. A parallel line located in North Akron Road was also replaced with a 250 mm (10-inch) PVC pipe. While this has increased the capacity of the system substantially, the operating pressure is still limited by the weaker portion of the system.

The NASA Research Park water system is connected to both the Ames Campus area and the Eastside/Airfield water systems. The Ames Campus water system connects to the NASA Research Park system by two 200 mm (8-inch) valves, located along Bushnell Street at McCord and Cummins Avenues. The valves are normally closed because of the difference in pressure between the two systems. The NASA Research Park system could be damaged due to the higher operating pressure of the ARC system.

The Eastside/Airfield water system connects to the NASA Research Park system by two lines that cross under the runway. They are 200 mm (8 inches) and 250 mm (10 inches) in diameter. The valves on these lines are located in the middle of the runway infield. The two valves are normally closed because of the large difference in pressure between the two systems. The NASA Research Park system would be damaged if the valves were opened due to the high operating pressure of the Eastside/Airfield system.

Fire flow is provided through the potable water distribution system. Hydrants are flushed annually and flow checks are performed every 5 years. Fire hydrants are also used periodically for irrigating landscaped areas. The fire capacity design for Ames Research Center is not based on the largest building size because the larger buildings have sprinkler systems. The fire marshal for Ames Research Center has set the minimum fire capacity for new systems at 5,700 liters per minute (1,500 gpm) at 140 kPa (20 psi) residual as required by the Uniform Fire Code. The most recent fire hydrant report (April 2000) shows a range of flows with many hydrants providing less than 3,800 liters per minute (1,000 gpm), with the lowest being less than 2,300 liters per minute (600 gpm).

A 740,000 liter (200,000-gallon) elevated tank is located within the NASA Research Park east of Shenandoah Plaza. The tank is old, unused and currently contains a small amount of stagnant water. There is some concern that this water could leak into the main system and contaminate the water. The tank could not be placed into service without removing the contaminated water and cleaning the tank. A pump station would have to be installed adjacent to the tank both to fill the tank and to boost the pressure of water drawn from the tank to supply the distribution system. Structural seismic retrofits would also be required.

The water supply for the Berry Court housing area is drawn from the NRP distribution system.

c. Ames Campus and Bay View Areas

The Ames Campus is serviced by a 510 mm (20-inch) asbestos cement pipe that runs parallel to the Highway 101 North on-ramp along Moffett Boulevard and feeds the Ames Campus area at 410 kPa (60 psi) to 450 kPa (65 psi). This main feed also serves Orion Park Military Housing and there are several interties between the two areas.

Fire flow is provided through the potable water distribution system, with a hydrant maintenance program similar to that employed in the NRP area. The

fire protection capacity of the Ames Campus is greater than that in the NRP area due to the higher operating pressure and better condition of the pipes. However, the area is fed from a single source with no open connections to the NRP area and Eastside/Airfield loops. The Ames Campus water system is connected to the NASA Research Park system by two 200 mm (8-inch) valves that are normally closed. These closed valves limit the redundancy of the fire protection system.

There are two storage tanks located near the ARC wind tunnels that have a combined capacity of approximately 3.6 mega-liters (950,000 gallons) of water. The larger tank (2.8 mega-liters (750,000 gallons)) is situated at grade and provides water for the foam fire protection system that is used for Buildings N-211 and N-248. The smaller tank (0.8 mega-liters (200,000 gallons)) is elevated and, according to NASA engineering personnel,[1] is currently only filled to partial capacity due to seismic concerns.

d. Eastside/Airfield

The Eastside/Airfield is serviced by a 610 mm (24-inch) feed from SFWD's 4,600 mm (180-inch) diameter aqueduct near the intersection of Highways 101 and 237, entering Ames Research Center east of the runway. The 610 mm (24-inch) line runs parallel to Macon Road. Pressure is not reduced from the 830 kPa (120 psi) operating pressure of the aqueduct and there are no pressure-reducing stations in the main loop within the Eastside/Airfield. The substantially higher water pressure in this area is required for fire protection for Hangars 2 and 3 east of the runways. The required fire flow for these hangars is 38,000 liters per minute (10,000 gpm).

The Eastside/Airfield distribution system contains lines ranging from 200 mm (8-inch) to 250 mm (10-inch) in diameter with several smaller diameter dead ends. The only significant looping in this system is found surrounding the hangars.

[1] John West, NASA, November 6, 2001.

The Eastside/Airfield water system is connected to the NASA Research Park system by one 200 mm (8-inch) line and one 250 mm (10-inch) line, as discussed above.

There is no water storage within the Eastside/Airfield.

2. Reclaimed Water

This section describes existing reclaimed water service at ARC and in the vicinity, as shown in Figure 3.5-2.

a. Overview of Existing System

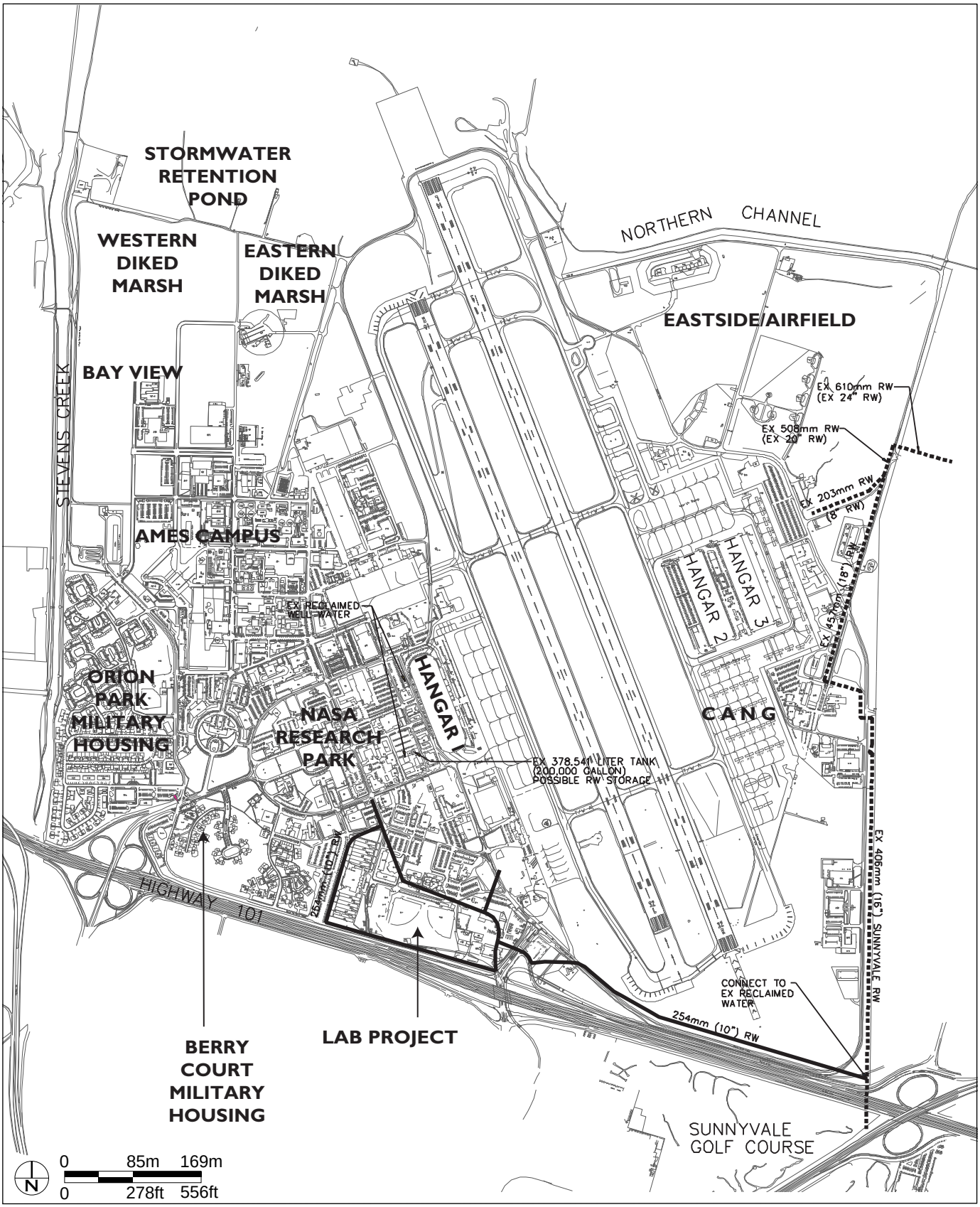
There are four potential sources of reclaimed water available at Ames Research Center. The Navy and MEW reclaimed water is collected and treated on-site as part of ongoing environmental remediation programs. The two neighboring municipalities also have existing or planned reclaimed water systems that could serve Ames Research Center.

b. Navy Reclaimed Water

The reclaimed water provided by the Navy is treated on-site as part of an ongoing environmental remediation program. It is extracted from an aquifer that is contaminated with TCE, PCE and fuel. The treated water meets current drinking water standards. It is planned to use this water for irrigation for the NRP to reduce domestic demand.

c. MEW Reclaimed Water

The MEW reclaimed water, so called because the source of the pollutants is bound by Middlefield Road, Ellis Street and Whisman Road just south of Highway 101, is collected and treated on-site as part of an ongoing environmental remediation program. It is collected from the same aquifer as the Navy reclaimed water but the plume from the MEW area is contaminated primarily with TCE. The treated water meets current drinking water standards. It is planned to use this water in wind tunnel cooling towers to reduce domestic demand.



Source: BKF

Existing Reclaimed Water Mains .....

Baseline Reclaimed Water Mains ——

FIGURE 3.5-2

BASELINE CONDITIONS
RECLAIMED WATER SYSTEM

d. Sunnyvale Reclaimed Water

The Eastside/Airfield is currently serviced by a 610 mm (24-inch) feed from Sunnyvale's reclaimed water system that enters Ames Research Center at the Lockheed Gate, just north of First Avenue. The line tees and is reduced to 510 mm (20 inches), which runs south along East Patrol Road. The main line is reduced again to 460 mm (18 inches) where a 200 mm (8-inch) service line tees off and extends toward the Airfield Substation (Building 591). The main line continues south and is reduced to 410 mm (16 inches) as it runs parallel to Macon Road. The main line leaves Ames Research Center at the southeast corner of the site, near the intersection of Highways 101 and 237. Reclaimed water is not used for irrigation at the Moffett Field Golf Course.

This water is suitable for use as irrigation water. The City of Sunnyvale has indicated that there may be adequate supply available to serve all of Ames Research Center with reclaimed water.

e. Mountain View Reclaimed Water

There is no existing source of reclaimed water available from the City of Mountain View at the current time. However, the City of Mountain View and Palo Alto Regional Water Quality Control Plant have applied for federal funding to construct a reclaimed water line between the treatment plant and Ames Research Center. The City of Mountain View is encouraging the use of reclaimed water for new projects within its service area. This source could be available to serve later phases of development at Ames Research Center.

f. Use of Reclaimed Water in Industrial Process

NASA has recently constructed an Industrial Wastewater Treatment Facility (IWWTF) to remove metals and TDS from industrial wastewater and treated groundwater. The effluent from the IWWTF will be used as makeup water in the boiler for the Arc Jet Facility, and in the Unitary Plan Wind Tunnel cooling tower.

On an annual basis, the IWWTF will provide 10.1 million gallons of makeup water to the Arc Jet boiler, reducing the use of potable water from the SFWD

by 10.1 million gallons. Treatment and reuse of this water also will result in a decrease in discharge to the Palo Alto Regional Water Quality Control Plant of 10.1 million gallons per year.

Normally, the Unitary Plan Wind Tunnel cooling tower is emptied three times per year. This results in another 1 million gallons per year, which will be treated in the IWWTF and reused in the Unitary Plan Wind Tunnel cooling tower, reducing potable water use from SFWD by 1 million gallons per year, and reducing discharge to the Palo Alto Regional Water Quality Control Plant by 1 million gallons per year.

An additional 3.3 million gallons per year of makeup water will be supplied to the Unitary Plan Wind Tunnel cooling tower from the IWWTF, further reducing the use of potable water from SFWD. The source of this water is treated groundwater from the Regional Plume from MEW and NASA extraction wells, which will then be further treated in the IWWTF to remove the total dissolved solids (TDS). Treatment and reuse of this water will also result in a decrease in discharge of Stevens Creek of 3.3 million gallons per year.

In summary, when fully operational, the IWWTF will result in a decrease in potable water use from SFWD of 14.4 million gallons per year, a decrease in discharge of industrial wastewater to the Palo Alto Regional Water Quality Control Plant of 11.1 million gallons per year and a decrease in discharge to Stevens Creek of 3.3 million gallons per year.

3. Sanitary Sewer

This section describes the existing sanitary sewer systems on the east and west sides of Ames Research Center, as shown in Figure 3.5-3.

a. Overview of the Existing System

The oldest sections of the sanitary sewer system were installed in the 1930's. The sanitary sewer infrastructure includes approximately 27,700 meters (90,900 feet) of collection lines in two separate systems.

The first system services the NRP area (including Shenandoah Plaza), the Eastside/Airfield, the California Air National Guard (CANG) area, the southern and eastern portions of the Ames Campus and the Berry Court Military Housing. This system discharges into the City of Sunnyvale sewer system and will be referred to as the eastern sanitary sewer system.

The second system services the Orion Park Military Housing, the remainder of the Ames Campus, and the Bay View area. This system discharges into the City of Mountain View sewer system and will be referred to as the western sanitary sewer system.

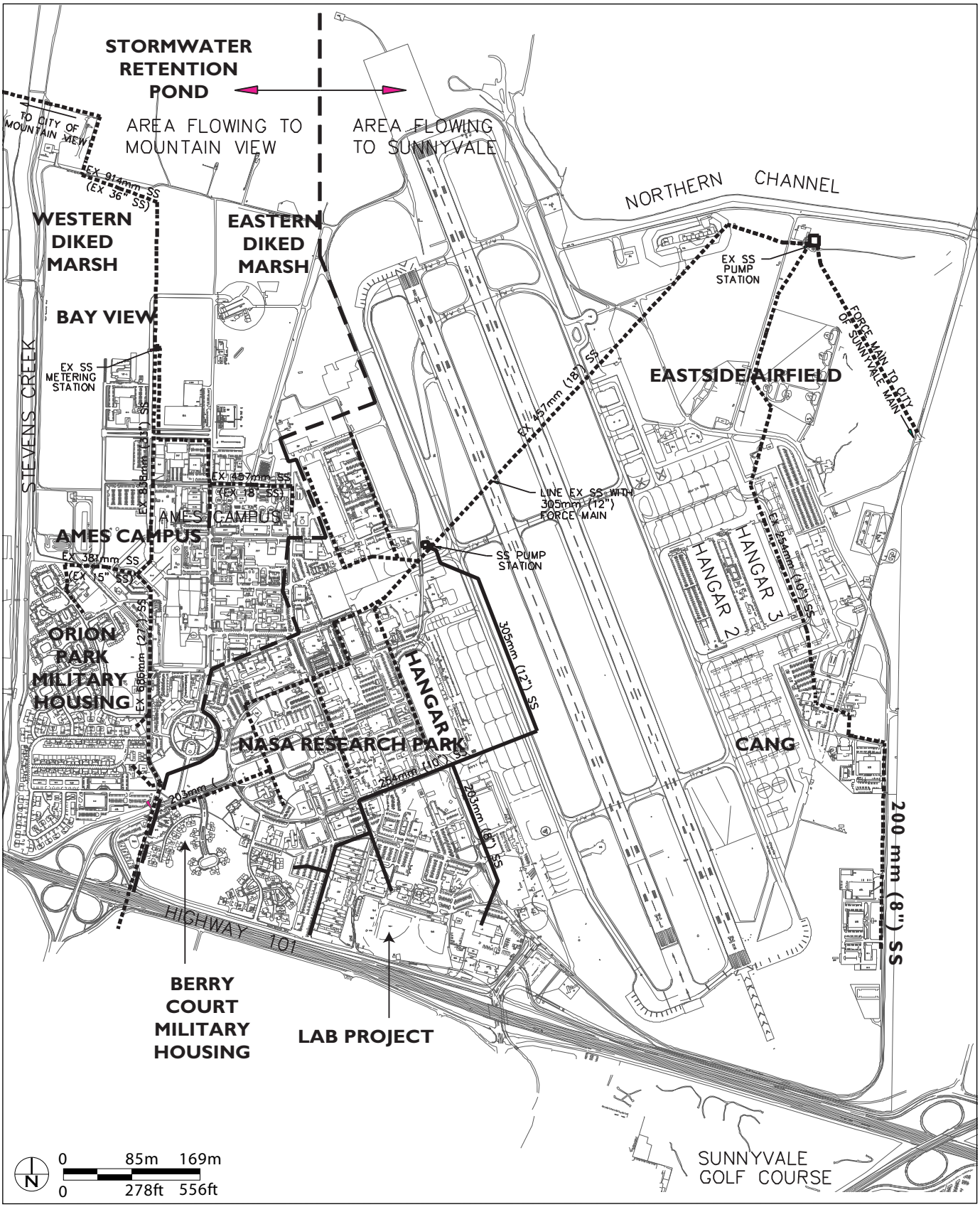
For both systems, the majority of the pipe is vitrified clay and is in need of either rehabilitation or replacement.

b. Eastern Sanitary Sewer System

The eastern sanitary sewer system's main trunk line extends from the southeastern portion of the Ames Campus area to the northeastern portion of the Eastside/Airfield. Collector lines from the NASA Research Park, Berry Court Military Housing, Shenandoah Plaza, and the southern and eastern portions of the Ames Campus feed into this major trunk line. The Eastside/Airfield and the CANG discharge directly into the existing pump station.

Starting at Berry Court Military Housing and the NASA Research Park, the eastern sewer system flows north, through Shenandoah Plaza, in three main lines toward the main trunk line. There are also several smaller sewer lines that flow south and east toward the main trunk line from the northern and eastern portion of the Ames Campus.

The main trunk line, which is a 460 mm (18-inch) pipe, flows northeast and crosses the existing airfield. This main line has the capacity to convey 7,600 liters per minute (2,000 gpm). The total existing peak wet weather flow through this line is estimated to be 4,160 liters per minute (1,100 gpm). After



Source: BKF

Existing Sanitary Sewer Mains .....

Baseline Sanitary Sewer Mains ———

Limits of Municipal Sewer Service Area — — —

FIGURE 3.5-3

BASELINE CONDITIONS SANITARY SEWER SYSTEM

review of a 1995 video log of the sewer pipe, it was determined that the line is in good condition. There are two manholes within the runway infield with 300 mm (12-inch) storm drain pipes through them. The storm drain pipes are sound and the potential for cross contamination appears to be minimal. The storm drain pipes restrict flow when the pipe is flowing more than one quarter full. However, this restriction is minor since the full-flow velocity is only about 0.61 meters per second (2 feet per second). The storm drainage pipes present more of a maintenance problem than a flow restriction as paper and solids could accumulate.

The main sewer line continues northeast until it reaches a pump station located in the northeastern portion of the Eastside/Airfield. The pump station, although still functional, is nearing the end of its useful life. In addition, the design is outdated, so it is expected that the pump station will eventually be completely replaced rather than refurbished. The pump station has a capacity of 7,600 liters per minute (2,000 gpm). Existing peak wet weather flow to the pump station is approximately 4,900 liters per minute (1,320 gpm). This station receives flow from the main line crossing the airfield and the Eastside/Airfield sewer system. From the pump station, sewage is pumped east through a 250 mm (10-inch) force main to an offsite gravity main that continues on to the Sunnyvale Water Pollution Control Plant (SWPCP), located about two miles to the east. The force main and gravity line that convey effluent from the pump station to the SWPCP are reported to be in good condition.

The SWPCP has capacity to treat 112 megaliters per day (29.5 million gallons per day, MGD). The SWPCP currently receives about 62.5 megaliters per day (16.5 MGD), and the City of Sunnyvale has no plans for expansion of the facility. Based on discussions with SWPCP staff, it is anticipated that the existing treatment facility would have sufficient capacity to support the proposed development of Ames Research Center.

NASA's contract with the SWPCP is based on effluent content. The Ames Campus is classified as a metal finisher, and is subject to local and federal

regulations governing heavy metal discharge. The Ames Campus has limited on-site capacity (about 270 liters (70 gallons) per day) in Building N-211 to treat effluent from the Alodine process (metal plating). SWPCP takes monthly samples at six Ames Campus sewer system manholes to monitor effluent content. Samples are tested for pH and heavy metals including cadmium, chromium, lead, arsenic, and selenium.

c. Western Sanitary Sewer System

The western sanitary sewer system's main trunk line enters the site just east of the Moffett Boulevard interchange as a 690 mm (27-inch) line running under Highway 101. The line extends from the freeway, through Ames Campus and the future Bay View area, to a location north of the North Perimeter Road, where it leaves the site. This gravity line is operated by the City of Mountain View and is referred to as the East Trunk in their documents. The line collects wastewater from an area south of Highway 101 before entering Ames Research Center and picks up domestic flow from Orion Park Military Housing, which is unmetered, and industrial flow from ARC, which is metered. North of Building N-255, the 690 mm (27-inch) East Trunk comes to a metering station, where the ARC flow enters. The collection system in ARC has lines ranging in diameter from 200 mm (8-inch) to 460 mm (18-inch). The metering station discharges to a 760 mm (30-inch) main. The pipe diameter increases to 910 mm (36-inch) as the pipe continues north and connects to the Mountain View sanitary sewer system.

The Mountain View East Trunk originally served a large industrial complex to the south of Highway 101, which discharged a high amount of sewage. Since then, recent high tech development has replaced the large industrial sites, resulting in a decrease in sewage flow at the point where the line enters Ames Research Center.

The East Trunk flows to a lift station located near the Mountain View Golf Course. The lift station is already at its 40 megaliters per day (10 MGD) capacity. Wet weather flows exceed the station capacity two or three times a year. When that occurs, the Supervisory Control and Data Acquisition

(SCADA) sensing system automatically shuts down the pumps and closes a slide gate into the lift station. This is referred to as Bypass Mode. Flow is then by gravity to the Palo Alto Regional Water Quality Control Plant. Mountain View is required to notify ARC when this occurs, as flow backs up into the East Trunk line at least as far as the metering station. Mountain View prepared a study of the lift station that recommends continuing to utilize Bypass Mode and expand the downstream piping rather than expand the station capacity.

The Mountain View sewer system conveys flow to the Palo Alto Regional Water Quality Control Plant. This treatment plant is jointly owned by the cities of Palo Alto, Mountain View and Los Altos. Mountain View currently has approximately 38 percent of ownership and capacity. The City of Palo Alto is responsible for administration of the Treatment Plant, whose capacity is approximately 144 megaliters per day (38 MGD) dry weather flow and 303 megaliters per day (80 MGD) peak wet weather flow. Current total peak wet weather flow into the plant is 227 megaliters per day (60 MGD). Mountain View's allocation of plant capacity is 55 megaliters per day (14.4 MGD) dry weather flow and 114 megaliters per day (30 MGD) peak wet weather flow. Currently, Mountain View uses approximately 37 megaliters per day (9.8 MGD) dry weather flow, and 83 megaliters per day (22 MGD) peak wet weather flow.

Ames Research Center has a permit with the Palo Alto Regional Water Quality Control Plant for wastewater treatment. The permit was signed in 1993 and renewed in 1999, and provides for treatment of up to 1.14 megaliters per day (0.3 MGD) peak flow. Current dry weather flow is on the order of 0.8 megaliters per day (0.2 MGD). Wet weather readings indicate a much higher peak flow than actually occurs due to the inundation of the flow meter during large rainfall events, as revealed by examination of the meter reading patterns. Interpretation of the meter readings leads to the conclusion that existing wet weather flow is almost 2.3 megaliters per day (0.6 MGD). The existing wet and dry weather flows are higher than those predicted by Mountain View's 1991 Sanitary Sewer Master Plan.

4. Storm Drainage

This section describes the existing storm drainage system in the two drainage areas within Ames Research Center, as shown in Figure 3.5-4.

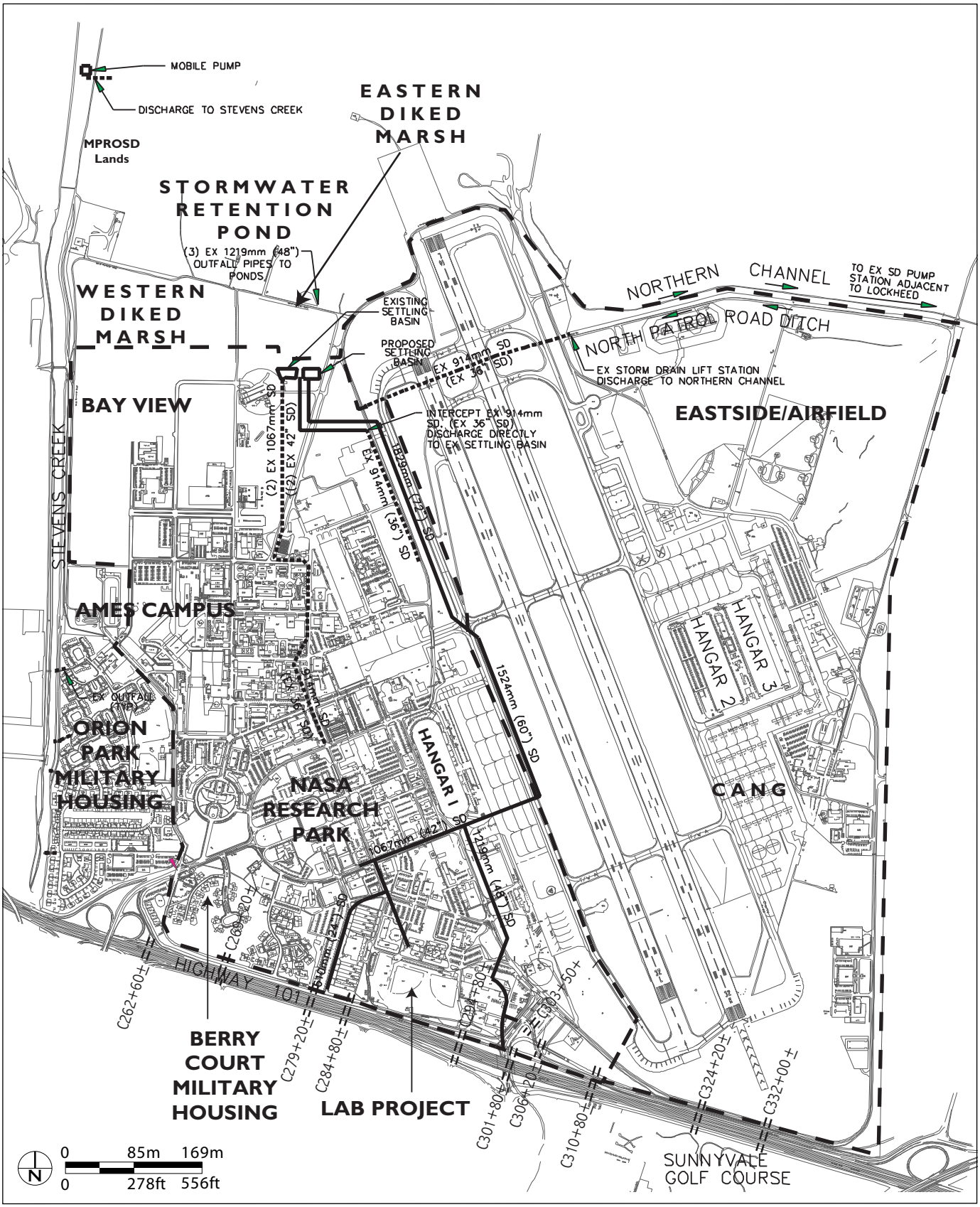
a. Overview of the Existing System

Ames Research Center watershed consists of about 680 hectares (1,690 acres) and is divided into two drainage areas. In addition, an area less than 20 hectares (50 acres), consisting primarily of Highway 101 right of way, discharges into ARC by means of several bubble-up drainage structures and culverts scattered along the southern boundary of ARC. The culvert piping ranges from 450 to 750 mm (12 to 18 inches) in diameter. There are two exposed culverts and eight bubble-ups, which include inlet/outlet structures resembling drainage inlets. On-site storm drain pipe sizes throughout ARC range from 150 mm (6-inch) to 1,070 mm (42-inch).

The first drainage area encompasses approximately 275 hectares (680 acres). The drainage system in this area services the NRP area, most of the Ames Campus, Berry Court Military Housing, and the Bay View area. This drainage system will be referred to as the western drainage system.

The western drainage system discharges into the Storm Water Retention Pond (SWRP) that lies in the north of the Bay View Area. The SWRP has no outfall and during most of the year, water is removed by evaporation only. During the wet season of some years, when flow into the SWRP exceeds the storage capacity, temporary pumps are moved onto the levee on the western edge of the SWRP where water is pumped directly into Stevens Creek. The western portion of the SWRP is owned by the Midpeninsula Regional Open Space District (MROSD).

In the past, Bay View and northern ARC have experienced general flooding due to a combination of inadequate culvert pipe capacity and ground elevations that are low relative to the water level of the SWRP while the remainder of the western drainage area has experienced localized flooding due to inadequate



Source: BKF

Caltrans Culvert/Outlet Location

Existing Storm Drain Mains

Baseline Storm Drain Mains

Drainage Area Boundary

FIGURE 3.5-4

BASELINE CONDITIONS STORM DRAIN SYSTEM

system capacity. Over the past 20 years, several storm drain studies have been completed, all of which agree that major renovation and rehabilitation of the western drainage system should take place. Certain intermediate measures have been taken to protect specific buildings but significant improvements to the underground system have not been made.

The second drainage area encompasses approximately 410 hectares (1,010 acres) in the southeast portion of the NRP area, the Ames Campus facilities next to the runway, the Eastside/Airfield, and the California Air National Guard area. This drainage system will be referred to as the eastern drainage system. There is no direct connection between this area and the SWRP. Local flooding occurs in the northern part of the airfield during peak rainfall events due to lack of adequate drainage capacity.

b. Western Drainage System

The western drainage system begins in the Berry Court Military Housing and NRP area. Eight drainage structures, which serve approximately 14 hectares (35 acres) of Caltrans right-of-way, discharge into the area that is drained by the western drainage system. Stormwater flows north, through Berry Court Military Housing, the NRP area and Shenandoah Plaza, toward the main junction, which is located on the boundary between Shenandoah Plaza and the Ames Campus at the intersection of McCord Avenue and Bushnell Road. Stormwater from a small portion of Orion Park Military Housing flows east toward the same junction. This line passes through Orion Park Military Housing, the Main Gate area and the Ames Campus area.

At the McCord/Bushnell junction, all lines discharge into a 910 mm (36-inch) main trunk line. Stormwater then flows north through the Ames Campus area. Several other storm drain lines, located in the Ames Campus area, discharge into this main line as it flows north.

At the border of the Ames Campus area and the Bay View area, the 910 mm (36-inch) main line discharges into two 1,0 70 mm (42-inch) pipes. These pipes flow north, through the Bay View area, toward a settling basin located in the

northeastern portion of Bay View. From the settling basin, stormwater is discharged into the Eastern Diked Marsh, located just north of Bay View. The stormwater is drained by three 1,220 mm (48-inch) culverts under North Perimeter Road. These culverts convey flows from the Eastern Diked Marsh to the SWRP.

The water in the SWRP has no outlet except evaporation. Therefore, when inflow into the SWRP is expected to exceed storage capacity, mobile pumps are used to discharge excess water into Stevens Creek, which flows from south to north along the western edge of Ames Research Center. The pumps are not automated and are brought out to the SWRP during flooding or when conditions are favorable for flooding. During the wet season, once the storage capacity of the SWRP is fully utilized any runoff discharging into the SWRP that exceeds the rate at which the mobile pumps can remove water from the SWRP will result in water backing up causing inundation of the wetlands in northern ARC and localized flooding in Bay View. The capacity of the mobile pumps is less than 0.30 cubic meters per second (10 cfs), which is much less than the peak runoff of 6.2 cubic meters per second (220 cfs) from the 2-year storm for the 275-hectare (680-acre) area that currently discharges into the SWRP.

In the past, localized flooding in the Ames Campus area has been caused by inadequate inlet/pipe capacity. This occurs because the Ames Campus drainage system has not been improved as the Ames Campus has expanded. During a more intense storm, the inlets do not allow enough water to enter the system, thus causing surface flooding. At the same time, the water that does enter into the system exceeds the capacity of the pipes, due to the fact that the pipe capacity is limited to a 2-year storm, and the pipes surcharge. When this occurs, even less surface water enters the system, which increases the degree of flooding.

c. Eastern Drainage System

The eastern drainage system begins in the southern portion of ARC and the southern portion of the CANG. Two drainage structures, which serve approximately 6 hectares (15 acres) of Caltrans right-of-way, discharge into the

southern portion of the airfield. Storm water from the airfield and the CANG travels north through several storm drain lines and via random overland flow. Overland flow from the northeastern portion of the airfield (currently occupied by the golf course) is collected by a small concrete-lined channel that flows west toward the Moffett Field storm drain lift station, which is located at the northeast corner of the airfield. This channel is commonly referred to as North Patrol Road Ditch. It is separated from the Northern Channel, which flows east, by a levee. The levee was recently raised to prevent flow in the Northern Channel (downstream of the lift station) from discharging into the smaller channel and flowing back into the lift station.

The southeastern portion of the NRP also contributes to the eastern drainage system via a main line that flows north, near the western most portion of the airfield. As this line continues north along Zook Road, it picks up several smaller lines from the eastern portion of ARC. Just south of North Warehouse Road, the line reaches its ultimate size of 910 mm (36-inch) in diameter. This provides a flow capacity of about 1.1 cubic meters per second (40 cfs) which would allow it to convey runoff from an 11-hectare (26-acre) drainage area during a 25-year storm event with no surface ponding. It is currently draining a much larger area and localized flooding has resulted. The 910 mm (36-inch) main line turns east, crossing the airfield, to the Moffett Field storm drain lift station, which is located at the northeastern section of the airfield.

Stormwater from the 910 mm (36-inch) main and the North Patrol Road Ditch, along with shallow groundwater, discharge into the lift station. The lift station consists of two 15kW (20 horsepower) pumps and has a capacity of approximately 45,000 liters per minute (12,000 gpm). Water is pumped into the Northern Channel, which flows east off of the site and runs along the northern boundary of the Lockheed site. Two 19,000 liters per minute (5,000 gpm) portable pumps are located at intermediate points along North Patrol Road Ditch and discharge directly into the Northern Channel. Therefore, the total peak discharge into the Northern Channel as it leaves the site is 83,000 liters per minute (22,000 gpm) or 1.40 cubic meters per second (49 cubic feet per second, cfs). The Northern Channel connects to the easternmost Lockheed

pond, adjacent to the Moffett Channel (Sunnyvale West Side Channel), through a 1,220 mm (48-inch) diameter culvert. A pump station with three pumps lifts the water into the Moffett Channel where it flows by gravity into San Francisco Bay. This pump station serves another 267 hectares (660 acres) of land east of Ames Research Center and has a total capacity of 117,000 liters per minute (31,000 gpm) or 1.95 cubic meters per second (69 cfs).

5. Electrical Service

This section describes the existing electricity distribution system in the four planning areas, as shown in Figure 3.5-5.

a. Overview of the Existing System, Including Substations

Ames Research Center receives electrical power from the United States Department of Energy, Western Area Power Administration (WAPA). If WAPA's allocated power is exceeded, NASA buys the balance from Pacific Gas & Electric (PG&E). WAPA provides electrical power to governmental agencies and municipalities.

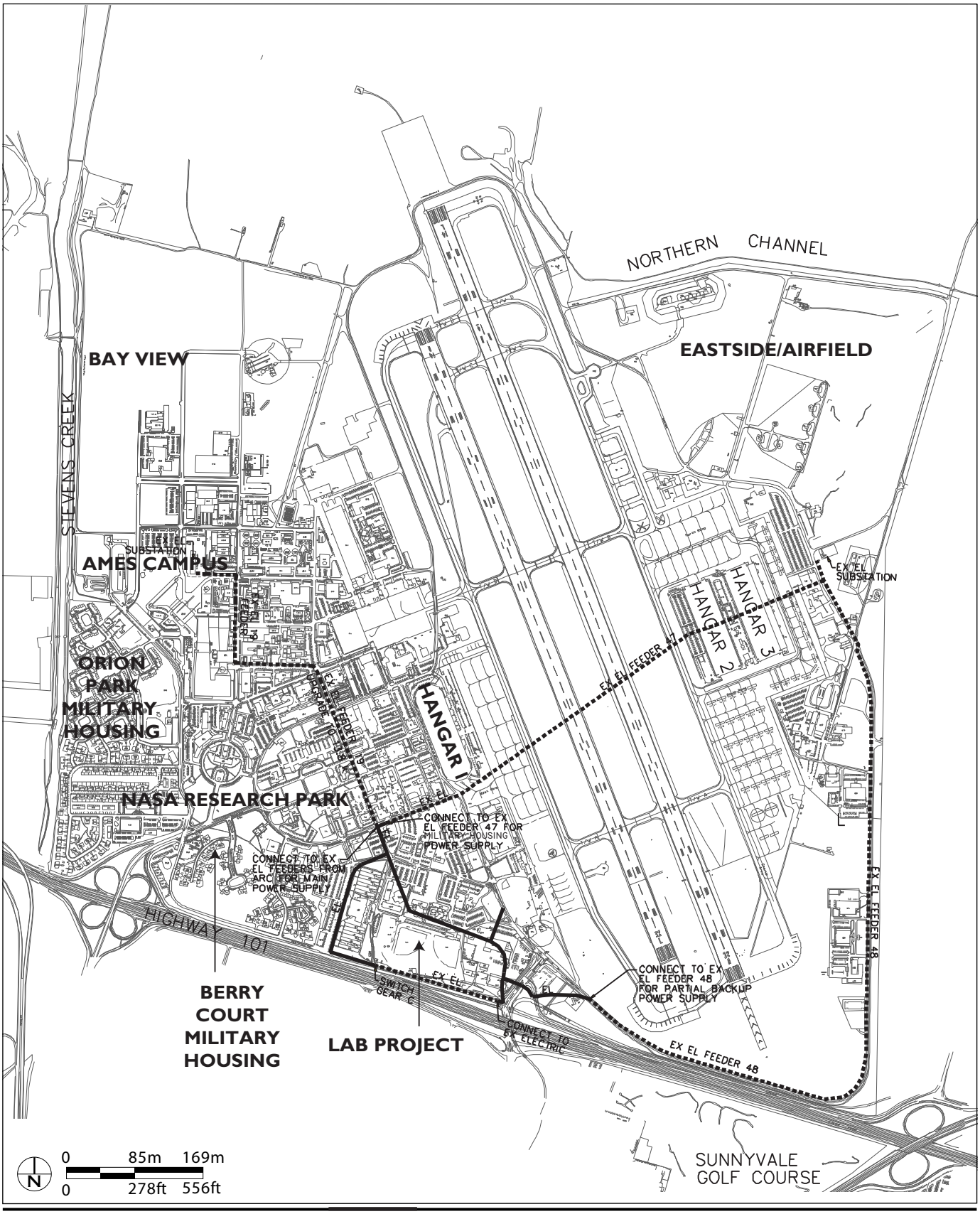
Ames Research Center is served by two electrical substations. The ARC substation was constructed in the 1940's and is centrally located in the Ames Campus area. It receives power from two PG&E 115kV overhead transmission lines that are dedicated exclusively to ARC, terminating at bus structures A and B. The bus structures serve as the main distribution point to 17 outdoor transformers that step-down from 115kV to various secondary voltages (13.8kV to ARC, 12kV feeder to the NRP area, and 6.9kV and other special voltages specific to lab testing). The 17 outdoor substation-type transformers have a total rating capacity of approximately 650 MVA. Of this total, 600 MVA (92 percent) are substation-type transformers dedicated only to serve specific lab buildings and their large motor loads. The remaining 50 MVA is used to provide typical electrical service (lighting, HVAC, receptacles and miscellaneous loads) to the buildings located throughout the Ames Campus.

In accordance with the contract with WAPA, the maximum rate of delivery to the ARC substation is 80 MW at a power factor of 0.95 or better. Full

utilization of the existing buildings served by the ARC substation would create a demand of nearly 36 MW for general (non-lab) applications. However, reduced occupancy of the existing buildings has dropped the demand to about 20 MW.

In addition to serving the Ames Campus, the ARC substation currently provides emergency backup 12kV power to the switchgear located in the NRP area (designated Switchgear C) via Feeder 19 (estimated capacity 6.5MVA), which runs through Shenandoah Plaza along McCord Avenue.

The second electrical substation was constructed in the early 1980's and is located in the Eastside/Airfield, northeast of the hangars. This substation was originally dedicated to serve the Naval Air Station, which included the airfield, the NRP area (including the Shenandoah Plaza Historic District), and Military Housing to the south and to the west of ARC. It receives power from a single PG&E 115kV overhead transmission line that also provides power to the Lockheed property to the east. The 115kV line terminates at a 115-12kV substation at a dead-end structure and one 115kV oil circuit breaker that serves two step-down transformers, each rated at 7.5/9.9 MVA. The secondary side (12kV) of both transformers terminates to a main breaker rated at 15kV, 500MVA, 1200 Amperes. The two mains, one tie and seven feeder breakers are housed in an outdoor walk-in enclosure which is designated Switchgear A. The substation and its related equipment appear to be in good condition. The total transformer capacity is approximately 20 MVA. In accordance with the contract with WAPA, the maximum rate of delivery to the Eastside/Airfield substation is 5,009 kW at a power factor of 1.0, which translates to 5.01 MVA. Full utilization of the existing buildings served by the Airfield substation could create a demand of up to 5 MW. Current existing demand is about 3.5 MW.



Source: BKF

Existing Electric Service Feeders .....

Baseline Electric Service Feeders ———

FIGURE 3.5-5

BASELINE CONDITIONS ELECTRIC SYSTEM

In addition to serving the Eastside/Airfield, this substation provides power to Switchgear C through Feeder 47 (estimated capacity 6.7MVA), which crosses the runways near the hangars, and Feeder 48 (estimated capacity 5.2MVA), which runs south from the substation along Macon Road, around the southern end of the runways, and west to Switchgear C. Should maintenance be necessary on any of the 115kV equipment, all facilities served by this substation would experience a forced power outage so that required repair work can be done.

b. NRP Area

As described above, there are three major 12kV incoming feeders that serve Switchgear C, which is located in the NRP area at the northwest corner of the intersection of Bailey Road and South Perimeter Road. Due to the feeder sizes, the operation will require both Feeders 47 and 48 to be energized at Switchgear C in order to provide a total of 11.2 MVA of load capacity. Feeder 19 is a backup and can only provide power to Switchgear C if the other two feeders' circuit breakers are locked-out and in the open position. Switchgear C was installed in the mid 1980's and is in relatively good condition.

The existing underground electrical distribution system in the NRP area is a mixture of terra cotta (maximum size 89 mm (3.5-inch)), transite and PVC conduits (127 mm (5-inch) for recent construction, with the majority at 100 mm (4-inch)). Upgrading to a larger cable size in existing conduits is limited to the existing diameter size of the conduit. From a safety standpoint, many of the manholes are overcrowded with cables and too small to accommodate the existing cabling system. The 12kV system is incompatible with the 13.8kV system in ARC.

Switchgear C provides power to the Military Housing areas, the runway lighting, and an antiquated low-voltage system that serve about 25 buildings within the NRP area. Voltage for this system is stepped down from 12 to 2.4kV at Switchgear E located at the corner of Wescoat Road and McCord Avenue. NASA has recently completed a construction project that installed eleven 15kV pad-mounted distribution switches throughout the site. These

distribution switches will be the points of connection for the existing building transformers, when the conversion from 2.4kV is made.

Many of the 2.4kV system feeders were installed utilizing paper-insulated lead cables, which are still in the underground ductbank system. Lead is considered to be a hazardous waste material and hence disposal must be in accordance with EPA regulations. Most of the transformers, switchgears, cables and related components for the 2.4kV system are reaching or have exceeded their life expectancy. In some cases, oil fuse cutouts/switches and cable-link boxes are still in service and are considered a safety hazard by today's standards. It has long been the intention of the Navy and NASA to phase out the 2.4kV system.

In general, performing any maintenance on the distribution feeders in the NRP area causes service to many buildings to be interrupted because all of the existing distribution feeders are radial-feed.

c. Ames Campus and Bay View Areas

The ARC substation is described above. The ARC substation equipment and distribution system is over 40 years old. Typical service life for medium and high voltage equipment is 20 to 30 years. It is expected that the maintenance cost for maintaining this electrical system will increase as each year goes by. The Electric Power Office (EPrO) was formed in the late 1990's in order to improve safety and prevent catastrophic failures of ARC's aging electrical infrastructure.

Recent improvements to the system include:

- Replacement of antiquated 115kV Oil Circuit Breakers.
- Repair of transformers T-45 and T-46.
- Power monitoring system has been replaced.
- A program of maintenance and regularly scheduled replacement has been instituted for the protective relaying system on high and medium voltage systems. Almost all of the 115kV protective relays have been replaced

with modern microprocessor components with the remainder of the systems to be replaced as needed.

- Replacement of transformer T44.

Additional planned improvements include:

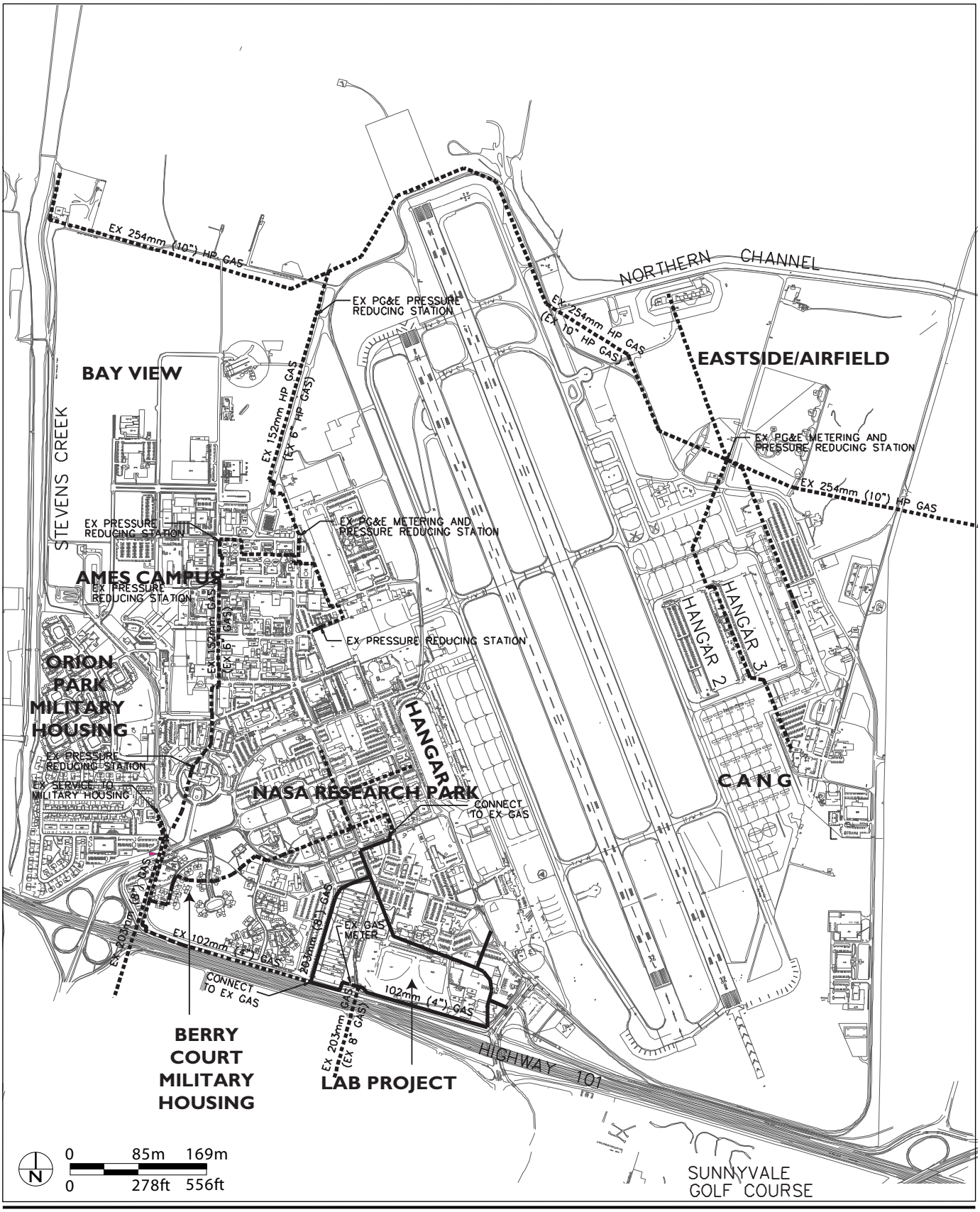
- Recently retrofitted 15kV class Air Circuit Breakers (SF6) are scheduled to be replaced.
- Replace 70 percent of lead cable.
- Replace building service transformers, primary switchgear and secondary switchboards.
- Replace all underground distribution switches in manholes with above ground distribution switches.
- Convert the 7.2kV distribution system to 13.8kV.

Once these improvements are complete, the only major remaining deficiency will be the undersized and deteriorated underground ductbank system.

The distribution for the Ames Campus area operates at 13.8kV and 7.2kV, and consists of an underground ductbank system that is made up of cables, conduits and manhole vaults. There are distribution-type transformers located in or near buildings that step down the distribution voltage to utilization level (480/277 Volts, 208/120 Volts). There are more than 100 distribution transformers located throughout the site of various kVA rating and types (oil, dry).

d. Eastside/Airfield

The substation located in the Eastside/Airfield area is described above. The distribution for the Eastside/Airfield operates primarily at 12kV with some vestigial 2.4kV portions. Switchgears B and D are located on Feeder 47 near the hangars and provide power to the buildings in this area. A 12kV distribution system extends southward, eventually running parallel to Feeder



Source: BKF

Existing Gas Mains ----------

Baseline Gas Mains ——————

FIGURE 3.5-6

BASELINE CONDITIONS GAS SYSTEM

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

48 along Macon Road, providing power to the California Air National Guard facilities.

6. Natural Gas Service

This section describes the natural gas delivery system in each of the four planning areas, as shown in Figure 3.5-6.

a. Overview of the Existing System

Ames Research Center's natural gas supply is purchased from the Defense Energy Support Center (DESC) and transmitted to the site by Pacific Gas and Electric (PG&E) through two main service lines. The first is a 250 mm (10-inch) high pressure (2,070 kPa (300 psig)) east-west line that branches off to a 150 mm (6-inch) north-south line that is lower in pressure, but at 970 kPa (140 psig) is still considered high pressure. The 250 mm (10-inch) line enters into Ames Research Center north of the Bay View area and extends east, around the north portion of the Eastside/Airfield, through the golf course and out of Ames Research Center. The north-south line branches off of the 2,070 kPa (300 psig) line and extends south to a PG&E-owned pressure-reducing station, located near the intersection of Lindbergh Avenue and North Perimeter Road. At this station, pressure is reduced from 2,070 kPa (300 psig) to 970 kPa (140 psig). The line continues south, through the Bay View area, to a PG&E pressure-reducing and metering station located in the Ames Campus, and continues into the Berry Court Military Housing area and out of Ames Research Center under Highway 101. This line services the Ames Campus.

The second service line enters Ames Research Center in a separate crossing under Highway 101. The metering station (G27) for this service is located at the northwest corner of Bailey Road and South Perimeter Road and it serves the NRP area and Berry Court Military Housing.

Another line crosses under Highway 101 and onto Front Street. It serves Orion Park Military Housing, which is not part of Ames Research Center. Berry Court Military Housing is tied to the NASA Research Park natural gas system. Although both Berry Court Military Housing and Orion Park

Military Housing are mentioned, they are outside the scope of this section except as they impact Ames Research Center utility systems.

There are several metering stations throughout the site that monitor specific areas. The gas flow through each of the metering systems varies, depending upon the demand of the area served. Ames Research Center purchases natural gas directly from the producers via the Defense Energy Support Center and a transmission fee is paid to PG&E to transport the natural gas from the producers to Ames Research Center.

b. NRP Area

The NRP area is supplied natural gas through a 100 mm (4-inch) steel pipe. The capacity of this service connection is roughly 150,000 cubic meters per hour (5.3 million cubic feet per hour) provided that adequate supply is available. The gas piping branches off to a different distribution network to supply natural gas to various buildings. The incoming nominal pressure to the metering station, located at Bailey Road and South Perimeter Road, is 450 kPa (65 psig) and is then reduced down to 117 kPa (17 psig) nominal pressure at the downstream portion of the metering station. The natural gas distribution system is considered a medium pressure system.

The NRP area's natural gas distribution system appears to be in fair condition. Some of the existing steel pipes have been replaced with polyethylene pipes due to corrosion and gas leakage problems. Most of the steel pipe replacements took place west of Bailey Road. Pipe corrosion occurred due to aging pipelines and a high water table in the area. Some of the gas valves were inoperable and had to be replaced throughout the area due to leakage, with other valves scheduled to be replaced in the future.

The main natural gas meters appear to be in good condition. Various buildings have sub-meters, which appear to be in good condition. Other buildings, throughout the site, have pressure regulators without gas meters on the supply piping.

The primary use of the natural gas is for space heating in offices, housing, barracks, shops and training centers. Additional gas consumers include cooking equipment, water heaters and a boiler plant.

c. Ames Campus and Bay View Areas

The main PG&E piping is considered a high-pressure natural gas piping system. The capacity of this line is roughly 552,000 cubic meters per hour (19.5 million cubic feet per hour) provided that adequate supply is available. PG&E has a pressure-reducing station near the intersection of Lindbergh Avenue and North Perimeter Road where the pressure is reduced from 2,070 kPa (300 psig) to 970 kPa (140 psig) nominal pressure. ARC's main pressure reducing station, located at the intersection of Mark Avenue and Hunsaker Avenue, reduces the gas pressure from 970 kPa (140 psig) to 410 kPa (60 psig) nominal pressure. The incoming nominal pressure to the metering station is 410 kPa (60 psig) and is further reduced to 140 kPa (20 psig) nominal pressure at the downstream portion of the metering station. ARC's natural gas distribution system is considered a medium pressure system. Several other pressure-reducing stations regulate the pressure down further to operating pressures in the range of 48 kPa (7 psig) to 100 kPa (15 psig).

The Ames Campus area is supplied natural gas through a 200 mm (8-inch) steel pipe, which is reduced to 150 mm (6-inch) and 100 mm (4-inch) steel piping loops throughout the area. The natural gas distribution system in ARC appears to be in fair condition. Ongoing maintenance has kept the system in good working order. Some of the existing steel pipes have been replaced with polyethylene pipes due to corrosion and gas leakage. Some of the gas valves have also been removed and replaced. In addition, some of the pipes were abandoned and rerouted.

The primary use of natural gas is for heating offices and research facilities, domestic water heaters, and a boiler plant in one of the research facilities.

d. Eastside/Airfield

The Eastside/Airfield is supplied natural gas through a 250 mm (10-inch) PG&E trunk line, which is located at the north end of the airfield. The pressure in this line is 2,070 kPa (300 psig). A line extends off of the main line to a pressure reducing station where the pressure is reduced from 2,070 kPa (300 psig) to 970 kPa (140 psig). The capacity of this line is roughly 221,000 cubic meters (7.8 million cubic feet) per hour provided that adequate supply is available. After metering, the pressure is further reduced from 970 kPa (140 psig) to 410 kPa (60 psig). Several other pressure-reducing stations regulate the pressure down further to operating pressures in the range of 48 kPa (7 psig) to 100 kPa (15 psig).

The primary use of natural gas is for heating domestic water and for space heating in buildings.

C. Future Baseline Conditions

Under baseline conditions, new development will occur at ARC under both the CUP and CANG EA's. This section describes new infrastructure that will be built as part of the approved CUP projects.

1. Water

Baseline development in the NRP area will occur in areas that require rebuilding the existing water distribution piping. In addition, the water distribution system in NRP is in poor condition and is operating at a lower pressure than that required for the baseline development. For this reason, a new connection to the existing 460 mm (18-inch) diameter line at Tyrella Street will be installed. New water distribution piping that follows the baseline street layout will also be installed and sized to provide adequate capacity for baseline development. New connections to the existing water distribution piping will be provided, along with pressure regulating valves to accommodate pressure differentials. A 305 mm (12-inch) main south of the airfield will connect to the existing 610 mm (24-inch) water line at the southeast corner of Ames Research

Center to provide a looped system. Because domestic water demands are significantly less than the demands for fire protection, flow rate for fire fighting will be used to design the distribution piping system.

Emergency water supply is required to provide fire flow for the duration of the fire plus operational storage. Fire demand in each development area is 11,000 liters per minute (3,000 gpm) for 4 hours. This assumes that all new and renovated buildings will be equipped with a fire sprinkler system; if no sprinkler systems were installed, the demand would be greater. A 3.2 million liter (850,000-gallon) storage tank with a pump distribution system will be installed as an emergency water supply in the NRP area.

Because of the use of reclaimed water for irrigation and the utilization of low flow plumbing fixtures, potable water demand will decrease with the baseline development. The annual potable water demand will decrease by 29 million liters (7.7 million gallons) and the peak potable domestic (non-fire) water demand will decrease by 380 liters per minute (100 gpm).

2. Reclaimed Water

Under baseline conditions, a new connection to the existing 410 mm (16-inch) diameter reclaimed water line at the southeast corner of Ames Research Center will be installed and a 250 mm (10-inch) main extended into the NRP. New reclaimed water distribution piping that follows the baseline street layout will be installed in the new development.

3. Sanitary Sewer

New sewer collection piping will be installed following the proposed street layout for new development in the NRP area. A main will be installed in Wescoat Road to intercept the flow and direct it east toward the airfield past the West Parallel, then north in the utility corridor along the western edge of the airfield. This line will terminate at the proposed sewer pump station located northeast of Hangar 1. The pump station will discharge into the existing 460 mm (18-inch) gravity line that crosses the airfield. This gravity line will be converted to a force main by lining the existing line from the new

pump station to the existing pump station located northeast of the airfield. The installation of the force main addresses several issues. The first is the interception of the 460 mm (18-inch) line by the proposed storm main running north from the NRP area to the SWRP. The second is the presence of storm drain pipes in two of the manholes in the 460 mm (18-inch) line. A force main could be directed under these three obstructions. Installing a force main will also eliminate the potential for both I/I in this line and the deposition of solids in the line during low flows, which can be a maintenance problem.

The baseline development will not increase sewer discharge due to the reduction in I/I from the installation of new piping.

4. Storm Drainage

Under baseline conditions, new development located at the southern end of the NRP will create conflicts with the existing storm water collection piping. A new storm drain system will be constructed to accommodate the new site layout. The quantity of storm runoff will not increase significantly as a result of the baseline development. However, the existing storm main that drains this area and runs north through the Ames Campus cannot accommodate the existing storm runoff. Therefore, a new system will be constructed that diverts storm water around the Ames Campus. With the new drainage system, run-off from the NRP will be intercepted prior to entering Shenandoah Plaza by a 1070 mm (42-inch) main located in Wescoat Road and directed east toward the airfield. The interceptor will extend east past the West Parallel in the airfield, and then run north along the western edge of the airfield, eventually discharging into a new settling basin adjacent to the existing settling basin north of Ames Campus. This alignment will avoid the crossing conflicts associated with any alignment through the Ames Campus area.

5. Electrical Service

Under baseline conditions, new development located at the southern end of the NRP area will create conflicts with the existing electrical distribution system, including the three feeders serving Switchgear C (Building 590) in the NRP area. The feeder from the ARC substation currently provides 12kV back-up

power to Switchgear C. Switchgear C in turn provides feeders back to Shenandoah Plaza and the Berry Court Military Housing area. Under baseline conditions, the feeder to Switchgear C will be relocated from the area where the laboratory project is being constructed. The feeders from the Airfield substation to Switchgear C will be upgraded to 13.8kV and will provide backup power to that switchgear. The baseline development will also require the installation of a new electrical distribution system to serve the new development and maintain service to existing buildings.

The baseline development will increase demand for electricity by 6.6 MW to a total demand of approximately 43.3 MW (without allowing for wind tunnel operations).

6. Natural Gas Service

Under baseline conditions, new development located at the southern end of the NRP will create conflicts with the existing natural gas distribution system and will require the installation of new piping.

The baseline development will increase demand for natural gas by 58,000 giga-joules (550,000 therms) per year to a total of 400 million giga-joules (4 million therms) per year.

D. Infrastructure Within City Boundaries

NASA Ames has historically installed, maintained, and improved its infrastructure in the portions of ARC that are within the City of Mountain View and the City of Sunnyvale boundaries. NASA plans to continue this in the future.

3.6 SERVICES

This section describes the fire, police, solid waste, and school services for Ames Research Center.

A. Fire

Fire protection services at Ames Research Center are currently provided by NASA through an agreement with the California Air National Guard (CANG). The department's personnel are located in an on-site building.

Ames Research Center is part of the Santa Clara County Fire Mutual Aid service, and thus has a cooperative response agreement with all of the city fire departments in Santa Clara County. Under this agreement, if an emergency situation occurred at Ames Research Center a dispatch would be sent out requesting aid. Because it is the closest to the base, the Mountain View Fire Department would be the first agency contacted. If Mountain View were busy, the CANG dispatcher would contact the City of Sunnyvale Fire Department, which is the next closest to Ames Research Center. In the unlikely event that Sunnyvale were busy as well, the CANG dispatcher would work his or her way down the list of cities until assistance was found. When a fire department responds to the Santa Clara County Fire Mutual Aid Agreement, the standard procedure is to provide two fire engines, one truck, and one Chief Officer. In the event of a serious emergency, the maximum amount of support available to NASA would be a total of 22 fire engines with four firefighters each, seven trucks, and seven Chief Officers. The only situation where NASA would be without support would be if an event occurred that affected all of the cities in Santa Clara County.[1]

[1] Joe Gippetti, Fire Marshal at NASA/Ames.

B. Police

Law enforcement at Ames Research Center is provided by the NASA/ARC Protective Services Office, Security Services Branch (JPS), which has the NASA Federal Law Enforcement Authority pursuant to the Space Act, 42 USC 2456 and 2456a. Under the baseline, the NRP area of Ames Research Center will be opened to the public. The remainder of the Center is closed to the public and is surrounded by a security fence with manned gates. Visitors must obtain authorization to enter Ames Research Center. [2]

C. Solid Waste

NASA contracts for solid waste disposal and recycling at Ames Research Center. The primary contractor for refuse disposal is Southbay Maintenance and the sub-contractor is Stevens Creek Disposal. Ames Research Center has no active landfill, so waste is taken to the Newby Island Landfill in Milpitas. This landfill receives an average of 817,000 tonnes (900,000 tons) of waste per year. Newby Island Landfill has a remaining capacity of 12 million cubic meters (16 million cubic yards) and is expected to reach capacity in 2020.[3]

In 2001, 5,171 tonnes (5,700 tons) of solid waste were generated at Ames Research Center.[4] Recycling programs have been implemented to help reduce off-site waste disposal at landfills by 50 percent at Ames Research Center. [5] In 2001, approximately 3,269 tonnes (3,604 tons) of the total solid waste generated at Ames were recycled on-site and off-site. This quantity includes

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[2] NASA Procedures and Guidelines - 1620.1

[3] Gil Cheso, BFI, Newby Island Landfill, personal communication, March 12, 2001.

[4] Plant Engineering Branch, NASA Ames Research Center, 2001.

[5] NASA Procedures and Guidelines - 8820.

approximately 2,385 tonnes (2,629 tons) of wastes from the Center's active green waste program through which all landscape debris is composted on-site. The remaining 884 tonnes (975 tons) of material included paper, cardboard, construction and demolition waste, scrap metal, tires, toner cartridges, and computers, all of which were recycled off-site.

Ames Research Center submitted a Pollution Prevention Plan in March of 2002 to NASA Headquarters that states Ames' commitment to achieving the Agency goal of a 35 percent diversion rate by 2010. Based on the data collected in 2001, Ames has already surpassed this goal. Ames' recycling of 3,269 tonnes (3,604 tons) of waste in 2001 represents a diversion rate of 63 percent.[6]

D. Schools

Currently, there is no permanent housing within Ames Research Center, and therefore no demand for school services. Children living in the Military Housing areas, located in areas of Moffett Field not under NASA control, attend elementary and middle schools in the Mountain View School District and high school in the Mountain View-Los Altos Union High School District.

Table 3.6-1 shows current enrollments at the schools that serve Moffett Field.

1. Mountain View-Whisman School District

The Mountain View-Whisman School District has a total of 14 public schools. Children from Moffett Field attend Landel, Monta Loma and Theuerkauf Elementary Schools and Graham and Crittenden Middle Schools. As of November 1999, 221 students from the Military Housing areas attended

[6] Diane Shelander, NASA Ames Research Center, personal communication, April 25, 2002.

TABLE 3.6-1 **ENROLLMENT AND CAPACITIES AT MOFFETT FIELD AREA SCHOOLS**

District/School	Enrollment	Capacity
Mountain View-Whisman School District		
Monta Loma Elementary	479	479
Theuerkauf Elementary	466	468
Landel Elementary	498	511
Crittenden Middle School	514	514
Graham Middle School	731	743
Mountain View-Los Altos High School District		
Mountain View High	1,449	1,400
Los Altos High	1,379	1,500

Sources: Mountain View-Whisman School District and Mountain View-Los Altos High School District, 2000 and 2001.

schools in the Mountain View School District.[7] All of the schools within the Mountain View-Whisman School District are either at capacity or slightly under capacity.[8] In Fall 2001, there was capacity for 23 additional students at the five schools in the District that serve Moffett Field children.

[7] Susan Spaye, Mountain View-Whisman School District, personal communication November 12, 1999. 2001 data were unavailable.

[8] Ted O, Mountain View-Whisman School District, personal communication November 13, 2001.

2. Mountain View-Los Altos Union High School District

Students from the Whisman School District and the Mountain View School District feed into the Mountain View-Los Altos Union High School District. In 1998, 21 students from the Military Housing areas attended High Schools in this District; 14 attended Mountain View High School and seven attended Los Altos High School.[9] As of October 2001, total enrollment at Mountain View High School was 1,449 students, slightly over the school's capacity of 1,400 students. In 2001, total enrollment at Los Altos High Schools was 1,379, approximately 92 percent of its capacity of 1,500 students.[10]

[9] Judi Lovell , Mountain View-Los Altos Union High School District, November 2, 1999.

[10] Sandy Zenker, Mountain View-Los Altos High School District, November 6, 2001.

3.7 HAZARDOUS MATERIALS, SITE CONTAMINATION AND POLLUTION PREVENTION

This section describes hazardous materials and site contamination at Ames Research Center. It is divided into three subsections. The first deals with the types and quantities of hazardous material and wastes found at Ames Research Center, and the safety and environmental procedures in place for handling them. The second describes the Regional Plume, a plume of contaminated groundwater that underlies approximately 130 hectares (320 acres) of Ames Research Center. The third describes sites contaminated by the Navy's pre-1994 use of Moffett Field, and NASA's use of the Ames Campus, as well as their remediation status.

A. Hazardous Materials and Wastes

Because Ames Research Center is home to a large number of research and development projects, many different hazardous substances are used there. At any given time, there may be more than 5,000 hazardous substances in the laboratories, shops, and other facilities within the Ames Campus area, producing a comparable number of types of hazardous waste. The quantities from laboratories are often small: ounces or grams of particular substances; quantities from shops and other operations may be greater than 55 gallons.[1]

A number of protocols are in place throughout Ames Research Center to control the hazards associated with hazardous substances and to minimize the risks of exposure or spills:

- The **Ames Environmental Procedures and Guidelines** ensure that the Center meets all federal, State, and local hazardous materials and hazardous waste regulations.
- The **Hazardous Waste Minimization Plan** prescribes actions that will reduce Ames Research Center's hazardous waste output.
- The **Spill Prevention Control and Countermeasures Plan** identifies response procedures for spills of contaminants, and includes assignment of

[1] *Draft Environmental Resources Document for the National Aeronautics and Space Administration Ames Research Center*, 2000.

containment and clean-up responsibilities among the departments at NASA, as well as site-specific contingency plans.

- The **Hazard Communication Plan** identifies sources of information on hazardous materials.[2]
- The **Radiation Safety Committee** supervises and monitors all activities at Ames Research Center that might involve radiation hazards.[3]
- The **Hazardous Substance Reporting Protocols** set procedures for reporting hazardous substances to outside regulatory agencies, which is done by the NASA Ames Environmental Services Office. Other personnel report hazardous substance inventory to the NASA Ames Environmental Services Office, and report hazardous substance spills to the NASA Ames Duty Office, which activates the spill response system.[4]
- The **Hazardous Waste Disposal Procedures** at Ames Research Center require that all hazardous wastes be transported to secure, ventilated packaging areas, from which they are packaged and transported to State- and federally-authorized treatment or disposal sites.[5]
- The **Radioactive Waste Disposal Procedures** require that all radioactive wastes be stored in a bunker near Building N-218. Approximately every three months, a licensed contractor removes the waste from the bunker and takes it to authorized disposal sites within the United States.[6] NASA

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[2] Ames Health and Safety Manual, APG 1700.1

[3] *Draft Environmental Resources Document for the National Aeronautics and Space Administration Ames Research Center*. 2000.

[4] As required by Santa Clara County.

[5] *Draft Environmental Resources Document for the National Aeronautics and Space Administration Ames Research Center*. 2000.

[6] *Draft Environmental Resources Document for the National Aeronautics and Space Administration Ames Research Center*. 2000.

is also authorized to hold radioactive material with a physical half-life of less than 120 days for decay-in-storage before disposal.

B. Pollution Prevention

Ames Research Center is in the process of implementing NASA's Environmental Excellence for the 21st-Century strategy, which includes a pollution prevention plan consistent with the requirements of relevant Federal and State regulations and laws.[7] ARC has reduced solid and hazardous waste production, minimized impacts to the environment, and controlled air emissions through a variety of methods and technologies. In addition, ARC has routinely implemented recycling and educational programs to reach the ARC community and bring environmental issues to the forefront. In accordance with Executive Orders 13101, 13148, 13149 and 13150, ARC's goal is to increase waste prevention, recycling, and the purchase and use of recycled content and environmentally preferable products and services.

The following are some of the pollution prevention programs and activities that are currently being implemented at ARC:

- **Composting and Soil Bioremediation**. All landscaping green waste is composted or made into mulch at Building N-267 for future landscaping use.
- **Recycling.** Some of the items ARC is currently recycling include white paper, mixed paper, cardboard, toner cartridges, various types of batteries, fluorescent lamps, certain solvents, waste oil, oil filters, scrap metal, tires, computers, construction and demolition waste, and empty drums. A

[7] NASA Procedures and Guidelines- 8820.3

benchmarking project recycling plastics, glass and aluminum cans is scheduled to begin in fall 2002, followed by full implementation in 2003.[8]

— **Chemicals and ODS.** Unused chemicals that are in good and stable condition are reused onsite through the *Ames Chemical Exchange* (ACE) program. All chemicals onsite are tracked through a *Hazardous Materials Inventory Control System* (HMICS) to ensure safety and possible source reduction. Ozone Depleting Substances (ODS) continue to be reduced and eliminated whenever possible through process modifications and chemical substitutions.

— **Motor Pool.** The motor pool currently recycles coolant, oil filters and oils and uses recycled oil. In addition, retread tires are utilized when possible.

— **Affirmative Procurement.** ARC continues to promote affirmative procurement and uses recycled products whenever possible as the default items procured through Stores Stock, in accordance with Comprehensive Procurement Guidelines (CPG) and EO 13101.

— **Energy.** ARC reduces energy use whenever possible through a combination alternative source of energy projects, relamping initiatives, centerwide e-mails, and use of the *Energy Saving Program Contract* (ESPC).

— **Integrated Pest Management (IPM) and Integrated Vegetative Management (IVM).** In 1997, ARC implemented an IVM program. This program mandates the use of less toxic herbicides, a reduction in the use of herbicides, and the use of endemic, drought-tolerant flora. One innovative method that supports the IVM program is the use of goats. In 1995, ARC implemented an IPM program. ARC was awarded the *Pest Management Alternatives Pioneer Award* in 1998 by *Californians for Pesticide Reform.* Since 1997, pesticide use has been reduced by 97 percent. In 2002, ARC received an award from the EPA for this program.

[8] Diane Shelander, Ames Research Center, March 6, 2002.

— **Training and Awareness.** Training and outreach programs run throughout the year. Some of these activities include seminars, centerwide e-mails, America Recycles Day, Earth Day, Pollution Prevention Week, organization-specific training, and a general *Hazardous Materials and Environmental Essentials* course.

— **ARC Pollution Prevention Award.** The Pollution Prevention (P2) award was created in 1994 to laud employees for pollution prevention activities.

— **Industrial Waste Water Treatment Facility.** ARC operates a facility that treats industrial wastewater through micro-filtration and reverse osmosis in order to recycle water for use in selected research operations.

C. The Regional Plume

A plume of contaminated ground water flows northwards beneath Ames Research Center towards the San Francisco Bay. At present, the plume underlies a total of 130 hectares (320 acres) of Ames Research Center, most of which is within the NRP area. The main contaminants in the plume are volatile organic compounds, among them trichloroethene, 1,1,1 trichloroethane, cis- and trans- 1,2 dichloroethene, 1,1 dicholoroethane, 1,1 dichloroethene, dichlorobenzene, chloroform, freon 113, phenol, and vinyl chloride. The first two are the most commonly found.[9]

The Regional Plume stems from two main sources: an EPA-designated Super Fund site outside of Ames Research Center at the Middlefield-Ellis-Whisman (MEW) site across Highway 101, and contamination from the operation of a dry cleaning facility, a former aircraft wash rack and sump, a fueling station, and numerous underground storage tanks at Moffett Field during the Navy's

[9] *Environmental Baseline Survey*, Harding Lawson Associates. October 18, 2000. p.14.

administration of the base.[10] EPA and the companies responsible for the MEW contamination signed a record of decision in 1989 that included an agreement on how and to what level the MEW Superfund site would be remediated. EPA later determined that the cleanup of groundwater and soils at Moffett Field contaminated by the MEW plume was subject to the MEW record of decision. The Navy and the MEW companies are thus jointly conducting remediation under EPA supervision, with periodic monitoring to evaluate the progress of remediation efforts. As of 1997, both the Navy and the MEW companies had designed and installed coordinated permanent remediation systems. NASA has also contributed contamination in the northern portion of the plume. In response, NASA has installed a remediation system which started operation in September 2001. EPA and the California Regional Water Quality Control Board are the oversight agencies for clean-up of the Regional Plume. Sampling has been conducted to determine whether volatilization of contaminants in the plume are contaminating soils or indoor air quality. The results of this sampling is discussed in Section 3.4: Air Quality.

D. Site Contamination

This section describes the 26 Navy contamination sites and two treatment systems, the 13 NASA contamination sites and one treatment system within the Ames Campus, and a number of other potential sources of contamination.

1. Navy Sites

Although control of Moffett Field was transferred from the US Navy to NASA in 1994, the Navy is responsible for cleaning up any contamination from its earlier use of the base. To date, 26 potentially-contaminated sites have been identified at Ames Research Center, predominantly along the western edge of the airfield and near Hangar Three, all of which pre-date NASA's administration of the property. Figure 3.7-1 identifies the potentially-

[10]Op. Cit.

contaminated sites at Ames Research Center. These sites were contaminated by wastes from 60 years of military operations. Contaminants include waste oils and fuel products, solvents and cleaning products, pesticides, paint, battery acids, and polychlorinated biphenyls (PCBs). Both the EPA and RWQCB are oversight agencies for all Navy sites.

The following list describes each of the 28 identified Navy sites and describes their current remediation status:[11]

- Site 1: a former landfill, approximately 6 hectares (14 acres) in size, that was used between 1963 and 1975. The landfill received not only domestic garbage, but also waste from maintenance and military operations, including solvents, oil, paint, paint thinners, scrap metal, and sawdust contaminated with PCBs. Testing has determined that while there is no groundwater contaminant migration from this landfill, there are gas emissions, primarily methane, from decomposing garbage. This landfill has been capped with a multilayer cover as described in the Navy's Record of Decision in accordance with their Federal Facilities Agreement and CERCLA requirements. Gas and groundwater collection trenches were dug. The groundwater and gas trenches are sampled periodically. If leachate or gas were detected, additional remediation action would be taken.
- Site 2: a former landfill approximately two hectares (five acres) in size which was operated from the 1940's through approximately 1963. This landfill is located approximately 500 meters (1,600 feet) south of Site 1, just west of the golf course. It received the same types of wastes as Site 1. The Navy, in cooperation with regulatory agencies, consolidated Sites 1 & 2 in 1997.
- Site 3: a ditch along the eastern side of Marriage Road that is located approximately 2 meters (five to six feet) below grade. Storm drains located in and near Hangars 2 and 3 discharged detergents, hydraulic fluids, oils,

[11] Personal communication with Don Chuck. 2001.

fuels, solvents, detergents, paint, and paint stripper into this ditch, parts of which are lined with concrete. Investigation in 1993 found no evidence of risks to human health or water quality, and a No Action Record of Decision was signed by the Navy, US EPA, the State of California Department of Toxic Substances Control, and the San Francisco Bay Regional Water Quality Control Board. A relatively low level of solvent contamination was found in the aquifer below the site. The slightly contaminated groundwater is being treated aboveground using air stripping.

- Site 4: this former industrial wastewater holding pond was unlined and received approximately 57 million liters (15 million gallons) of wastewater from airfield operations including aircraft washing and equipment maintenance. It was removed, closed, and replaced by new ponds in the late 1970s. During the remedial investigation, no unacceptable risks to human health were identified and a no-action record of decision (ROD) was signed in October 1994. Risk due to exposure to beryllium in soil was identified, but beryllium concentrations were found to be naturally occurring and no remedial action was appropriate. The site is completely paved, so there are no ecological risks. No further action is planned for the site. Groundwater contamination that may have occurred due to the ponds is now being treated by the East Side Aquifer Treatment System.
- Site 5: the main fuel facility for Moffett Field. The fuel farm site is divided into two parts: Site 5 north and south. Originally, the fuel farm consisted of 10 underground bulk storage tanks and four aboveground storage tanks. Six of the underground tanks were removed in 1995 from Site 5 south. The remaining eight tanks, four underground and four aboveground, are located in Site 5 north and are still in use. There is soil and groundwater contamination at both locations, with the heaviest contamination in Site 5 north. The Navy is currently studying the site as part of its petroleum

FIGURE 3.7-1

HAZARDOUS MATERIALS SITES AND PLUMES

Navy Cleanup Sites

1. Runway Landfill
2. Golf Course Landfill
3. Marriage Road Ditch
4. Former Industrial Wastewater Surface Impoundments
5. Fuel Farm French Drains
6. Unpaved Areas Surrounding Runway Apron
7. Hangars 2 and 3
8. Waste Oil Transfer Area
9. Old Fuel Farm
10. Runway Chase Park Area
11. Engine Test Stand Area
12. Firefighting Training Area
13. Equipment Parking Area
14. Abandoned Tanks (all Removed)
15. Nine Sumps Oil/Water Separators
16. PW Steam Rack Sump (Removed)
17. Paint Shop Sump
18. Dry Cleaners Sump
19. Leaking Tanks
20. Zook Road Fuel Spill
21. Patrol Ditch Road
22. Golf Course Landfill #2
23. Golf Course Landfill #3
24. Active Petroleum Sites
25. Eastern-Diked Marsh and Storm Retention Ponds
26. East-Side Aquifer Treatment System
27. Northern Channel
28. Westside Aquifer Treatment System

NASA Areas of Investigation

1. Former Jet Fuel Depot Area
2. Detection of TCE
3. Leaking Tanks (all Removed)
4. Leaking UST's (Some Removed)
5. Electrical Substations
6. Storm Drain Channel
7. Detection of VOC's
8. Detection of Petroleum Hydrocarbons
9. Detection of Petroleum Hydrocarbons and Solvents
10. Detection of PCB's and TEPH
11. UST's
12. Former Underground Storage Tanks and Detection of PCB's
13. Detection of PCB's, DDT. Lead and Zinc
14. NASA's Regional Groundwater Treatment System

Other

1. Orion Park Military Housing Area

Total Toxic Organics Regional Groundwater Plume

- 1–10 ug/l
- 11–100 ug/l
- 101–500 ug/l
- 501–11,000 ug/l
- 1,001–5,000 u g/l
- >5,000 ug/l

N

0 76m 152m 305m

0 250ft 500ft 1000ft

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NASA AMES DEVELOPMENT PLAN FINAL EIS

sites evaluation and closure program to determine what remediation will be needed. There is no remediation effort currently underway at Site 5.

- Site 6: an area just north of Hangars Two and Three where it is believed that liquid wastes from aircraft maintenance, including paint, paint stripper, oil, fuel, and solvents may have been dumped before it was paved in 1979. See the description of Site 3, above, for information on current status and treatment.
- Site 7: an area including both Hangars Two and Three and the unpaved and paved areas around them. Unpaved areas in the corners of each of the Hangars were used to dispose of liquid wastes from aircraft maintenance, including solvents, fuel, paint, paint stripper, and hydraulic fluid. In addition, a power plant in the northeastern corner of Hangar Three may have dumped solvents on unpaved areas around that Hangar. See the description of Site 3, above, for information on current status and treatment.[12]
- Site 8: this former oil transfer area is located in the northeastern portion of the Ames Campus area. From the 1940's through 1981, this area had a 19,000 liters (5,000 gallon) waste oil tank and sump, which reportedly also received transformer oils (possibly containing PCBs) and solvents. Oil spilled during transfer contaminated some soils on the site. The tank and sump were removed in 1981, and NASA remediated contaminated soils in the northern portion of Site 8 adjacent to NASA's AOI 7 through excavation and off-site disposal in 1994.[13]
- Site 9: two former groups of underground fuel tanks and their associated piping. Fuel leakage from the tanks and pipes contaminated both subsurface soils and groundwater. Groundwater contamination from Site 9 mixed with the solvents in the Regional Plume, and is being remediated

[12] Ibid, pages 6 and 7.

[13] Ibid, page 7.

by the Westside Aquifer Treatment System. The Navy determined that the soil contamination met the Regional Water Quality Control Board's requirements for low-risk closure, so no further work on the soil is planned.

- Site 10: no contaminant sources have been identified at Chase Park, but the groundwater is contaminated with volatile organic compounds from the MEW site. This site is being remediated by the pump and treat system installed to clean up the MEW groundwater contamination plume.
- Site 11: an area near the northeastern end of the runway that was used to test aircraft engines. The site is covered with a concrete and asphalt pad, but a small drainage depression likely carried spilled hydraulic fluid, waste oil, and fuel to the southern edge of the pad. See the description of Site 3, above, for information on current status and treatment.
- Site 12: the former fire-fighting training area north of Hangar 1 on the westside of the runway. Jet fuels spilled during training have contaminated subsurface soils. Most of the contaminated soils, approximately 4,200 cubic meters (5,500 cubic yards), were removed and treated in 1993. Because the site is bordered by Zook Road and the west parallel taxiway, it was not possible to remove all of the contaminated soil. The Navy evaluated the remaining contamination at Site 12, and found that it was not a threat to human or ecological receptors. No further work on the site is planned.
- Site 13: a paved area east of Hangars Two and Three that is used as parking lot. A surface drainage ditch received industrial wastewater from equipment washing, leaks, and spills. The drainage ditch flows to the main storm sewer. See the description of Site 3, above, for information on current status and treatment.
- Site 14-North: two former underground tanks located near the former dry-cleaning building, which were removed and sampled. No contamination was identified at either site.

- Site 14-South: the California Air National Guard (CANG) motor pool, which is in active use. There is both soil and groundwater contamination here from two underground tanks and their piping, which have been removed. Originally, a pump and treat system was used to remediate the site. Low permeability soils limited flow rates, however, so this approach was abandoned. Then a remediation system involving recirculating and treating the groundwater in place was operated. Currently, the Navy is allowing the site to naturally attenuate, although benzene levels in the ground water still exceed the cleanup level.
- Site 15: eight sumps, one oil/water separator, and an underground storage tank. Most have been removed, and the sites are currently being evaluated by the Navy.
- Site 16: two catch basins that drained a concrete wash pad to an underground oil/water separator. They were removed, and no contamination was found.
- Site 17: the sump for the paint shop, which received wastes including oil- and latex-based paints, thinners, toluene, and turpentine. The sump and surrounding contaminated soils were removed in 1991. No contamination remains at the site.
- Site 18: the sump on the northern (down gradient) side of the former dry-cleaning building. The sump was removed, and no contamination from it was found. However, the dry cleaning building, foundation, and underground piping were demolished and removed along with approximately 300 cubic meters (400 cubic yards) of soils contaminated with cleaning solvents. No further soil contamination exists, but groundwater contamination from the dry cleaning operation is being remediated as part of the Navy clean-up effort.
- Site 19: four underground storage tanks that have been removed. One of the tanks is believe to be a source of the solvent contamination in the groundwater in the Eastside/Airfield area. This contamination is being addressed by the Eastern Aquifer Treatment System.

- Site 20: an area north of Hangar One adjacent to the Airfield where off-specification fuels were stored in above ground tanks, which were removed in 1982. Fuels spilled from these tanks and accumulated in low areas near the taxiways, runways, and Zook Road. As a result, the soil and groundwater are contaminated with low levels of petroleum products. The Navy has determined that Site 20 meets the criteria for low-risk closure, and no further work is recommended for this site.
- Site 21: a surface drainage ditch on the northern edge of the Eastside/Airfield area that caries some of the stormwater flow from the eastern side of Ames Research Center. Reportedly, waste fluids including transmission fluid, hydraulic fluid, and motor oil were dumped here. This site is to be further evaluated for ecological risks, along with the Marriage Road Ditch and Site 27, described below.
- Site 22: a 120-meter (400-foot) wide strip of landfill in the northeastern corner of the golf course lying between East Patrol and Marriage Roads. The landfill was in active use from the late 1940s until the 1960s. There are no records of what was dumped at the site, but it is thought to be primarily household waste. The Navy has issued a proposed plan to install a biotic barrier along the sides of the landfill to prevent burrowing animals from bringing up garbage from the landfill. The Navy will also be monitoring the groundwater at the site.
- Site 23: a former landfill approximately 1 hectare (two acres) in size located immediately south of the northern weapons bunker area. There is no record of the source of the material dump, but a site walkover identified construction and landscaping materials such as concrete, asphalt, grass clippings and mulch. Aluminum airplane parts and electronic equipment were also found. There is no evidence of any hazardous materials, so no further work is planned for the site.
- Site 24: the fuel pits in Hangar One, the high-speed fuel facility on the east side of the base, and the fuel wharf. No petroleum contamination was found at the Hangar One fuel pits, though there are solvents in the

underlying groundwater. Minor amounts of contamination were found at the fuel wharf and the high speed fuel facility. The sites are being evaluated by the Navy.

— Site 25: the Eastern-diked marsh and the storm water retention pond. PCB's pesticides, and some metals require remediation in the sediments. The Navy is proposing to excavate the contaminated portions of the site and replace them with clean material.

— Site 26: the Eastside Aquifer Treatment System for addressing the solvent plume from Hangar 3. This is not itself a contaminated site.

— Site 27: the Northern Channel. The principal contaminant is PCBs. The Navy is currently studying the site in order to develop a plan to remediate it.

— Site 28: the Westside Aquifer Treatment System for remediating the Navy's portion of the Regional Plume. This is not itself a contaminated site.

2. NASA Areas of Investigation within the Ames Campus

NASA and its predecessor, NACA, have conducted research at the Ames Campus since 1940. NASA has discovered 13 contaminated areas, which it refers to as Areas of Investigation (AOI), within the Ames Campus. This section describes each of the AOIs and their current remediation status.

— AOI 1: the former jet fuel depot located in the southeast corner of the Ames Campus. Four 75,000 liter (20,000 gallon) underground storage tanks were removed from the area, and NASA excavated most of the fuel-contaminated soil in April, 1996. The extent of the remaining fuel-contaminated soil was roughly delineated in December 1996. In April 1999, a soil and groundwater study was conducted approximately 80 to 140 meters (250 to 450 feet) down-gradient of the former fuel farm. No soil contamination was found. A grab groundwater sample from one location contained TPHD at a concentration of 890 Fg/l. The oversight agencies for AOI 1 are EPA and the RWQCB.

- AOI 2: the area around Buildings N-239, N-239a, N-210, N-243, and N-243A. Well sampling results confirm that although there is an elevated level of TCE between Buildings N-210 and N-239A, shallow soil samples taken in June 1996 in the area around the well show no solvent concentrations above the clean up levels. The MEW companies are pumping and treating groundwater in this area for chlorinated solvents, but NASA currently has no further work planned in the area. The oversight agencies for AOI 2 are EPA and the RWQCB.
- AOI 3: two groups of underground storage tanks in the area between and around Buildings N-248A, N-248B and N-259 on the north side of the aircraft ramp. The tanks were known to have leaked and were removed. NASA excavated the contaminated soil in 1994 and 1995. Subsequent analyses of soil and groundwater sampled from within the eastern portion of AOI 3 have detected petroleum hydrocarbons and VOC's above clean up levels. The oversight agencies for AOI 3 are EPA and the RWQCB.
- AOI 4: twelve underground storage tanks in an area on the west side of the Ames Campus that includes the National Full-Scale Aerodynamics Complex (the 40' x 80' and 80' x 120' wind tunnels), and the surrounding area. Several of the twelve underground storage tanks have leaked and all have been removed. Two were replaced with double-wall tanks. Analyses of soil and groundwater samples from within AOI 4 have detected petroleum hydrocarbons and VOC's. NASA prepared a Removal Action Work Plan for the site that has been finalized under California Department of Toxic Substances (DTSC) oversight. In addition to the petroleum hydrocarbons, investigation along the southwest side of AOI 4 and in the Orion Park Military Housing area adjacent to it have shown TCE concentrations above clean-up levels, which appear to be flowing onto NASA property from the upgradient housing area. TCE will be studied and if necessary remediated separately. The oversight agency for AOI 4 is DTSC.

- AOI 5: two electrical substations (Buildings N-225 and N-225A), a drum storage area, and one underground storage tank located in the western portion of the Ames Campus. The drum storage area was closed in the mid-1980s, and the tank was removed in 1990. The electrical substations remain. Analyses of soil and groundwater samples from within AOI 5 have detected petroleum hydrocarbons, PCBs, and VOCs. The oversight agency for AOI 5 is DTSC.
- AOI 6: the storm drain channel and adjacent soil parallel to Lindbergh Avenue, bordered on the east by AOI 7 and by Navy Site 8. Metals, oil and grease, and PCBs were detected at this site around the channel and in the sediment in the channel. A removal action in 1994 removed most of the contaminants and Navy Site 15, Sump 64. Results from additional surface soil sampling indicate that there are low levels of contamination laterally adjacent to the former storm channel. Soil sampling has found PCB and lead levels above ecological and residential clean-up levels. NASA completed additional remediation in October 2001. The oversight agencies for AOI 6 are EPA and the RWQCB.
- AOI 7: a vertical takeoff and landing area located in the Bay View area. It is bordered to the south by a storage yard that is included in Navy Site 8. Soil and groundwater sampling have detected VOCs. Two of NASA's Regional Groundwater Remediation Plan (RGRP) wells were placed in AOI 7 in 1999. The remediation system began operations in September 2001. The oversight agencies for AOI 7 are EPA and the RWQCB.
- AOI 8: the Navarro farms area includes Building N-267 and a bioremediation pad located at the northwest corner of Ames Research Center adjacent to the North of Bay View area. Analyses of soil and groundwater have detected petroleum hydrocarbons above clean-up levels. Four monitoring wells track the quality of the groundwater. Source removal is planned, as well as an upgrade to the remediation facilities. The oversight agency for AOI 8 is DTSC.

- AOI 9: an area on the east side of the Ames Campus including Buildings N-244 and N-245, the soccer field, and a child care center. No underground storage tanks are know to exist within AOI 9. Despite this, analyses of soil and groundwater samples have detected petroleum hydrocarbons and solvents, apparently originating from AOI 3, which is located immediately to the southwest of AOI 9, or from former localized waste dumping practices. Two of NASA's RGRP extraction wells were placed in AOI9 in 1999. The remediation system began operations in September 2001. The oversight agencies for AOI 9 are EPA and the RWQCB.
- AOI 10: the three electrical substations that are not located in any of the other AOIs. Transformer oil containing PCBs was used historically in many of the transformers in the Ames Campus. PCBs were detected above the restricted area clean-up level in one soil sample from the Building N-221C Substation. TEPH was detected above the petroleum hydrocarbon clean-up level in one soil sample from the Building N-227 Unitary Substation. NASA has proposed in-situ bioremediation of fuel-contaminated soils at the Building N-227 Unitary Substation, and excavation of PCB-contaminated soils at the Building N-221C Substation, when the substation is no longer in service. The oversight agency for AOI 10 is DTSC.
- AOI 11: fourteen existing or former underground storage tanks at nine sites not located in other AOIs. All of these tanks have been removed. One (Tank 7) was replaced with a double-wall tank. All of the three former single-wall tanks at the Building N-251 motor pool were replaced with two double-wall tanks. Contamination remains at Tank Sites 7 and U-14. New Tanks 25 and 26 (Motor Pool) are still in use. The remaining tank sites are now clean. The oversight agency for AOI 11 is DTSC.
- AOI 12: the area around Building N-211, the aircraft hangar. Petroleum hydrocarbons are present in a groundwater monitoring well to the east of the hangar either from two former underground storage tanks, or from an

unknown upgradient source. The oversight agencies for AOI 12 are EPA and the RWQCB.

- AOI 13: the wetlands north of and within the North of Bay View area, including the Eastern and Western Diked Marshes, and the Storm Water Retention Pond. This is the same as Navy Site 25. The primary contaminants in these areas are PCBs, DDT, lead and zinc. The Navy has the lead for site investigation and remediation. NASA has also contributed to contamination in AOI 13. The oversight agencies for AOI 13 are EPA and the RWQCB. NASA is also complying with the relevant requirements of USFWS and CDFG.

3. Other Potential Sources of Contamination

This section summarizes known information regarding storage tanks, lead-based paint, asbestos, PCBs, spent abrasive materials, radon, mold, medical/biohazardous waste, and pesticides at Ames Research Center.

a. Storage Tanks

Several hundred underground storage tanks have been present at Ames Research Center, most of which have been removed. The removed tanks are in various stages of the closure and/or remedial investigation process. Many of the aboveground storage tanks, sumps, and oil/water separators were also removed. Tanks that were still needed and in compliance were kept, while others were replaced with double-wall tanks.

b. Lead-Based Paint

Many of the buildings at Ames Research Center have been surveyed for lead-based paint. Because lead-based paint was in common use before 1978, it is assumed that the majority of the buildings at Ames Research Center contain it. Sampling has also found lead contamination in the soils surrounding some of the buildings that had lead-based exterior paint.

c. Asbestos

As with lead-based paint, only a portion of the buildings at Ames Research Center have been tested for asbestos containing materials (ACMs). However, ACM's were in common use into the 1970s, and were found in almost all of the buildings tested. Common ACMs at Ames Research Center include pipe lagging, floor and ceiling tile, sheetrock, waterlines, and gasket material.

d. Polychlorinated Biphenyls

There is a substantial amount of documentation of the presence of Polychlorinated Biphenyls (PCBs) at Ames Research Center, including a basewide inventory conducted by the Navy prior to handover, and quarterly inspections still being carried out by the NASA Environmental Services Office in compliance with 40 CFR 761. Known items containing PCBs include capacitors, regulators, oil fuse cutouts, oil circuit breakers, oil switches, transformers and fluorescent light ballasts. Many of the known pieces of equipment with PCBs have already been removed and disposed of.

NASA is currently preparing an Human Health Risk Assessment for soil contamination from previous agricultural use in the Bay View area. Sampling conducted in 2001 found no PCBs. Low concentrations of metals and pesticides were found, but the levels of contamination were low enough that the risk to human health was below EPA standards for total lifetime exposure.[14] There are two known contamination sites south of the Bay View area at the downgradient end of the off-site Orion Park plume, AOI 5 and AOI 11. NASA is working on the Removal Action Workplans for these two sites.

e. Mold

Different mold varieties can cause a range of illnesses, including infectious diseases, allergies, and dermatitis. Mold has been detected in various buildings

[14] *Surface Soil Investigation Report of Findings/Bay View Redevelopment Area.* August 9, 2001. Prepared by Professional Analysis, Inc. for NASA Ames Research Center, Office of Environmental Services.

within Ames Research Center. NASA has issued guidelines with precautions for entering these buildings.

f. Pesticides

Currently, NASA uses the herbicides Round-up, Rodeo, Direx 4L, Surflan, and Turflon, and the pesticides Gas cartridges, Maxforce gran, Tempo dust, Avert, Terro ant bait, Dragnet, and BP 100.[15] A number of other pesticides were used at Moffett Field in the past, and there is a potential for residual levels of chemicals in soil. In particular, the pesticide dieldren has been found in surface soil samples in the Bay View area in concentrations above residential risk-based screening levels.

g. Other Potential Sources

Some medical or biohazardous waste has been and is generated within Ames Research Center. At present, very small quantities of medical and biohazardous wastes are generated in three locations at the Center as a result of research activities and the operation of the Center's Health Unit. There are a few locations where uncontrolled blasting could have occurred at Ames Research Center, such as the wind tunnels. Testing has not found any radon levels above the EPA's action levels.[16]

E. Adjacent Off-Site Contamination

During the investigation and monitoring activities for NASA AOIs 4 and 11, low levels of TCE were discovered in the groundwater in Orion Park. In order to locate the source of TCE, NASA conducted several investigations. A review

[15] *Draft Environmental Resources Document for the National Aeronautics and Space Administration Ames Research Center*. March 2000. pp. 202-03.

[16] *Environmental Baseline Survey*, Harding Lawson Associates. October 18, 2000. pp.17- 23.

of well data and subsurface geology indicates that the TCE is coming from the off-site housing area, and then flowing beneath the western portion of the Ames Campus. The US Navy is planning to continue with the investigation of Orion Park in order to determine the source of the TCE. NASA is also planning further investigation of the area to better define subsurface conditions with the goal of implementing some control measures to prevent further migration of the TCE onto the Ames Campus and to prevent its migration beneath Bay View. Potential hazardous materials contamination may also exist in the nearby Mountain View industrial area, where some hazardous materials users operate.

3.8 GEOLOGY

This section describes existing geological conditions at Ames Research Center, focusing on its topography, geology, seismology, and the make up of its soils.

A. Topography

Ames Research Center sits on a flat alluvial plain along the southwestern edge of the San Francisco Bay. The site rises gradually from north to south, rarely at more than a one per cent slope. The main topographical features are low man-made berms created to protect roads and structures from the waters of the Bay.

Because of extensive overuse of the groundwater basin beneath it, a large area of the Santa Clara Valley experienced gradual land subsidence between 1932 and 1969. At Moffett Field, the land sank between 1.5 and 2.0 meters (5.5 and 6.0 feet) during that time period. To halt the subsidence throughout the Valley, the Santa Clara Valley Water District established a program to create numerous surface reservoirs to promote artificial recharge of aquifers in the late 1960's. This program, combined with greater usage of outside water sources and control of groundwater pumping rates, has been successful in raising the water table; subsidence is no longer a serious problem in the Santa Clara Valley or at Ames Research Center. Limited fluctuation in groundwater levels during wetter-than-average or drier-than-average years, which previously might have threatened buildings, is now unlikely to cause any structural damage. Long utility lines, such as storm water channels, are more sensitive to local land subsidence, however, and have been designed to minimize any problems.[1, 2]

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[1] *Draft Environmental Resources Document for the National Aeronautics and Space Administration Ames Research Center*. 2000.

[2] *Master Plan Short-Range Projects Final Environmental Assessment*, California Air National Guard, 129th Rescue Wing. March 1997. pp 3-4 - 3-5.

B. Geology

Ames Research Center sits in the broad, gradually-sloping Santa Clara Valley, a large structural trough descending towards the San Francisco Bay between the Diablo Range to the northeast and the Santa Cruz Mountains to the southwest. The Valley's soil has been built up by alluvial deposits of gravel, sand and clay that are now more than 300 meters (1,000 feet thick).[3]

C. Soils

Surface soils along the edges of the San Francisco Bay are composed mostly of fine-grained clays and silts. Subsurface conditions documented in the logs of borings drilled previously in the area consist of varying thicknesses of medium-stiff to stiff silty/sandy clay with occasional layers and lenses of medium-dense to very dense sand and gravel. Pockets of soft/medium stiff clayey soils up to a few meters (several feet) thick were found in some borings at depths ranging from 2 to 5 meters (5 to 15 feet). The near-surface soils, which form a stiff crust because of desiccation, were found to be mostly expansive clayey soils.

The majority of Ames Research Center is underlain by Sunnyvale silty clay, which consists of silty clay to a depth of 28 to 46 centimeters (11 to 18 inches) with a dark gray color, fine texture, poor drainage, moderate alkalinity, and high fertility. The subsoil is light gray and gray calcerous silty clay to a depth of 66 to 81 centimeters (26 to 32 inches).

The western edge of the Bay View area sits on Pacheco loam, which consists of a fine sandy loam, loam, or clay loam to a depth of 36 to 46 centimeters (14 to 18 inches). Pacheco loam is characterized by its grayish-brown color, poor drainage, and moderate alkalinity and fertility. Seasonal water tables sometimes lie within as little as 0.6 meters (two feet) of the surface. The subsoil

[3] Ibid.

is moderately alkaline loam, mottled light gray in color, in a layer between 46 and 64 centimeters (18 and 25 inches) deep.

The northern end of the Eastside/Airfield area sits on Alviso clay, which consists of slightly calcareous, neutral- to moderately-alkaline soil in a layer approximately 15 to 25 centimeters (6 to 10 inches) thick. The top centimeters of soil may consist of a layer of organic material. Alviso clay is characterized by a gray to dark gray color, poor drainage and low fertility. Because the water table sits only 0.3 to 1 meter (one to three feet) below the surface, Alviso clay is usually damp. The subsoil is gray or light gray in color, calcareous, and moderately alkaline, and has a silty clay texture.

There are two areas at Ames Research Center, one on the northern end of the Bay View area and one in the middle of the Eastside/Airfield area, where soils are classified as Kitchen middens. This soil is dark gray calcareous or clay loam with ashes, shell fragments, stones and some bones mixed in.[4]

The soil types described above pose several potential issues related to construction at Ames Research Center. First, these soils are quite malleable and easy to compress, which can lead to soil compression and differential settlement around buildings. Second, the high clay content of the soil gives it a strong shrink-swell potential with seasonal fluctuations in the water table, which can stress shallow concrete slabs and pavement and cause cracking and heaving. Finally, the soil has low permeability; water passes through it very slowly. This can cause localized flood conditions during heavy rains, and can corrode untreated pipes.[5]

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[4] *Draft Environmental Resources Document for the National Aeronautics and Space Administration Ames Research Center*. 2000.

[5] Ibid.

D. Seismology

Ames Research Center is situated in the San Francisco Bay region, one of the most seismically active areas of the United States. There is very little possibility of ground-surface rupture at the Center because there are no known active faults within it, but it is located in close proximity to three active faults: the Hayward Fault 14 kilometers (9 miles) to the northeast, the Calaveras Fault 21 kilometers (13 miles) to the northeast, and the San Andreas Fault 14 kilometers (9 miles) to the southwest. There are several other faults in the Santa Clara Valley, all of which are inactive. Historically, the greatest seismic activity has been along the San Andreas Fault zone. The maximum credible earthquake expected on the San Andreas Fault is 8.3 on the Richter scale; on the Hayward and Calaveras Faults it is 7.5. Plausible seismic hazards at Ames Research Center thus include ground shaking, liquefaction, differential settlement, and lurch cracking. Potential impacts from earthquakes along these faults have been, and continue to be, addressed in siting, structural design, and construction of buildings at Ames Research Center.[6]

[6] *Draft Environmental Resources Document for the National Aeronautics and Space Administration Ames Research Center*. 2000.

3.9 BIOLOGICAL RESOURCES

This section provides information about biological resources at Ames Research Center, including the types and distribution of vegetation, habitat (including wetlands), wildlife, and special-status species.

A. Methodology

The information presented in this section was drawn largely from the results of biological studies that have been previously conducted at Ames Research Center. The following documents were utilized in the preparation of this section and are available as noted in Chapter 6 of this EIS.

- *Results of Preliminary Salt Marsh Harvest Mouse Surveys, July 22-26, 1991*, by D. Pomeroy, Naval Facilities Engineering Command, 1991.
- *Ecology of the California Black Rail at Naval Air Station Moffett Field*, by U.S. Fish and Wildlife Service, 1993.
- *Sensitive Species at Moffett Field, 1994*, by V.L. Layne and E.K. Harding-Smith, 1995.
- *Directed Rare Plant Surveys for California Sea-Blite and Point Reyes Bird's Beak at NASA Ames Research Center and Moffett Federal Airfield, CA*, by D.B. Zippin and T.M. Engels, 1997.
- *Moffett Federal Airfield, California, Final Phase II Site-wide Ecological Assessment,* by PRC Environmental Management and Montgomery Watson, 1997.
- *Vegetation Surveys and Mapping at Moffett Field, CA*, by Science Applications International Corporation (SAIC), 1999.
- *Burrowing Owl Habitat Management Plan: Evaluation of Impacts to Burrowing Owls and Identification of Avoidance and Mitigation Measures for the NASA Ames Development Plan,* by L. Trulio, 2001.
- *Heritage Tree Survey*, by C. Alderete, NASA, 2001.
- *Amphibian Survey of Moffett Field, Santa Clara County, California, with Focus on the California Red-Legged Frog (Rana aurora draytonii) and the California*

Tiger Salamander (Ambystoma californiense) by N.J. Scott and C. Alderete, July 2001.

— *Western Pond Turtle Survey* by Chris Alderete, 2002.

As necessary, fieldwork was conducted on-site to fill gaps in existing data and provide additional information about the resources in the planning areas. Specifically, Jones & Stokes biologists conducted vegetation surveys on August 31, 2000 and September 27 and 28, 2000 to verify information and supplement mapping coverage in the SAIC and Site-wide Ecological Assessment (SWEA) report. During these surveys, Jones & Stokes staff walked areas not included in these reports (excluding the golf course and California Air National Guard areas), identified the dominant species in these areas, and classified the areas using the habitat designations employed in the SAIC report.

During the site visits on September 27 and 28, 2000, Jones & Stokes staff also conducted a wetland delineation on portions of the Ames Research Center site, including the Bay View area, the Eastside/Airfield area (excluding the golf course), and the area immediately north of the Bay View area (North of Bay View area). Field methods were those specified in the wetlands delineation manual of the U.S. Army Corps of Engineers (Corps).[1] Results of the wetland delineation were verified by the Corps in May 2001 and are incorporated by reference, as described in Chapter 6 of this EIS.

Before starting fieldwork, Jones & Stokes compiled a table of special-status species that occur or that may occur within or adjacent to Ames Research Center. Information from focused special-status species reports was integrated with information provided by California Department of Fish and Game (CDFG) and U.S. Fish and Wildlife Service (USFWS) databases. Sources used in this compilation include the previously noted studies by Layne and Harding-Smith,

[1] Environmental Laboratory, U.S. Army Waterways Experiment Station. *U.S. Army Corps of Engineers Wetlands Delineation Manual (Technical Report Y-87-1).* 1987.

Trulio, and Zippin and Engels, as well as CDFG's Natural Diversity Data Base and the California Wildlife Habitat Relationships system.

Special-status species include plants and animals that are legally protected under state and federal Endangered Species Acts or other regulations, as well as species considered sufficiently rare by the scientific community to qualify for such listing. Special-status species include the following categories of plants and animals:

- Plants listed or proposed for listing as threatened or endangered under the federal Endangered Species Act;
- Plants that are candidates for possible future listing as threatened or endangered under the federal Endangered Species Act;
- Plants listed under the California Native Plant Protection Act;
- Plants that meet the definition of rare or endangered under the California Environmental Quality Act, including those considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California";[2]
- Animal species of special concern to the California Department of Fish and Game;[3] and
- Animals fully protected in California.[4]

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[2] CNPS Lists 1B and 2 in Skinner, M.W. and B.M. Pavlik. *Inventory of Rare and Endangered Vascular Plants in California*. 1994.

[3] Remsen, J.V. *Bird Species of Concern in California: An Annotated List of Vulnerable Bird Species*. 1978 [birds]; Williams, D.F. *Mammalian Species of Special Concern in California*. 1986 [mammals]; Jennings, M.R. and M.P. Hayes. *Amphibian and Reptile Species of Special Concern in California*. 1994 [amphibians and reptiles].

[4] California Fish and Game Code, Sections 3511 [birds], 4700 [mammals], and 5050 [amphibians and reptiles].

Table 3.9-1 lists special-status plant species that occur or may occur in the Ames Research Center area, and Table 3.9-2 lists special-status animal species that occur or may occur in the area. Both tables are located at the end of this chapter.

B. Regulatory Environment

This section describes relevant State and federal regulations of biological resources.

1. Federal Laws

The federal laws that regulate the treatment of biological resources are the Endangered Species Act, the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, the Clean Water Act, and the National Environmental Policy Act. The following section discusses the relevant portions of each of them.

a. Endangered Species Act

The Endangered Species Act (ESA) (16 U.S.C. § 1531 *et seq.*) protects fish and wildlife species that are listed as threatened or endangered, and their habitats. "Endangered" species, subspecies, or distinct population segments are those that are in danger of extinction through all or a significant portion of their range, and "threatened" species, subspecies, or distinct population segments are likely to become endangered in the near future. The ESA is administered by the U.S. Fish and Wildlife Service.

i. Section 9

Section 9 of the federal Endangered Species Act (ESA) of 1973, as amended, prohibits the take of any fish or wildlife species listed under the ESA as endangered. Take of threatened species is also prohibited unless otherwise authorized by federal regulations. Take, as defined by the ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Harm is defined as "any act that kills or injures the species, including significant habitat modification." Section 9 of the ESA also

prohibits removing, digging up, cutting, maliciously damaging or destroying federally-listed plants on sites under federal jurisdiction.

ii. Section 7

Section 7 of the ESA requires federal agencies to ensure that their actions do not jeopardize the continued existence of a listed fish or wildlife species, or destroy or adversely modify that species' critical habitat; as defined and designated by federal regulations. Under Section 7 of the ESA, federal agencies are also prohibited from jeopardizing the continued existence of any federally-listed plant species in issuing any permit.

In order for a proposed federal action to comply with Section 7 of the ESA, a biological assessment (BA) is typically prepared to document the action's expected impacts and propose mitigation to compensate for those impacts. During the scoping process for this action, the U.S. Fish and Wildlife Service (USFWS) indicated that a consultation will be required. NASA has prepared a BA, reproduced in Appendix E, to assist the USFWS in making a determination regarding the effects of the proposed action on listed species. Federally-listed species that are known to occur in the North of Bay View area, and may occur in the Bay View area, include: California brown pelican, California clapper rail, California least tern, western snowy plover, and salt marsh harvest mouse (see Table 3.9-2).

b. Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) (16 U.S.C. § 703-712 *et seq.*), administered by the U.S. Fish and Wildlife Service, implements a series of treaties between the United States, Mexico, and Canada that provide for the international protection of migratory birds. The law contains no requirement to prove intent to violate any of its provisions. Wording in the MBTA makes it clear that most actions that result in "taking" or possession (permanent or temporary) of a protected species can be a violation of the Act. The word take is defined as meaning "pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect." The provisions of the MBTA are nearly absolute; "except as permitted by regulations" is the only

exception. Examples of permitted actions that do not violate the law are the possession of a hunting license to pursue specific gamebirds, legitimate research activities, display in zoological gardens, bird-banding, and similar activities.[5]

c. Bald and Golden Eagle Protection Act

Bald eagle protection began in 1940 with the passage of the Eagle Protection Act; the Eagle Protection Act was later amended to include the golden eagle and was renamed. The Bald and Golden Eagle Protection Act (16 U.S.C. § 668 *et seq.*) makes it unlawful to import, export, take, sell, purchase, or barter any bald eagle or golden eagle, their parts, products, nests, or eggs. Take includes pursuing, shooting, poisoning, wounding, killing, capturing, trapping, collecting, molesting, or disturbing. Exceptions may be granted by the USFWS for scientific or exhibition use, or for traditional and cultural use by Native Americans. However, no permits may be issued for import, export, or commercial activities involving eagles.

d. Clean Water Act

The Clean Water Act (33 U.S.C. § 1251 *et seq.*) is an amendment to the Federal Water Pollution Control Act of 1972, which outlined the basic structure for regulating discharges of pollutants to waters of the United States. There are several sections of this Act that pertain to regulating impacts to wetlands. The discharge of dredged or fill material into waters of the United States is subject to permitting under Section 404 (Discharges of Dredge or Fill Material). Section 401 (Certification) specifies additional requirements for permit review, particularly at the state level. The Clean Water Act is administered by EPA and USACE.

i. Section 401: Water Quality Certification

Section 401 of the federal Clean Water Act (CWA) gives individual states the authority to issue, waive, or deny certification that a proposed activity is in conformance with state water quality standards (Water Quality Certification). Projects, including those that require permits from the Corps under Section 404

[5] Faanes et al. *Birders and U.S. Federal Laws*. 1992.

of the CWA (see below), are reviewed by the State's Regional Water Quality Control Boards. The Ames Research Center site is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board.

ii. Section 404: Discharge of Dredged and Fill Materials into Waters of the United States

The U.S. Army Corps of Engineers and the Environmental Protection Agency (EPA) regulate the placement of fill and dredged materials into waters of the United States under Section 404 of the federal Clean Water Act. Waters of the United States include lakes, rivers, streams, and their tributaries, as well as wetlands. Wetlands are defined for regulatory purposes as areas "inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Project proponents must obtain a permit from the Corps for all discharges of dredged or fill material into waters of the United States, including wetlands, before proceeding with a proposed action.

The Corps may either issue individual permits on a case-by-case basis or general permits at a program level. General permits are pre-authorized, and are issued to cover similar activities that are expected to cause only minimal adverse environmental effects. Nationwide Permits (NWPs) are a type of general permit issued to cover particular fill activities. NWPs have a set of conditions that must be met for the permits to apply to a particular project, as well as specific conditions that apply to each NWP.

e. National Environmental Policy Act

The National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. § 4321 *et seq.*) requires federal agencies to include in their decision-making process appropriate and careful consideration of all environmental effects of a proposed action and of possible alternative actions. Measures to avoid or minimize the adverse effects of proposed actions, and to restore and enhance environmental quality as much as possible, must be developed and discussed where feasible. This analysis is documented in either an environmental assessment (EA) or an

environmental impact statement (EIS). This document was prepared to comply with the requirements of NEPA.

2. State Laws

The most relevant State laws regulating biological resources are the California Endangered Species Act, the California Native Plant Protection Act, and the California Fish & Game Code, each of which is described below.

a. California Endangered Species Act

The California Endangered Species Act (CESA) protects wildlife and plants listed as threatened and endangered by the California Fish and Game Commission. It is administered by CDFG. CESA requires State agencies to conserve threatened and endangered species (Section 2055), and thus restricts all persons from taking listed species except under certain circumstances. The CESA defines take as any action or attempt to "hunt, pursue, catch, capture, or kill." CDFG may authorize take under Section 2081 agreements, except for designated "fully protected species." The requirements for an application for an incidental take permit under CESA are described in Section 2081 of the California Fish and Game Code and in final adopted regulations for implementing Sections 2080 and 2081.

b. California Native Plant Protection Act

The California Native Plant Protection Act of 1977 prohibits importation of rare and endangered plants into California, take of rare and endangered plants, and sale of rare and endangered plants. CESA defers to the California Native Plant Protection Act, which ensures that state-listed plant species are protected when state agencies are involved in projects subject to CEQA. In this case, plants listed as rare under the California Native Plant Protection Act are not protected under CESA but rather under CEQA.

The following kinds of activities are exempt from the California Native Plant Protection Act:

- agricultural operations;
- fire control measures;
- timber harvest operations;
- mining assessment work;
- removal of plants by private landowners on private land for construction of canals, ditches, buildings, roads, or other rights-of-way; and
- removal of plants for performance of a public service by a public agency or a publicly- or privately-owned public utility.

c. California Fish and Game Code

The California Fish and Game Code provides protection from take for a variety of species. Section 5050 lists protected amphibians and reptiles. Eggs and nests of all birds are protected under Section 3503, nesting birds (including raptors and passerines) under Sections 3503.5 and 3513, birds of prey under Section 3503.5, and fully protected birds under Section 3511. All birds that occur naturally in California and are not resident game birds, migratory game birds, or fully protected birds are considered non-game birds and are protected under Section 3800. Mammals are protected under Section 4700. Hawks, falcons, and owls that occur in Ames Research Center are thus protected under Section 3503.5 and non-game birds under Section 3800. In addition, several bird species listed under Section 3511, including golden eagles and white-tailed kites, occur or have the potential to occur in Ames Research Center.

Because NASA is a federal agency, and because the NADP is a federal action, the California Fish and Game Codes do not apply unless this action will:

- Result in take of a State-listed (endangered or threatened) species.
- Result in mortality of a fully-protected species.
- Affect the bed or bank of a stream.

Even though the California Fish and Game Codes may not apply to this action, NASA chooses to comply with them and has analyzed potential impacts from the NADP accordingly.

d. Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Act (PCWQA), passed in 1975, functions in coordination with the federal Clean Water Act (CWA) described above, to ensure state compliance with the federal CWA. The Porter-Cologne Act provides for the development and periodic review of Water Quality Control Plans (basin plans) that designate beneficial uses of California's major rivers and groundwater basins and establish narrative and numerical water quality objectives for those waters. Basin plans are primarily implemented by using the NPDES permitting system to regulate waste discharges so that water quality objectives are met. The Regional Water Quality Control Board (RWQCB) will be involved in the certification of any federal permits obtained to comply with CWA. Activities in areas that are outside of the jurisdiction of the US Army Corps of Engineers (e.g. isolated wetlands or stream banks above the ordinary high water mark) are regulated by the Regional Board under the authority of the Porter-Cologne Water Quality Control Act. Activities that lie outside of Corps jurisdiction may require the issuance, or waiver, of water discharge requirements from the Regional Board. Improvements to the storm drain system could require either Section 401 Certification or waste discharge requirements.

C. Wetland Delineation

The wetland delineation for NASA-Ames Research Center was verified by the Army Corps of Engineers (Corps) in May 2001, and is included in Appendix E of this document. Some of the seasonal wetlands identified in the Bay View area in the preliminary wetland delineation were eliminated from the final verification based upon the human-induced ponding mechanism that, when removed, also removed wetland indicators from the ponded areas. Thus, the total area of verified wetlands near the Bay View Area (2.1 hectares (5.3 acres)) is less than identified in the preliminary delineation (2.2 hectares (5.5 acres)).

The results of the final delineation identify waters of the United States, including seasonal wetland areas in the North of Bay View and Eastside/Airfield development areas. Seasonal wetlands were identified in the North of Bay View area and include drainage areas adjacent to Victory Road, as well as areas to which water from the settling basins are pumped annually. The wetland delineation identified the Eastern and Western Diked Marshes as seasonal wetlands in North of Bay View area. The Eastside/Airfield contains both waters of the US and seasonal wetlands. The waters of the US include the Northern Channel and portions of the ditches along Marriage and North Patrol Roads. Seasonal wetlands and wetland mosaics are located within the airfield itself, at the northern end. Areas not surveyed in the 2001 wetland delineation, but identified in previous reports and delineations as waters of the US, including seasonal wetlands, include the ponds on the golf course and the stormwater retention pond in the North of Bay View area.

D. Existing Biological Resources

The following sections discuss existing biological resources at Ames Research Center. Sections are organized geographically. The first three sections discuss resources in the NRP and Ames Research Center (ARC) Facilities areas, the Bay View area, and the Eastside/Airfield area, respectively. A fourth section summarizes resources immediately north of the Bay View area, adjacent to but outside of the area, referred to herein as the North of Bay View area. Tables 3.9-1 and 3.9-2 summarize special-status species that occur or may occur at or in the vicinity of Ames Research Center.

As has been documented in recent environmental reports, there are no designated critical habitat areas within or near Ames Research Center. All of the existing habitat areas in the vicinity have been extensively disturbed by agriculture and development over the past two centuries.

1. NRP and Ames Campus Areas

The NRP and Ames Campus Areas are both highly urbanized areas of the Ames Research Center site. The bulk of development has occurred in these two areas, and as a result what little habitat remains is disturbed and fragmented. Existing resources within the NRP and Ames Campus areas are very similar and are therefore addressed together.

a. Vegetation

Habitat types in the NRP and Ames Campus planning areas include weed-dominated areas, disturbed areas and developed areas. Figure 3.9-1 shows the distribution of these habitat types.

i. Weed-Dominated Areas

Weed-dominated habitat occurs along roadsides and in undeveloped infill parcels in the NRP and Ames Campus areas. Extensive development has contributed to the establishment of weedy species; in many cases weed-dominated areas are mowed or exhibit the effects of other past disturbance.

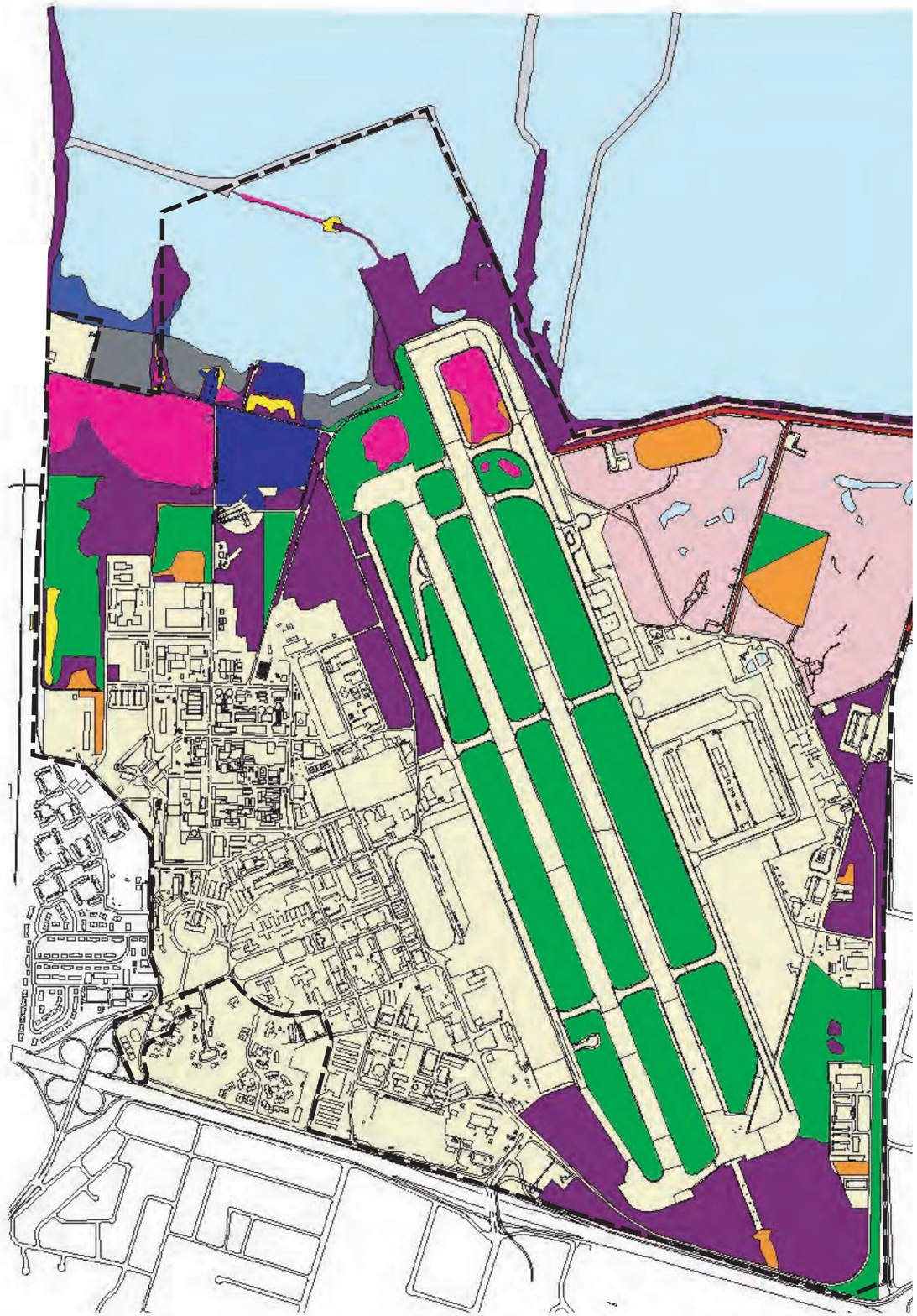
This habitat type is generally dominated by non-native annual herbs, primarily bristly ox-tongue (*Picris echiodes*), scattered geranium (*Geranium dissectum*), and non-native annual grasses (*Avena* spp., *Polypogon monspeliensis*, *Hordeum* spp., *Vulpia* spp.). These sites may also support invasive exotic weeds that crowd out native species and create a monoculture habitat with little value to wildlife. The dominant species in this habitat may alternate between non-native grasses and weedy herbs, depending on the season, amount of rainfall, and maintenance activities (e.g., mowing).

ii. Disturbed Areas

Disturbed areas are common in the undeveloped regions between buildings and along roadsides in NRP and Ames Campus areas. Disturbed areas may exhibit altered topography resulting from past or present fill or excavation and are commonly covered with debris. These areas are significantly altered from their original habitat type; in many cases, they are almost bare or are dominated by

FIGURE 3.9-1

DISTRIBUTION OF VEGETATION AREAS



- Levee
- Open Water
- Estuarine Channel
- Coastal Salt Marsh
- Coyote Brush Scrub
- Disturbed
- Developed
- Fresh and Brackish Water Marsh
- Non-native Grassland
- Seasonal Salt Marsh and Transition
- Weed Dominated Area
- Golf Course
- Ditches
- Ames Research Center Property Boundary

N

0 76m 152m 305m

0 250ft 500ft 1000ft

Source: Jones & Stokes

ruderal species. Weedy species that may be found in this habitat type include the invasive exotic perennial pepperweed (*Lepidium latifolium*).

iii. Developed Areas

Developed areas include buildings and urban landscaping. Urban landscaping consists of ornamental trees, shrubs, and turf grasses that were intentionally planted around the buildings in the NRP area and in other parts of Ames Research Center. Most species are non-native and require irrigation and regular maintenance. Species planted in these areas include lawn grasses, juniper (*Juniperus* spp.), cypress (*Cypressus* spp.), and domestic roses (*Rosa* spp.).

iv. Special Status Plants

No special-status plants are known or expected to occur in the NRP and Ames Campus planning areas because of their highly urbanized nature.

b. Wildlife

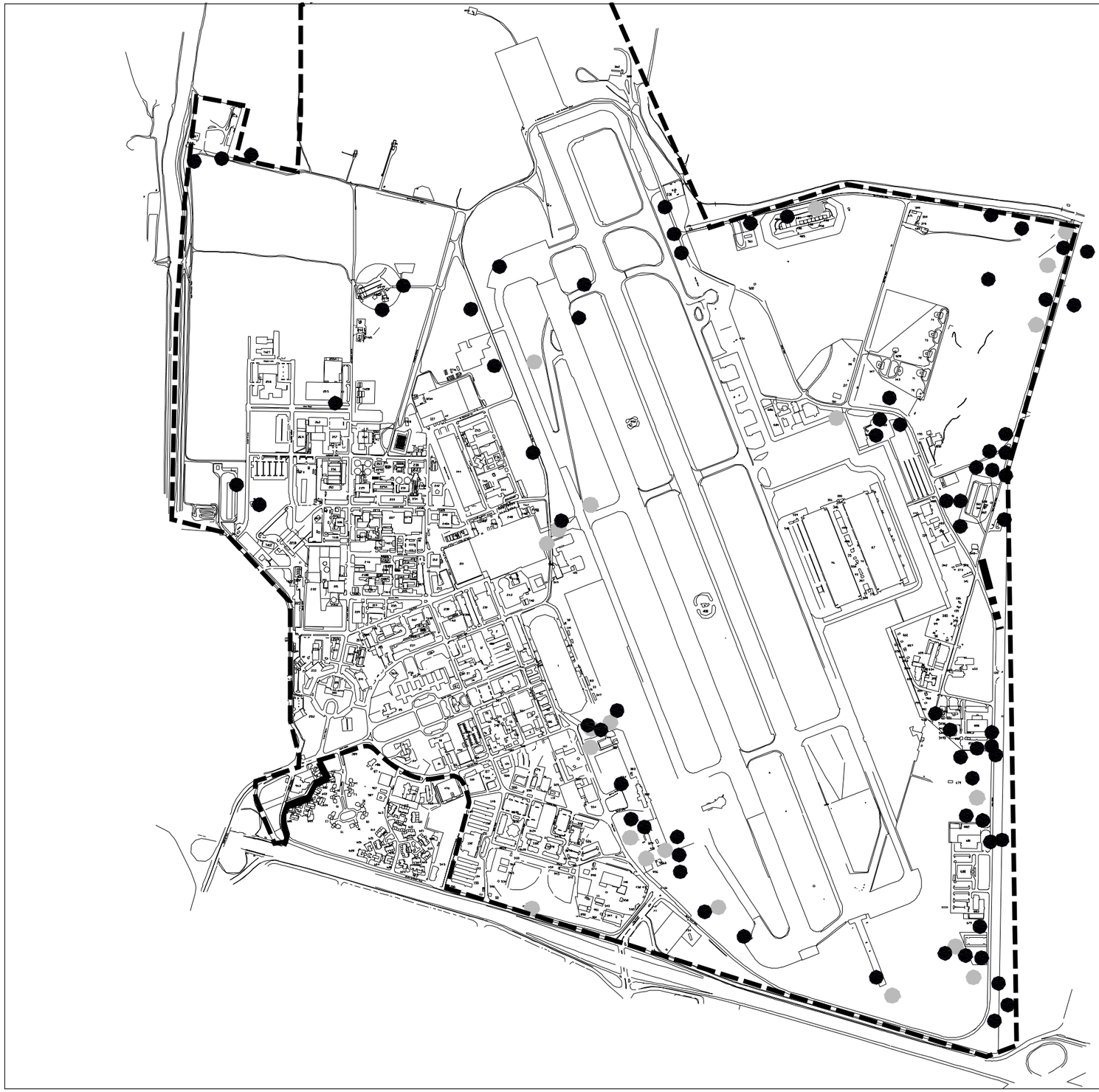
This section describes common and special status wildlife species found in the NRP and Ames Campus areas.

i. Common Species

The NRP and Ames Campus areas are highly urbanized and disturbed and offer little open habitat. Wildlife in these areas consists of species that are adaptable to human presence and disturbance, such as Mexican free-tail bats (*Tadarida brasiliensis*), skunks (*Mephitis mephitis*), raccoons (*Procyon lotor*), and opossums (*Didelphis virginiana*). Feral cats (*Felis catus*), which substantially disturb natural wildlife communities by predation, are also common. Small mammals such as California ground squirrels (*Spermophilus beecheyi*), western harvest mice (*Reithrodontomys megalotis*), deer mice (*Peromyscus maniculatus*), and house mice (*Mus musculus*) are abundant and provide a significant prey base for these predators. Ornamental trees and shrubs create habitat for common bird species such as European starling (*Sturnus vulgaris*), mourning dove (*Zenaida macroura*), Brewer's blackbird (*Euphagus cyanocephalus*), sparrow (*Zonotrichia* spp.), and house finch (*Carpodacus mexicanus*).

FIGURE 3.9-2

BURROWING OWL HABITAT



Active Owl Burrows, 2001

Historic Owl Burrows, January 1998- March 2001

Ames Research Center Property Boundary

N

0 69m 139m 277m

0 227ft 455ft 909ft

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

ii. Special-Status Animals

Because of these areas' highly urbanized nature, very few special-status animals are expected to occur in the NRP and Ames Campus planning areas. However, the western burrowing owl (*Athene cunicularia hypugea*), is known or expected to occur in open areas and road shoulders of the NRP and Ames Campus planning areas.

iii. Western Burrowing Owl

The locations of the burrowing owl nests at ARC in recent years are shown in Figure 3.9-2. Burrowing owls have been listed as a California Species of Concern since 1978, so direct impacts to either the birds or their nests are prohibited. In addition, the California Fish and Game Code prohibits the take, possession, or destruction of birds, their nests, or their eggs. Burrowing owls are also listed as a federal species of concern.

Burrowing owls are small brown and white mottled owls, with bright lemon-yellow eyes and long, unfeathered legs. They are approximately 18 to 25 cm (7 to 10 inches) tall, and weigh on average 80 to 110 grams (3 to 4 ounces). They range from Mexico to Canada. Of all of the 171 species of owls worldwide, the burrowing owl is the only one that nests underground.

Burrowing owls usually move into burrows that other animals have abandoned rather than digging their own, and thus almost always live within colonies of small burrowing animals. In Northern California, burrowing owls live primarily in ground squirrel colonies. They not only use burrows that ground squirrels have abandoned as nests, but also depend on the squirrels to graze down the vegetation around burrows to short grass or even dirt, which is the owl's preferred habitat.

Typical burrowing owl habitat is open, dry, sparsely vegetated terrain. The availability of burrows is the most critical element. Owls' choice of burrows is affected by several key factors, such as the percentage of vegetative cover and the

height of vegetation surrounding the burrow mouth, soil texture, and the presence of perches suitable for keeping watch for predators.

Historically, burrowing owls were found in natural areas of open prairie or open shrub-steppe habitat. Human population growth and land use changes have destroyed much of their original habitat; however, so burrowing owls now commonly nest in the perimeters of agricultural fields, irrigation ditches, fallow fields, open fields prepared for development, airports, golf courses, military bases, and parks. They have become tolerant of some human presence as long as suitable nesting and foraging habitat exist.

Some burrowing owls are migratory, while others live in roughly the same area all year round. Whether they migrate out or just move a small distance, burrowing owls often return to the same or nearby nest burrows each spring to breed. Once owls have chosen a nest burrow, they are loathe to leave it, which can make it very difficult to relocate them. All of the relocation attempts that have been studied during the nesting season have had low success rates. However, owls can be relocated outside of the breeding season if adequate burrows and suitable habitat are available on-site nearby.

Burrowing owls are active during both day and night. By day, they stand by their nest burrow guarding against predators. At night they apparently do most of their feeding. They prey primarily on large insects and small rodents.[6]

Burrowing owls forage in ruderal, manicured, or natural grasslands. While they do most of their foraging within 90 meters (300 feet) of their burrows, recent research also indicates that owls may forage as much as 5 kilometers (3 miles) from their burrows in the evening.[7]

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[6] Zarn, 1994.

[7] Personal communication with D. Rosenberg.

Burrowing owls are themselves prey for a number of aerial and ground species including hawks, falcons, coyotes, snakes, skunks, racoons, feral cats, and loose dogs. The major unnatural causes of death for owls include effects from pesticides, predation by non-native and feral animals, destruction of nests by surface disturbances such as grading, and collisions with cars since owls generally fly low to the ground.[8]

Currently, the western burrowing owl is declining throughout much of its western North American range. It is endangered in Minnesota, Iowa and throughout its range in Canada. It is a species of concern in six states, including California. The extensive destruction of prairie dogs and ground squirrels, whose colonies it usually shares, the use of pesticides and herbicides, and the conversion of grasslands to agricultural and urban uses have all contributed to the burrowing owl's declining numbers.[9]

The burrowing owl was once a relatively common grassland bird in California. Although owls still occur in much of their pre-1940s range in California, the species no longer breeds in Marin, San Francisco, Santa Cruz, Napa, coastal San Luis Obispo, or Ventura Counties. Only one to two breeding pairs each exist in Sonoma, Santa Barbara, Orange, coastal Monterey, and San Mateo Counties.[10]

The South San Francisco Bay region, which includes Santa Clara and Alameda Counties, lost a substantial portion of its owl population during the explosive development of the 1980s, and numbers are still declining. The region currently supports a population of approximately 120 breeding pairs of burrowing owls. Ames Research Center supports the largest subpopulation, with roughly 25 breeding pairs. The relatively large size of the Center's burrowing owl population makes it an anchor for the entire region. The survival of this

[8] Milsap and Bear, 1988 and Haug and Oliphant, 1990.

[9] Haug, et al., 1993 and Zarn, 1994.

[10] DeSante and Ruhlen, 1995.

population may thus be critical to the long-term persistence of burrowing owls in the region. The locations of recent burrowing owl nesting sites are shown in Figure 3.9-2. In addition to these nesting sites, owls use approximately 440 acres of grassland and 134 hectares (330 acres) of wetland areas at Ames Research Center for foraging.

Burrowing owls have thrived at Ames Research Center for four main reasons. First, Ames Research Center's federal ownership has largely protected the land from the rampant development that has destroyed much of the owl habitat in the rest of Santa Clara County. A second reason is that Ames Research Center is closed to the public, preventing much human disturbance of owl burrows and foraging areas. Thirdly, short grass habitat has been maintained as part of standard maintenance procedures. Finally, ground squirrels are not controlled throughout much of the undeveloped portions of Ames Research Center, which leaves burrowing owls their essential habitat requirements: ground squirrels and their burrows.

In order to protect the burrowing owl population at Ames Research Center, a Burrowing Owl Habitat Management Plan (BOHMP) has been prepared by Dr. Lynne Trulio, a burrowing owl expert. This report presents management techniques for protecting owls and owl habitat, reducing predation, and minimizing the impact of any new projects on Ames Research Center's owl population. The centerpiece of the BOHMP is the establishment of several burrowing owl nesting habitat preserves, together comprising approximately 33 hectares (81 acres). The recommendations of this report have been incorporated into the Preferred Alternative for the NASA Ames Development Plan. The BOHMP appears under separate cover as Appendix F.

iv. Bats

To date, no special status bat species have been found at Ames Research Center. However, special status bat species that may occur at Ames Research Center are described in Table 3.9-2. All of them are listed as special-status by either the federal or California agencies. Special status bats that may occur at Ames Research Campus (Table 3.9-2) are structure-roosters, meaning that they roost in

unoccupied areas of buildings and/or bridges in areas throughout central California. Roosts are used during the daytime and in winter for hibernating. At dusk, bats leave the roost to forage for insects in nearby wetland and riparian habitats. These roosting sites are very sensitive to human disturbance, especially when bats are hibernating or rearing young. Many bats roost in Buildings 19, 227 and others; however, based on observations by NASA wildlife staff, none are believed to be special status.

2. Bay View Area

The Bay View area is less developed than other parts of Ames Research Center, and as a result it supports more native habitat types. However, despite its more natural appearance, the Bay View area has been subject to agricultural disturbance, resulting in the development of non-native grasslands and weed dominated areas. For example, areas that now support coyote brush scrub and non-native grassland habitats were previously under dryland cultivation and were affected by farming practices, including disking and plowing, until the 1980s.[11] In addition, hydrologic alterations such as the construction of salt ponds, a stormwater retention pond, and levees and dikes, also caused permanent disturbance to this area.

a. Vegetation

Habitats in the Bay View area include: seasonal salt marsh and transition, coyote brush scrub, non-native grassland, weed-dominated areas, disturbed areas, and urban landscaped areas. Figure 3.9-1 shows the distribution of these habitat types.

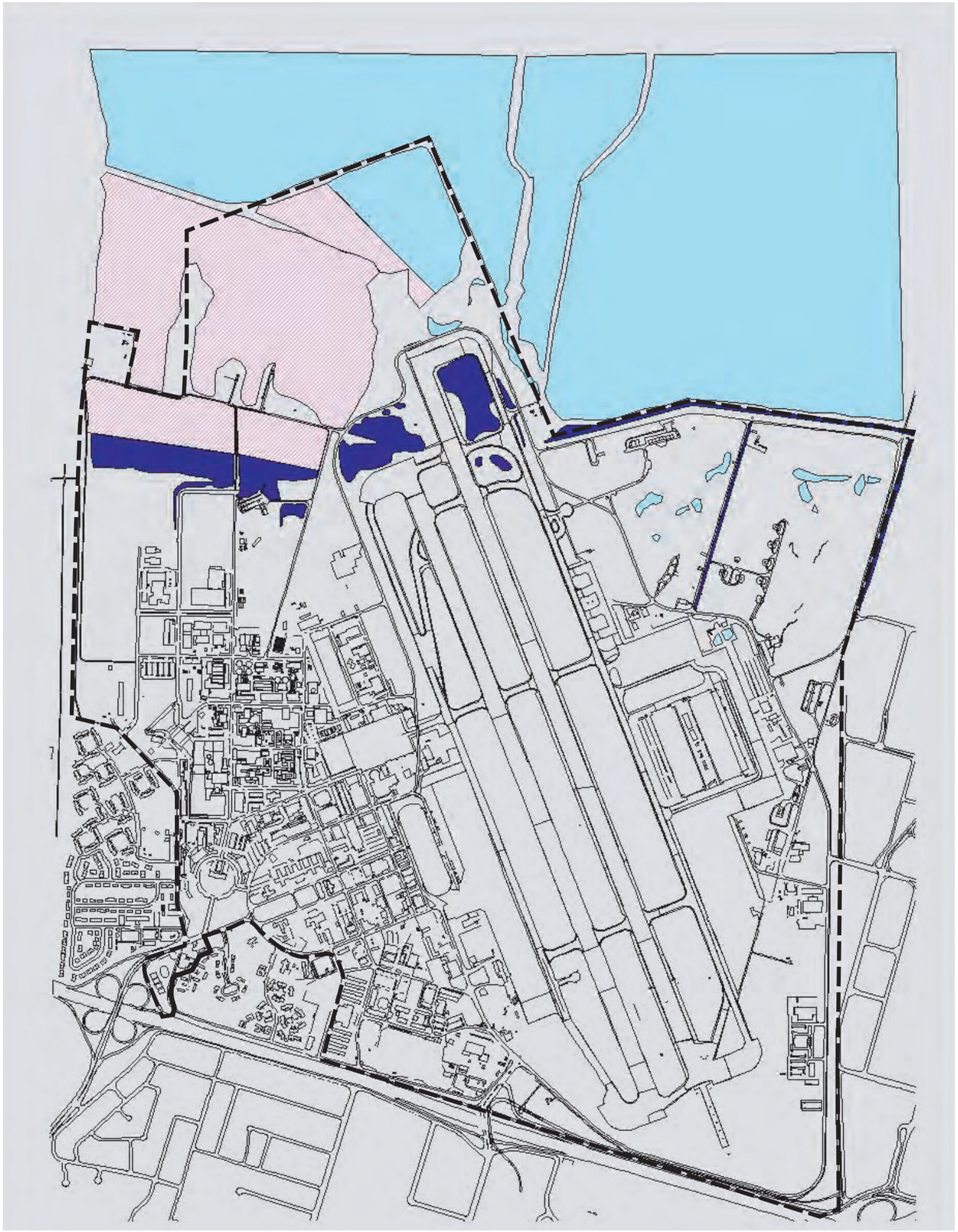
i. Seasonal Salt Marsh and Transition

Seasonal salt marsh is found in the wetlands in the North of the Bay View area, which is outside of the four planning areas and will not be developed under the

[11] Alderete, C. NASA Ames Research Center. Personal Communications. August and September 2000.

FIGURE 3.9-3

WETLAND AREAS



Source: Jones & Stokes

Wetlands and Waters of the U.S., verified by COE 1989
(Teesting, T.F. 1989. Army Corps of Engineers. Letter to Sandy Olliges)

Potential Wetlands and Waters of the U.S., (unverified).
(As identified in PRC Environmental Management, Inc. and Montgomery Watson. 1997 Moffett Inc. Federal Airfield, CA. Final Phase II, Site-Wide Environmental Assessment. Prepared for NASA Ames Research Center, Denver, CO.)

Wetlands and Waters of the U.S., verified by COE 2001
(Jones & Stokes. 2001. Preliminary delineation of Waters of the United States for Moffett Field, CA. May. Prepared for U.S. Army Corps of Engineers, San Francisco District, Regulatory Branch, San Francisco, CA. San Jose, CA)

Ames Research Center Property Boundary

N

0 76m 152m 305m

0 250ft 500ft 1000ft

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NADP, and along the border between these wetlands and the Bay View area (Figure 3.9-3). Only a very small extent of seasonal salt marsh and transitional habitat is actually within the Bay View area (approximately 2.1 hectares [5.3 acres]). Seasonal salt marsh occurs on the uppermost edges of coastal salt marsh habitats and includes vegetation that is transitional between the salt marsh and adjacent uplands or structural elements (e.g., roads, levees, dikes). At lower elevations, seasonal salt marsh is dominated by pickleweed (*Salicornia virginica*), alkali heath (*Frankenia salina*), and salt grass (*Distichlis spicata*). Black mustard (*Brassica nigra*) and Australian saltbush (*Atriplex semibaccata*) are present along berms and in other elevated areas. In some areas, perennial pepperweed may exceed 50 percent cover. Its presence indicates the displacement of native plant species and reduction in habitat value for wildlife.

ii. Coyote Brush Scrub

At Ames Research Center, areas of coyote brush scrub include regions that have been disturbed in the past or have been subjected to repeated disturbances over time. In the Bay View area, this habitat type occurs on the western boundary of the Center, along West Perimeter Road.

In coastal areas, coyote brush (*Baccharis pilularis*) is often one of the first native shrub species to colonize disturbed upland areas and sometimes forms dense stands. Dense stands of coyote brush are categorized as coyote brush scrub. The overstory of coyote brush scrub is dominated by coyote brush. The species composition of the herbaceous plants in the understory is similar to that of adjacent habitats (non-native grassland or weed-dominated areas). At Ames Research Center, other shrub and tree species were also observed in some stands of coyote brush scrub, including the native elderberry (*Sambucus mexicana*) and non-native ornamental olive (*Olea* spp.) and acacia (*Acacia* spp.).

iii. Non-Native Grassland

A large portion of the Bay View area along the west boundary of Ames Research Center (West Perimeter Road) is non-native grassland habitat. Areas classified as non-native grasslands are dominated by non-native grasses, including annual Mediterranean grasses such as Mediterranean rye (*Lolium multiflorum*), wild oats

(*Avena* spp.), bromes (*Bromus* spp.), and rattail fescue (*Vulpia myuros*). Another common species, creeping red fescue (*Festuca rubra*), is a non-native perennial grass. Non-native herbaceous species contribute less than 20 percent of vegetation cover in non-native grasslands; they include bristly ox-tongue, birdsfoot trefoil (*Lotus corniculatus*), field bindweed (*Convolvulus arvensis*), and milk thistle (*Silybum marianum*).

iv. Weed-Dominated Areas

The Bay View area supports weedy habitats similar to those in the NRP and Ames Campus planning areas. Weed-dominated habitats in the Bay View area occur along roadsides and in open spaces between development, and may also occur as patches enclosed by other habitat types. Some weed-dominated habitats in the Bay View area include areas where moist soil supports an increased diversity of non-native weedy species. In some locations, large stands of invasive exotic species such as kikuyu grass (*Pennisetum clandestinum*), periwinkle (*Vinca major*), and perennial pepperweed are present. Kikuyu grass is abundant on berms and roadsides adjacent to coastal salt marsh and freshwater and brackish marsh habitats. The presence of these species is notable because they are all highly invasive and have the potential to displace more desirable vegetation. If not controlled, these invasive species will continue to spread into surrounding habitats.

v. Other Habitat Types

Other habitat types are sparsely represented in the Bay View area. Because there has been little development in the area, currently disturbed areas are limited to a few empty lots between buildings. However, there is urban landscaping around the buildings in this area.

vi. Special-Status Plants

No special-status plants are known or expected to occur in the Bay View area because of its highly urbanized nature.

b. Wildlife

This section describes common and special status wildlife species in the Bay View area.

i. Common Species

The Bay View area supports a variety of wildlife. Common and dominant species include many birds that use coyote brush scrub, non-native grassland, and the willows in the wetter areas, such as song sparrow (*Melospiza melodia*), white-crowned sparrow (*Zonotrichia leucophrys*), golden-crowned sparrow (*Zonotrichia atriacapilla*), lesser goldfinch (*Carduelis psaltria*), American goldfinch (*Carduelis tristis*), Brewer's blackbird, western meadowlark (*Sturnella neglecta*), marsh wren (*Cistothorus palustris*), Bewick's wren (*Thryomanes bewickii*), and house finch. Raccoons, opossums, and skunks are common mammals in this area. Non-native red foxes (*Vulpes vulpes*) and feral cats are also seen. Small mammals supply an abundant prey base; they include burrowing species such as pocket gophers (*Thomomys bottae*) and larger lagomorphs such as black-tailed hares (*Lepus californicus*).

Because of the Bay View area's proximity to wetland and open water habitats, migratory waterfowl are present. Seasonal migrants to the diked marshes include: western gull (*Larus occidentalis*), American coot (*Fulica americana*), Canada goose (*Branta canadensis*), northern shoveler (*Anas clypeata*), mallard (*Anas platyrhynchos*), green-backed heron (*Butorides striatus*) and pied-billed grebe (*Podilymbus podiceps*). There is no open water in Bay View. Under the Mitigated Alternative 5, Bay View boundaries have been reduced to exclude all designated wetlands. (See Figure 2-6.)

ii. Special Status Animals

The following special-status animal species have been observed in the Bay View area.

— Salt Marsh Common Yellowthroat: The salt marsh common yellowthroat (*Geothlypis trichas sinuosa*) is a State species of special concern. It is a small warbler that resides in the marshes of the San Francisco Bay area. During

the breeding season (March to late July) it can be found in marshes from Sonoma, Napa, Solano, and Marin Counties south to Santa Clara County. This species uses both wetland and upland vegetation for foraging and nesting. Salt marsh common yellowthroats are rare in Ames Research Center, although they are observed in the freshwater and brackish marshes and adjacent habitats both within and north of the Bay View area.

- Loggerhead Shrike: The loggerhead shrike (*Lanius ludovicianus*) is a State and federal species of special concern. It is a common resident and winter visitor in lowlands and foothills throughout California and prefers open habitats offering scattered shrubs, trees, posts, fences, utility lines, or other perches. A small number of loggerhead shrikes have been observed in the Bay View area in the upland habitats adjacent to the freshwater and brackish marshes.

- White-Tailed Kite: White-tailed kites (*Elanus leucurus*)are fully protected under Section 3511 of the California Fish and Game Code. This species is a year-round resident of low rolling foothills and valley margins throughout California, and often forages for birds and small mammals in open grassland and marsh habitats. White-tailed kites are common at Ames Research Center. Individuals of the species have been observed in courtship behavior, indicating that breeding may occur on-site, and nests have been found in the north of Bay View area.

- Western Burrowing Owl: Tall grasslands preclude burrowing owls from nesting in the western Bay View area. However, burrowing owls have historically nested in the eastern portion of this parcel, near the Outdoor Aerodynamic Research Facility and the Vertical Take Off and Landing Facility, as shown in Figure 3.9-2. Owls can also be found in Shoreline Regional Park, to the west of ARC.

- Northern Harrier: Northern harriers (*Circus cyaneus*) are fully protected under Section 3511 of the California Fish and Game Code. They are fairly large raptors that occupy coastal salt and freshwater marshes. Northern

harriers often forage in grasslands and fields that surround the marsh north of the Bay View area, and they are seen regularly in the Bay View area.

- Golden Eagle: The golden eagle (*Aquila chrysaetos*) is a State species of special concern and is protected under the federal Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act. The golden eagle feeds mainly on rabbits and on California ground squirrels (*Spermophilus beecheyi*). Pairs typically nest on cliffs or in trees, preferably near grasslands where prey is available. Golden eagles have been observed in the Bay View area, and foraging habitat is available in the area's non-native grasslands and weed-dominated habitats.

- Horned Lark: The horned lark (*Eremophila alpestris aetia*) is a State species of special concern. Horned larks occur in open habitats with few trees. As a result they can utilize grazed prairies and meadows and can tolerate some human disturbances related to farming and clearing. A few horned larks have been observed in the Bay View area.

- American Peregrine Falcon: The American peregrine falcon (*Falco peregrinus anatum*) is State-listed as endangered. Peregrine falcons nest on ledges in tall vertical cliffs and other rocky outcrops secure from predators. The species forages on a variety of birds and small mammals in both terrestrial and wetland habitats. Suitable foraging habitat exists throughout the annual grasslands and weed-dominated portions of Ames Research Center. However, the Center does not offer suitable nesting habitat for the species, so the species is uncommon within it.

Surveys have concluded that the following special-status species do not occur in the Bay View area.

- Western Pond Turtle: The western pond turtle (*Clemmys marmorata*) is a State species of special concern. Pond turtles are found in quiet waters of lowland and foothill ponds, streams, marshes, and reservoirs. They require upland habitat for breeding. A pond turtle may travel long distances upslope

from a permanent or nearly permanent water source to lay its eggs in grassland or scrub habitat. Ames Research Center offers little habitat that is suitable for pond turtles. During a survey conducted in May 2002, the NASA wildlife biologist observed western pond turtles downstream and east of the Northern Channel, where it is pumped into Guadalupe slough within the Northern Channel, and within the Marriage Road ditch, which is in the Eastside/Airfield area.

— California Red-Legged Frog: The California red-legged frog is federally listed as threatened and is a State species of special concern. The species requires permanent or semi-permanent aquatic habitats with emergent and submergent vegetation. A red-legged frog survey was conducted in the north of Bay View and Eastside/Airfield areas in 2001.[12] The areas surveyed in the north of Bay View were the small portions of wetland near the Bay View planning area and the settling basin. No adult frogs or metamorphs were observed in either the north of Bay View or Eastside/Airfield areas.

The survey concluded that the presence of treefrog tadpoles in the settling basin indicates that it could provide potential breeding habitat for red-legged frogs. However, yearly maintenance activities such as draining the basin for sediment removal and an abundance of predators in and around the basin (i.e., mallards (*Anas platyrhynchos*) and cinnamon teal (*Anas cyanoptera*)) preclude this species from occurring there.

The survey surmized that no red-legged frogs were found in the marshes because they typically dry each year and the frogs cannot complete metamorphosis before this occurs. In addition, the isolation of ARC and the highly developed areas that surround the site have most likely caused the extirpation of the red-legged frog from this area some time ago.

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[12] Scott, N.J. and C. Alderete, *Amphibian Survey of Moffett Field, Santa Clara County, California, with Focus on the California Red-Legged Frog (Rana aurora draytonii) and the California Tiger Salamander (Ambystoma californiense)*, July 2001.

— California Tiger Salamander: The California tiger salamander is a candidate for federal listing and is a State species of special concern. Tiger salamanders are terrestrial and spend most of their time underground in small mammal burrows, emerging only for brief periods to breed. Breeding is known to occur in temporary pools and may also occur in more permanent bodies of water. California tiger salamander surveys were conducted concurrently with California red-legged frog surveys in 2001.[13] No California tiger salamander adults or larvae were found in the north of Bay View area (or in the Eastside/Airfield area).

The habitat requirements for the California tiger salamander are not present in the settling basin or wetlands in this north of Bay View area. In addition, the presence of predators and a relatively low density of ground squirrel burrows in the north of Bay View area preclude this species from occurring there.

3. Eastside/Airfield

The majority of the Eastside/Airfield area is occupied by the airfield and its accompanying hangars and support buildings. Other land uses in the area include office buildings and the golf course.

a. Vegetation

Habitats in the Eastside/Airfield area include estuarine channel, ditches, golf course, non-native grassland, weed-dominated areas and disturbed areas.

i. Estuarine Channel

The Northern Channel is a storm drain channel that contains shallow water habitats that exhibit estuarine characteristics. The Channel runs along the northern boundary of the Eastside/Airfield area, and is separated from the North Patrol Road by an armored chain link fence. The Northern Channel's saltwater influx is likely contributed by the Cargill Salt Ponds, and becomes seasonally

[13] Scott and Alderete, 2001, op. cit.

diluted by freshwater runoff that enters the Channel. The Channel's shore supports emergent hydrophytic vegetation that provides habitat for a variety of waterbirds, including salt marsh yellowthroat and common moorhen. The Channel also supports several fish and invertebrate species, including bay shrimp, crabs, mosquitofish, and longjaw mudsuckers. Freshwater gastropod shells have been found in the Channel, suggesting that the winter influx of fresh water supports populations of snails.[14]

ii. Ditches

In the Eastside/Airfield area, wetland habitats are found in ditches that run parallel to roads in and around the golf course. The habitats associated with wetlands vary by location. The Marriage Road ditch is seasonally wet and supports freshwater species, while the North and East Patrol Road ditches are more saline and support species more typical of a salt marsh.

The Marriage Road ditch is low in elevation and located near salt water, so the water that seasonally ponds there may be somewhat brackish or alkaline. Vegetation in this habitat type is a mosaic of patches of baltic rush (*Juncus balticus*), creeping wild rye (*Leymus triticoides*), and cattails (*Typha* spp.) Other species include spearscale (*Atriplex triangularis*), salt grass, clustered field sedge (*Carex praegracilis*), and non-native perennial pepperweed.

The ditches located along East Patrol Road and North Patrol Road represent a unique habitat because of their steep banks and the long-term availability of water. Their structure supports the development of several narrow, linear vegetation zones adjacent to one another. The ditch along North Patrol Road has steep banks and wetland vegetation is limited to the lower portions of the banks, immediately above the water line. The dominant plant species in the wetland portions of the North Patrol Road ditch include pickleweed, salt grass, and prairie bulrush (*Scirpus maritimus*). Adjacent uplands support the non-native

[14] *Moffett Federal Airfield Remedial Investigation/Feasibility Study, Final Phase II Site-Wide Ecological Assessment Report*, prepared by Montgomery Watson for the Naval Facilities Engineering Command. 1997.

herbaceous species birdsfoot trefoil and yellow sweet clover (*Melilotus inducus*) and the non-native grasses rattail fescue and Mediterranean canary grass (*Phalaris minor*). Cattails and bulrushes (*Scirpus* spp.) form patches of emergent vegetation.

The ditch along the East Patrol Road is slightly wider and has more gently sloping banks than the North Patrol Road ditch. During the field surveys in August and September 2000, surface water was present only in a ponded area at the northern end of the ditch. The East Patrol Road ditch supports much less vegetation than the North Patrol Road ditch, and is dominated by non-native dallis grass (*Paspalum dilatum*) and litter, with a few stands of prairie bulrush.

iii. Golf Course

The golf course provides irrigated, grassy, open habitat for small mammals and the predators that prey on them. Both California ground squirrels and burrowing owls are numerous. The golf course also encompasses permanent ponds and stormwater runoff ditches that are supplied with brackish water.

iv. Other Habitat Types

Non-native grasslands, weed-dominated areas, and disturbed areas are also present in the Eastside/Airfield area. They occur between developed parcels, along roads, and in open fields.

v. Special-Status Plants

No special-status plants are known or expected to occur in the Eastside/Airfield area because of its highly urbanized nature.

b. Wildlife

This section describes common and special status wildlife species found in the Eastside/Airfield area.

i. Common Species

Common and dominant wildlife species that occur in the Eastside/Airfield area are similar to those found in the NRP and Ames Campus areas. In addition, the

migratory waterfowl present in the Bay View area also utilize the seasonal wetlands in the northern portion of the airfield when enough rain falls to fill them. The prey base of small mammals (i.e., California ground squirrels (*Spermophilus beecheyi)*) in the Eastside/Airfield is large, and many raptors have been seen hunting here, including the peregrine falcon (*Falco peregrinus anatum*), golden eagle (*Aquila chrysaetos*), and white-tailed kite (*Elanus leucurus*).

ii. Special-Status Animals

The following special-status animal species occur or may occur in the Eastside/Airfield area.

- Western Burrowing Owl: Because of the large population of California ground squirrels, burrowing owls are common in the Eastside/Airfield area and on the Lockheed property to the east of Ames Research Center.

- Bat Species: Although unlikely, the buildings on the Eastside/Airfield may provide habitat for structure-roosting bats. No special-status bats have been observed at NASA Ames Research Center. In addition, the wetlands in Eastside/Airfield may provide foraging habitat for all bat species that may occur in the vicinity (Table 3.9-2).
- Western Pond Turtle: One western pond turtle has been observed in the Marriage Road Ditch in the Eastside/Airfield, and several have been observed in the Northern Channel, which is north of, and adjacent to, the Eastside/Airfield area.

Surveys have concluded that the following special-status species do not occur in the Eastside/Airfield area.

- California Red-Legged Frog: A recent survey for red-legged frogs[15] included the Eastside/Airfield area. No adults or metamorphs were found. A

[15] Scott and Alderete, 2001, op. cit.

previous survey of this area[16] also did not detect adults or larvae. There is almost no habitat in this planning area suitable for red-legged frogs, primarily due to high water salinities)[17]. Salinities in the ponds and ditches near the golf course are normally within the lethal range for developing red-legged frog embryos and larvae. Water in Marriage Road Ditch, adjacent to the golf course, could be suitable for red-legged frogs. However, the ditch is probably too narrow and the water too shallow for much successful reproduction.[18] Because of the lack of suitable habitat and the presence of aquatic and terrestrial predators, California red-legged frogs are considered extremely unlikely to occur in the Eastside/Airfield area.

— California Tiger Salamander: California tiger salamander surveys in the Eastside/Airfield area were conducted concurrently with the California red-legged frog surveys in 2001[19] and 1994.[20] No California adults or larvae were found during either survey.

4. North of Bay View Area

Immediately north of the Bay View area is a tract of high-quality wetland habitat that is rich in vegetation and wildlife. This region, referred to as the North of Bay View area, is within Ames Research Center jurisdiction but has been excluded from the proposed action area because of the special-status species it supports or may support, and because of the presence of jurisdictional wetlands. It is discussed here because of its proximity to the Bay View area and the potential that it may be indirectly impacted by nearby activities related to the proposed action.

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[16] V.L. Layne and E.K. Harding-Smith, 1995, *Sensitive Species at Moffett Field*.

[17] Scott and Alderete, 2001, op. cit.

[18] Ibid.

[19] Ibid.

[20] V.L. Layne and E.K. Harding-Smith, 1995, op. cit.

The North of Bay View wetland area contains the most diverse and least disturbed habitats at Ames Research Center, including: coastal salt marsh, seasonal salt marsh and transition, freshwater and brackish marshes, coyote brush scrub, unvegetated areas (including open water), and disturbed areas. Habitat suitable for many special-status plants and wildlife occur or may occur in the North of Bay View area. Bats may forage on insect populations that are provided by the wetland habitats in the North of Bay View area. Surveys have been conducted for delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), hairless popcornflower (*Plagiobothrys glaber*), Point Reyes bird's beak (*Cordylanthus maritimus* ssp. *palustris*), and California sea-blite (*Suaeda californica*), California red-legged frog (*Rana aurora draytonii*), and California tiger salamander (*Ambystoma californiense*). To date, none of these species have been observed. High water salinities, seasonal drying, and the presence of predators preclude the existence of red-legged frogs and tiger salamanders in the North of Bay View area.

However, surveys have documented the presence of many special-status wildlife species, including: salt marsh harvest mouse (*Reithrodontomys raviventris raviventris*), California brown pelican (*Pelecanus occidentalis*), California clapper rail (*Rallus longirostris obsoletus*), California least tern (*Sterna antillarum browni*), western burrowing owl, golden eagle, loggerhead shrike, northern harrier, peregrine falcon, salt marsh common yellowthroat, western snowy plover (*Charadrius alexandrinus nivosus*), and white-tailed kite. Special-status species that have not been recorded, but for which suitable habitat is present, include: Alameda song sparrow (*Melospiza melodia pusillula*),blackbird (*Agelaius tricolor*), western least bittern (*Ixobrychus exilis hesperis*), salt marsh wandering shrew (*Sorex vagrans haliocoetes*), and bald eagle (*Haliaeetus leucocephalus*).

E. Existing Indirect Impacts on Biological Resources

1. Eastern Diked Marsh

In the early 1990s, a sedimentation basin was installed upstream of the Eastern Diked Marsh (EDM) to remove contaminants from stormwater before it enters the EDM and the Stormwater Retention Pond (SWRP). The location of these

areas are shown in Figure 1-3. Prior to this, much of the stormwater that now flows through the sedimentation basin and the EDM was discharged through the northwest corner of the EDM directly to the SWRP. In addition to the stormwater discharges, in 1998 the U.S. Navy began discharging treated groundwater to the sedimentation basin and the EDM. Comparisons of aerial photographs from the early 1990s and vegetation maps from 1995[21] and 1999,[22] indicate that these additional freshwater flows to the EDM have substantially altered the vegetation community. In particular, SAIC's 1999 study noted that patches of freshwater cattails greatly increased in size between their field investigations in 1999 and the vegetation mapped in this area by Layne and Harding-Smith in 1995.

2. Indirect Impacts on Wildlife

Under existing conditions, ongoing activities at Ames Research Center probably disturb some special-status wildlife. For example, western burrowing owls may be disturbed by foot and vehicle traffic and by routine maintenance activities. In addition, people frequently walk on the trails surrounding the seasonal marsh and transition habitats in the North of Bay View area. This activity would continue under the No Action Alternative, and may continue to create a slight disturbance for some special-status wildlife species (e.g., salt marsh common yellowthroat) that occupy this habitat. However, this use has been ongoing for many years; and wildlife may have grown accustomed to this minimal disturbance.

NASA periodically conducts aerodynamic testing at the Outdoor Aerodynamic Research Facility (OARF) in the Bay View area. This facility is in close proximity to the wetlands and wildlife habitat in the North of Bay View area. The environmental impacts of the extreme noise generated by these tests were evaluated in the NASA Ames Aerodynamics Testing Program EIS, which concluded that California brown pelicans, California least terns, western snowy plovers, American peregrine falcons, northern harriers, and golden eagles were

[21] Layne and Harding-Smith, 1995.

[22] SAIC, 1999.

unlikely to experience significant noise-related impacts as a result of testing activities because these species do not breed on-site and alternative habitats are locally available.[23] In addition, upcoming testing activities are not expected to adversely affect areas that contain suitable habitat for California clapper rails or salt marsh harvest mice.[24] However, western burrowing owls may be exposed to noise levels in excess of 90 decibels, which could lead to hearing loss and disruption of breeding.

Non-native predators such as feral cats are common throughout Ames Research Center, in part because unauthorized feeding stations have been established. The feeding stations provide supplemental food for such predators, increasing their chance of survival during droughts and other periods when their main wild food source is scarce. Non-native predators such as feral cats prey on native insects, birds, and small mammals, including sensitive species found throughout Ames Research Center. They probably have the greatest impact on local populations of ground-nesting birds. Special-status ground-dwelling birds like the California least tern, California clapper rail, western burrowing owl, and western snowy plover are at particular risk from these non-native predators. Other special-status birds that may be adversely affected include the Alameda song sparrow, loggerhead shrike, and salt marsh common yellowthroat.

[23] National Aeronautics and Space Administration. *NASA Ames Aerodynamics Testing Program, Final Environmental Impact Statement*. October 1998.

[24] USFWS, letter to Chris Alderete, March 24, 2000.

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TABLE 3.9-1: **SPECIAL-STATUS PLANT SPECIES THAT OCCUR OR MAY OCCUR AT AMES RESEARCH CENTER**

Common Name Scientific Name	Status* Fed/State/ CNPS	California Distribution (Counties)	Habitats	Flowering Period	Potential for Occurrence in Moffett Field Study Area
Alkali milk vetch *Astragalus tener* var. *tener*	–/–/1B	Merced, Napa, Solano, and Yolo; presumed extirpated in Alameda, Contra Costa, Monterey, San Benito, San Francisco, San Joaquin, Santa Clara, Sonoma, and Stanislaus.	Playas, alkaline valley and foothill grasslands (on adobe clay substrate), alkaline vernal pools. Elevation: 1–60 m.	March–June	No records of species in study area. No suitable habitat exists in the study area.
California sea-blite *Suaeda californica*	E/–/1B	San Luis Obispo; presumed extirpated in Alameda and Santa Clara.	Coastal marshes. Elevation: 0–5 m.	July–October	No records of species in study area. Highly unlikely to occur; thought to be extirpated from San Francisco Bay area.
Caper-fruited tropidocarpum *Tropidocarpum capparideum*	SOC/–/1A	Presumed extinct (presumed extirpated in Alameda, Contra Costa, Glenn, Monterey, Santa Clara, and San Joaquin).	Alkaline valley and foothill grasslands. Elevation: 1–455 m.	March–April	No records of species in study area. Highly unlikely to occur; presumed extinct.
Congdon's tarplant *Hemizonia parryi* ssp. *congdonii*	SOC/–/1B	Alameda, Contra Costa, Monterey, San Luis Obispo, and Santa Clara; presumed extirpated in Santa Cruz and Solano.	Alkaline soils of valley and foothill grasslands. Elevation: 1–215 m.	June–November	No records of species in study area. No suitable habitat exists in the study area.
Contra Costa goldfields *Lasthenia conjugens*	E/–/1B	Alameda, Contra Costa, Monterey, Napa, and Solano; presumed extirpated in Mendocino, Santa Barbara, and Santa Clara.	Cismontane woodlands, alkaline playas, alkaline valley and foothill grasslands, mesic vernal pools. Elevation: 0–470 m.	March–June	No records of species in study area. Suitable habitat is sparse or absent; species is unlikely to occur in study area.
Delta tule pea *Lathyrus jepsonii* var. *jepsonii*	SOC/–/1B	Alameda, Contra Costa, Fresno, Marin, Napa, Sacramento, San Benito, Santa Clara, San Joaquin, and Solano.	Fresh and brackish marshes. Elevation: 0–4 m.	May–September	No records of species in study area. Suitable habitat may be present.

Common Name Scientific Name	Status* Fed/State/ CNPS	California Distribution (Counties)	Habitats	Flowering Period	Potential for Occurrence in Moffett Field Study Area
Hairless popcornflower *Plagiobothrys glaber*	–/–/1A	Presumed extinct (presumed extirpated in Alameda, Marin, Merced, San Benito, and Santa Clara).	Alkaline meadows, coastal marshes. Elevation: 15–180 m.	March–May	No records of species in study area. Highly unlikely to occur; presumed extinct.
Point Reyes bird's beak *Cordylanthus maritimus* ssp. *palustris*	SOC/–/1B	Humboldt, Marin, and Sonoma; presumed extirpated in Alameda, San Mateo, and Santa Clara.	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub. Elevation: 5–550 m.	June–October	No records of species in study area. Suitable habitat is present in salt and brackish marshes in study area.
Robust spineflower *Chorizanthe robusta* var. *robusta*	SOC/–/1B	Marin, San Francisco, San Mateo, Santa Clara and Sonoma; presumed extirpated in Alameda.	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub. Elevation: 5–550 m.	May–September	No records of species in study area. Suitable habitat may be present. Highly unlikely to occur; thought to be extirpated from San Francisco Bay area.
San Francisco Bay spineflower *Chorizanthe cuspidata* var. *cuspidata*	SOC/–/1B	Marin, San Francisco, San Mateo, Santa Clara and Sonoma; presumed extirpated in Alameda.	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub. Elevation: 5–550 m.	April–August	No records of species in study area. Suitable habitat is sparse or absent; species is unlikely to occur in study area.
San Joaquin spearscale *Atriplex joaquiniana*	SOC/–/1B	Alameda, Contra Costa, Glenn, Merced, Monterey, Napa, Sacramento, San Benito, Solano, and Yolo; presumed extirpated in San Joaquin, Santa Clara, and Tulare.	Chenopod scrub, meadows, playas, alkaline valley and foothill grasslands. Elevation: 1–320 m.	April–October	No records of species in study area. Suitable habitat is sparse or absent; species is unlikely to occur in study area.

*Status Explanations

Federal Status:
SOC = species of concern
E = listed as endangered under the Federal Endangered Species Act
T = listed as threatened under the Federal Endangered Species Act
– = no designation

State Status:
E = listed as endangered under the California Endangered Species Act
T = listed as threatened under the California Endangered Species Act
CR = listed as rare under the California Endangered Species Act
– = no designation

TABLE 3.9-2: **SPECIAL-STATUS ANIMAL SPECIES THAT OCCUR OR MAY OCCUR AT AMES RESEARCH CENTER**

Common Name *Scientific Name*	Status* Fed/State	California Distribution	Habitats	Reason for Decline/Concern	Potential for Occurrence in Moffett Field Study Area
Invertebrates					
Vernal pool fairy shrimp *Branchinecta lynchi*	T/–	Vernal pools and seasonal wetlands of the Central Valley.	Vernal pools and other seasonal aquatic habitats.	Habitat loss as a result of dredging and filling; poor water quality.	No recorded observations in study area. Study area is likely outside range of species.
Bay checkerspot butterfly *Euphydryas editha bayensis*	T/–	Lowlands of Santa Clara, San Mateo, Alameda, Contra Costa, and San Francisco Counties, on serpentine soils.	Serpentine soil outcrops that support host plants (*Plantago erecta, Castilleja densiflorus, and Castilleja exserta*).	Habitat loss as a result of urbanization and fragmentation.	No suitable habitat is present in the study area.
Amphibians					
California red-legged frog *Rana aurora draytonii*	T/SSC	Coast and coastal mountain ranges of California from Humboldt County south to San Diego County; Sierra Nevada (above 1,000 feet) from Butte to Fresno County.	Permanent and semipermanent aquatic habitats (such as creeks and coldwater ponds) with emergent and submergent vegetation and riparian species along the edges; may estivate in rodent burrows or cracks during dry periods.	Alteration of stream and wetland habitats; historical overharvesting; habitat destruction; competition and predation by non-native fish and bullfrogs.	No recorded observations in study area (Layne and Harding-Smith, 1995 and Scott and Alderete, 2001). Unlikely to occur in study area because no suitable habitat exists: water sources are saline and/or seasonal, and water quality is low. Predators are abundant.

Common Name *Scientific Name*	Status* Fed/State	California Distribution	Habitats	Reason for Decline/Concern	Potential for Occurrence in Moffett Field Study Area
California tiger salamander *Ambystoma californiense*	C/SSC	Central Valley, including Sierra Nevada foothills to elevations of approximately 1,000 feet; coastal region from Butte County south to Santa Barbara County.	Larvae use small ponds, lakes, or vernal pools in grasslands and oak woodlands; adults use rodent burrows, rock crevices, or fallen logs for cover and for estivation.	Loss of grasslands, vernal pools, and other wetlands as a result of agricultural development and urbanization.	No recorded observations in study area (Layne and Harding-Smith, 1995 and Scott and Alderete, 2001). Unlikely to occur in study area because no suitable habitat exists: water sources are saline and/or seasonal, and water quality is low. Predators are abundant.
Western spadefoot *Scaphiopus hammondii*	SC/SSC	Sierra Nevada foothills; Central Valley; Coast Ranges; coastal counties in southern California.	Shallow streams with riffles; seasonal wetlands such as vernal pools in annual grasslands and oak woodlands.	Alteration of stream habitats by urbanization and hydroelectric projects; loss of seasonal wetlands and vernal pools.	No recorded observations in study area. No suitable habitat is present, and study area is likely outside range of species.
Reptiles					
Alameda whipsnake *Masticophis lateralis euryxanthus*	T/T	Valleys, foothills, and low mountains in Alameda and Contra Costa Counties.	Oak woodland, northern coastal scrub, or chaparral; requires rock outcrops for cover and foraging.	Limited range and restricted habitat; habitat loss as a result of urban development; predation by domestic and feral cats.	No recorded observations in study area. Study area is likely outside range of species.
California horned lizard *Phrynosoma coronatum frontale*	SC/B	Lowlands throughout California.	Sandy washes with open areas for sunning, bushes for cover, and loose soil for burrowing; near abundant food sources (ants and other insects).	Urban encroachment on habitat.	Not observed in study area; suitable habitat is sparse or absent. Nearest recorded observation was on Mt. Hamilton.

Common Name *Scientific Name*	Status* Fed/State	California Distribution	Habitats	Reason for Decline/Concern	Potential for Occurrence in Moffett Field Study Area
Western pond turtle *Clemmys marmorata*	SC/SSC	West of the Sierra-Cascade crest from sea level to elevations of approximately 6,000 feet.	Woodlands, grasslands, and open forests; occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and vegetation to provide cover and food.	Loss and alteration of aquatic and wetland habitats; habitat fragmentation.	Four turtles have been observed in the Northern Channel and one has been observed in the Marriage Road Ditch in Eastside/Airfield.
Birds					
Alameda song sparrow *Melospiza melodia pusillula*	B/SSC	Southern San Francisco Bay area.	Forages and takes cover in taller vegetation along tidal sloughs; breeds in salt marshes.	Habitat loss resulting from dredging, diking, and filling of marsh habitats.	May occur in the study area in wetlands in North of Bay View area (outside of planning areas). Difficult to distinguish from other subspecies that occur in the area.
Bald eagle *Haliaeetus leucocephalus*	T(PR)/E	Year-round resident of mountain regions of northern California; winters throughout the state except for southern high-desert regions and parts of central inland California.	Uses ocean shorelines, lake margins, and rivercourses for nesting and foraging. Colonial nester; requires large or old-growth trees. Commonly nests in ponderosa pines.	Habitat loss as a result of urbanization.	May occur in study area. Nearest recorded observation was at Guadalupe River, foraging in summer and fall.

Common Name *Scientific Name*	Status* Fed/State	California Distribution	Habitats	Reason for Decline/Concern	Potential for Occurrence in Moffett Field Study Area
Bank swallow *Riparia riparia*	B/T	Resident in riparian and coastal settings in northern and northeastern California; migrant throughout the state. Only remaining resident coastal colonies in the state are located at Fort Funston and Point Año Nuevo.	Coastals cliffs, inland bluffs and riverbanks; prefers riparian and other lowland habitats; usually found along aquatic habitat. Colonial nester; requires vertical banks with soft substrate for digging nest sites.	Habitat loss as a result of urbanization.	No records of species in study area. Rarely observed in South San Francisco Bay area.
Western burrowing owl *Athene cunicularia hypugea*	SC/SSC	Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along the south coast.	Uses rodent burrows in sparse grassland, desert, and agricultural habitats.	Habitat loss; human disturbance at nesting burrows.	Many nests have been recorded in upland habitats of the study area, (within planning areas).
California brown pelican *Pelecanus occidentalis*	E/E	Along the coast from British Columbia to Central America. Breeding populations in Monterey County.	Coastal areas; on rocky shores and cliffs, in sloughs, and in coastal river deltas. Occasionally in inland lakes.	DDT contamination; overfishing of prey fish; human development around breeding and foraging habitat.	Non-breeding foragers observed in wetlands in North of Bay View area (outside of planning areas); also roosts on pond levees.
California clapper rail *Rallus longirostris obsoletus*	E/T	Salt and brackish marshes along San Francisco Bay.	Salt marshes with multiple tidal channels and vegetation dominated by cordgrass, pickleweed, and marsh gumplant.	Habitat loss and alteration as a result of filling, diking, and dredging.	Observed along Stevens Creek tidal slough (outside planning areas) and in North of Bay View.

Common Name *Scientific Name*	Status* Fed/State	California Distribution	Habitats	Reason for Decline/Concern	Potential for Occurrence in Moffett Field Study Area
California least tern *Sterna antillarum browni*	E/E	Nests in San Francisco Bay and in coastal areas from San Luis Obispo County south to San Diego County. Largest concentrations of breeding pairs nest in Los Angeles, Orange, and San Diego Counties. Sometimes seen around Salton Sea.	Sandy areas with sparse vegetation; mud flats; gravel substrates above high water.	Habitat loss as a result of human encroachment; predation; dredging, filling, and pollution of estuarine habitats.	Observed foraging and roosting in wetlands in North of Bay View area (outside of planning areas). May also nest onsite.
Cooper's hawk *Accipiter cooperii*	B/SSC	Throughout California except at high elevations in the Sierra Nevada. Wintering populations use the Central Valley, the southeastern desert regions, and the plains east of the Cascade Range.	Nests primarily in riparian forests dominated by deciduous species; also nests in densely canopied forests from foothill pine-oak woodland up to ponderosa pine; forages in open woodlands.	Human disturbance at nest sites; loss of riparian habitats, especially in the Central Valley; pesticide contamination.	No recorded observations in the study area. Suitable habitat is sparse or absent.
Golden eagle *Aquila chrysaetos*	PR/SSC	Foothills and mountains throughout California; uncommon non-breeding visitor to the lowlands, including the Central Valley.	Nests in cliffs and escarpments or in tall trees; forages in annual grasslands, chaparral, and oak woodlands with plentiful medium-sized and large mammals for prey.	Habitat loss as a result of urbanization.	Has been observed in the study area. Grasslands onsite may provide suitable foraging habitat.
Loggerhead shrike *Lanius ludovicianus*	B/SSC	Grasslands throughout the state.	Forages in grassland or ruderal habitats.	Loss of grassland habitat as a result of urban expansion.	Foraging behavior and nest sites have been documented in wetlands in North of Bay View area (outside of planning areas). May occur in similar habitats within planning areas.

Common Name *Scientific Name*	Status* Fed/State	California Distribution	Habitats	Reason for Decline/Concern	Potential for Occurrence in Moffett Field Study Area
Northern harrier *Circus cyaneus*	B/SSC	Marshes, fields, grasslands, and prairies throughout North America.	Coastal salt and freshwater marshes. Nests on ground in shrubby vegetation, usually near marsh edge or in grasslands; forages in grasslands.	Habitat loss as a result of urbanization and agricultural development; pesticide contamination.	Observed in wetlands in North of Bay View area (outside of planning areas).
American peregrine falcon *Falco peregrinus anatum*	delisted/E	In California, breeding range now includes the Klamath and Cascade ranges, the inland north-coastal mountains, the Sierra Nevada, and the Channel Islands.	Wetlands, grasslands, and tundra, in open forest, and in mountains. Prefers sites near open areas but with nearby cliffs for nesting and roosting; will occasionally nest on the ledges of tall buildings or bridges in cities.	Pesticide contamination; robbing of eyries by falconers; illegal shooting; human disturbance at nest sites.	May occur in study area. Foraging habitat is present but no suitable nesting habitat exists in the study area.
Salt marsh common yellowthroat *Geothlypis trichas sinuosa*	B/SSC	Fresh and brackish marshes of the San Francisco Bay Area.	Freshwater and brackish marshes with emergent vegetation.	Habitat loss resulting from dredging, diking, and filling of marsh habitats.	Foraging and nesting sites have been documented in wetlands in North of Bay View area (outside of planning areas).
Tricolored blackbird *Agelaius tricolor*	SC/B	From southern Oregon south through California's Central Valley and into Baja California.	Cattail and tule marshes; open valleys and foothills.	Habitat loss resulting from dredging, diking, and filling of marsh habitats.	May occur in wetlands in North of Bay View area (outside of planning areas). Nearest observations are near the Guadalupe River.

Common Name *Scientific Name*	Status* Fed/State	California Distribution	Habitats	Reason for Decline/Concern	Potential for Occurrence in Moffett Field Study Area
Western least bittern *Ixobrychus exilis hesperis*	SC/B	Breeds in parts of the Central Valley and inland northern California. Resident populations occur on the southernmost coast and from the Salton Trough and lower Colorado River regions south into Baja California and mainland Mexico.	Freshwater and brackish marshes with dense, tall aquatic or semi-aquatic vegetation. Colonial nester; nests in low tules, over water.	Habitat loss as a result of urbanization.	No records of species in study area; species is a rare visitor to nearby marshes in winter.
Western snowy plover *Charadrius alexandrinus nivosus*	T/SSC	Beaches and coastal settings from southern Washington to southern Baja California, and some inland playa lakes, primarily in California.	Sandy coastal beaches and margins of inland playas; prefers flat, bare or sparsely vegetated substrates, particularly light-colored substrates.	Human disturbance; habitat loss.	Observed foraging in wetlands in North of Bay View area (outside of planning areas).
White-faced ibis *Plegadis chihi*	B/SSC	Year-round resident of Salton Trough; winters in parts of Central Valley, on the south coast, and from the lower Colorado River region south into coastal mainland Mexico.	Shallow freshwater marshes offering dense tule thickets for nesting and areas of shallow water for foraging.	Decline of suitable habitat.	No records of species in study area. Rare migrant or winter visitor in the San Francisco Bay area.
Marbled murrelet *Brachyramphus marmoratus*	T/E	Marine subtidal and pelagic habitats and coastal coniferous forests from the Oregon border to Imperial Beach, San Diego County.	Old-growth conifer (especially redwood and Douglas-fir) forests near the coast.	Habitat loss resulting from logging of old-growth forests; loss of individuals from oil spills and other contaminants.	No suitable habitat is present in study area.

Common Name *Scientific Name*	Status* Fed/State	California Distribution	Habitats	Reason for Decline/Concern	Potential for Occurrence in Moffett Field Study Area
California black rail *Laterallis jamaicensis coturniculus*	T/–	San Francisco Bay area, Sacramento-San Joaquin delta, coastal southern California (including Morro Bay), Salton Sea, and Lower Colorado River area.	Saline, brackish, and freshwater emergent wetlands.	Significant loss of salt and freshwater wetland habitat. Loss of higher-elevation wetlands around San Francisco Bay has eliminated breeding in the area.	Suitable habitat is present in North of Bay View area (outside of planning areas).
Horned lark *Eremophila alpestris aetia*	–/SSC	Coastal California from Sonoma county southeast to the Mexican border, including San Joaquin Valley and Sierra Nevada foothills.	Open habitats with few trees, including: level or gently sloping short-grass prairies, montane meadows, coastal plains, fallow grain fields, and alkali flats.	Loss and fragmentation of habitat resulting from urbanization; mortality resulting from pesticide contamination and mowing.	Occurs in the Bay View planning area and in wetlands in North of Bay View area (outside of planning areas).
American white pelican *Pelecanus erythrorhynchos*	–/SSC	Coastal bays and estuaries, inland lakes.	Open water habitats.	Habitat loss in inland areas; pesticide (DDT) poisoning; decline in water quality.	Occurs in open water habitats in North of Bay View area (outside of planning areas).
White-tailed kite *Elanus leucurus*	SC/SSC	Year-round resident in Oregon and California except at high elevations.	Low rolling foothills and valley margins with scattered oaks for nesting and perching; river bottomlands and associated marsh habitats; open grasslands.	Habitat loss as a result of urbanization.	Nests locally; known to occur in wetlands in North of Bay View area (outside of planning areas).

Common Name *Scientific Name*	Status* Fed/State	California Distribution	Habitats	Reason for Decline/Concern	Potential for Occurrence in Moffett Field Study Area
Mammals					
Salt marsh harvest mouse *Reithrodontomys raviventris*	E/B	Saline wetlands of San Francisco Bay. Southern subspecies (*R. r. raviventris*) occupies San Mateo, Alameda, and Santa Clara counties.	Salt marsh habitat that supports large stands of pickleweed.	Habitat loss resulting from dredging and filling of pickleweed marshes around San Francisco Bay.	Occurs in pickleweed-dominated salt marshes in the North of Bay View area (outside of planning areas).
San Joaquin kit fox *Vulpes macrotis mutica*	E/E	Valley floor and adjacent low foothills of the San Joaquin Valley.	Open grasslands.	Habitat loss resulting from agriculture and urbanization.	No recorded observations in study area. Study area is likely outside range of species.
Riparian brush rabbit *Sylvilagus bachmani riparius*	E/E	Riparian forests along San Joaquin and Stanislaus Rivers in Stanislaus and San Joaquin Counties.	Dense, brushy areas of valley riparian forests not subject to regular or heavy flooding.	Habitat resulting from dam construction for irrigation and flood control on the major rivers of the Central Valley.	Probably extirpated from the area.
Salt marsh wandering shrew *Sorex vagrans halicoetes*	SC/B	Southern San Francisco Bay area.	Salt marshes 6–8 feet above sea level, where abundant driftwood is scattered among pickleweed.	Habitat loss resulting from dredging, diking, and filling of marsh habitats.	No recorded observations in the study area. Suitable habitat exists in surrounding salt marshes (outside the planning areas).
Western mastiff bat *Eumops perotis*	SC/SSC	Eastern San Joaquin Valley from El Dorado County south through Kern County; Coast Ranges, Peninsular Range, and Transverse Ranges from San Francisco to the Mexican border.	Roosts and breeds in deep, narrow rock crevices; may also use crevices in trees, buildings, and tunnels. Forages in a variety of semiarid to arid habitats.	Unclear; possibly insecticide contamination and loss of foraging habitat; possibly disturbance of roosting sites.	No recorded observations in study area; no suitable habitat is present.

Common Name *Scientific Name*	Status* Fed/State	California Distribution	Habitats	Reason for Decline/Concern	Potential for Occurrence in Moffett Field Study Area
Townsend's western big-eared bat *Plecotus townsendii townsendii*	SC/SSC	Coastal regions from Del Norte County south to Santa Barbara County.	Roosts in caves, tunnels, mines, and dark attics of abandoned buildings.	Unclear; possibly human disturbance of roosting sites.	No recorded observations in study area Buildings on site may provide roosting habitat, although current levels of use make the potential for roosting low.
Pallid bat *Antrozous pallidus*	B/SSC	At low elevations throughout California.	Roosts in rocky outcrops, cliffs, and crevices; requires access to open habitats for foraging.	Human disturbance of roosting sites.	No recorded observations in study area. May forage over wetland and riparian areas in Bay View, North of Bay View, and Eastside/Airfield.
Fringed myotis (*Myotis thysanodes*)	SC/-	Coastal regions of CA	Primarily associated with trees; sometimes roosts in buildings. Forages in vegetation, along forest edges, and over forest canopies	Unclear; possibly human disturbance of roosting sites.	No recorded observations in study area. Buildings on site may provide roosting habitat, although current levels of use make the potential for occurrence low.
Long-eared myotis (*Myotis evotis*)	SC/-	Coastal regions of CA, Sierra Nevada, Cascades, and Great Basin from Oregon to the Tehachapi Mountains	Observed roosting in buildings and under bridges. Forages along rivers and streams, over ponds, and within cluttered forest environments	Unclear; possibly human disturbance of roosting sites.	No recorded observations in study area. Buildings on site may provide roosting habitat, although current levels of use make the potential for roosting low. May forage over wetland and riparian areas in Bay View, North of Bay View, and Eastside/Airfield.

Common Name *Scientific Name*	Status* Fed/State	California Distribution	Habitats	Reason for Decline/Concern	Potential for Occurrence in Moffett Field Study Area
Long-legged myotis (*Myotis volans*)	SC/-	Coast Ranges and Sierra Nevada, and Great Basin regions	Associated with forest habitats. Reported to day roost in buildings. Forages over open areas.	Unclear; possibly human disturbance of roosting sites. Lack of forest habitat.	No recorded observations in study area. Buildings on site may provide roosting habitat, although current levels of use make the potential for roosting low. May forage over wetland and riparian areas in Bay View, North of Bay View, and Eastside/ Airfield.

*Status Explanations: Federal Status:
E = listed as endangered under the federal Endangered Species Act
T = listed as threatened under the federal Endangered Species Act
PR = protected under the federal Bald and Golden Eagle Protection Act
C = federal candidate species (formerly Category 1; may be proposed for listing in the future)
B = no designation
SC = species of special concern

State Status:
E = listed as endangered under the California Endangered Species Act
T = listed as threatened under the California Endangered Species Act
SSC = state species of special concern
– = no listing

Sources: *California Department of Fish and Game website (http://www.dfg.ca.gov/endangered/index.html), US Fish and Wildlife Service Division of Endangered Species website (http://www.endangered.fws.gov/r1spndx.html), Natural Diversity Data Base (California Department of Fish and Game 1999a), Skinner and Pavlik (1994), Peterson (1990), (Trulio 1999).*

3.10 NOISE

A. Background Information

This section gives background information on the key topics related to noise at Ames Research Center, including a discussion of the basic properties of sound, the health effects of noise, a general overview of noise and human response, noise and weather effects, and the effects of airborne noise-induced vibration.

The key technical terms used in this chapter are defined in Table 3.10-1.

1. Noise Exposure

Noise exposure measurements are a way of measuring the average dose of noise over a period of time. Noise exposure measurements correlate more closely with human response to noise annoyance than do absolute or instantaneous noise level measurements because they consider both the noise level and the duration of noise events. For this reason, nearly all noise criteria used for land use compatibility are based on noise exposure rather than noise level.

Noise exposure contours show lines of equal noise exposure. Contour values become smaller with distance from the noise source to reflect the reduction of the noise as it travels across the earth's surface. Noise exposure contours will typically be numerically smaller than noise level contours for an individual noise event, since measurements of noise exposure take account of both periods of relative quiet and noise events. Examples of noise exposure descriptors are CNEL and DNL (quantity symbol L_{dn}). Noise exposure impacts are addressed in Section 4.10.

All noise levels and noise exposure levels throughout this document are A-weighted in accordance with appropriate standards and criteria. All such values are in units of decibels, whose unit symbol is "dB" in conformance with American National Standard ANSI/ASME Y10.11-1984. The unit symbol "dBA" is not the standard symbol used under ANSI Y10. 11. All numerical noise values in this document symbolized "dB" are numerically identical to those using "dBA," often found in other references.

TABLE 3.10-1 **DEFINITIONS OF ACOUSTICAL TERMS**

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Day/Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
L_{max}, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.

Source: Illingworth & Rodkin.

Typical environmental noise levels are shown in Table 3.10-2.

2. Sound Propagation Attenuation

Several factors account for sound attenuation, or sound reduction, as it travels from a source, as described below:

a. Hemispherical Spreading

Sound is always attenuated by hemispherical spreading, which generally is the reduction of the sound pressure level, or noise level, as the sound travels over a surface, usually the earth. This is the same phenomenon as the intensity of light diminishing with distance from the light source. Hemispherical spreading occurs at the rate of 6 dB per doubling of the distance from the source.

All frequencies of a sound attenuate uniformly over a surface by hemispherical spreading. The results of hemispherical spreading are affected by the directivity characteristics of the sound source.

Complex sound sources emit more sound energy in one direction than another. These effects are much more pronounced close to the source than they are further away. As the distance from any noise source becomes larger, sound energy emanating from the source becomes more equal in any given direction. Therefore, noise contours drawn to illustrate the sound energy become more circular as they get further away from the sound source.

b. Air Absorption

Air absorption, unlike hemispherical spreading, attenuates sound at a particular frequency uniformly with distance. Air absorption dramatically affects high frequency sound while providing little or no attenuation of low frequencies. An example of this phenomena is when aircraft jet engines appear to shrill when up close, but produce only a low roar at distant locations. Though sound is attenuated through air absorption at all times, the degree of attenuation varies with the weather.

TABLE 3.10-2 **TYPICAL SOUND LEVELS IN THE ENVIRONMENT AND INDUSTRY**

At a Given Distance From Noise Source	A-Weighted Sound Level in Decibels	Noise Environments	Subjective Impression
	140		
Civil Defense Siren (100')	130		
Jet Takeoff (200')	120		Pain Threshold
	110	Rock Music Concert	
Diesel Pile Driver (100')	100		Very Loud
	90	Boiler Room	
Freight Cars (50')		Printing Press Plant	
Pneumatic Drill (50')	80		
Freeway (100')		In Kitchen With	
Vacuum Cleaner (10')	70	Garbage Disposal Running	Moderately Loud
	60		
		Data Processing	
Light Traffic (100')	50	Center	
Large Transformer (200')			
	40	Department Store	Quiet
Soft Whisper (5')	30	Private Business Office	
	20		
		Quiet Bedroom	
	10		Threshold of Hearing
		Recording Studio	
	0		

Source: Illingworth & Rodkin.

c. Sound Refraction

Sound refraction is a bending of sound, typically around some type of barrier, which can either increase or decrease the sound attenuation at a given location. A common example of a barrier which causes sound refraction is a freeway sound wall. Sound walls have the effect of substantially reducing noise to areas immediately protected by the noise barrier, while possibly reflecting the noise to new locations in the immediate vicinity of the barrier. In general, sound walls or other types of barriers have negligible attenuation to more distant locations beyond the noise source or barrier. Sound refraction can also be caused by both temperature gradients and by wind, as described below.

i. Sound Refraction by Temperature Gradients

When temperatures are constant with altitude (isothermal conditions), no atmospheric sound refraction occurs. However, when temperatures vary with altitude (temperature gradients) sound refraction can occur.

A negative temperature gradient exists when cooler air is found above warmer air. This typical condition refracts sound waves up and away from the surface of the earth and can attenuate sound by as much as 25 dB at distances less than 0.8 kilometers (half a mile).

A positive temperature gradient occurs when warmer air is found above cooler air. This condition, known as thermal inversion or an inversion layer, refracts sound waves toward the surface of the earth. While thermal inversion has little or no effect at short distances, it tends to reduce or eliminate the attenuation effects of ground absorption and barriers over long distances. Thus, sound tends to carry further under thermal inversion conditions. As a result, this condition can cause substantial increases in noise transmission.

Thermal inversion is known to occur fairly often in the Mountain View area. This effect has contributed to the ongoing dispute between the cities of Palo Alto and Mountain View over Shoreline Amphitheater concert noise.

However, temperature gradients are unpredictable and they do not lend themselves to evaluating predictable long-term effects.[1,2]

ii. Sound Refraction by Wind

Steady, low velocity wind has a negligible effect on sound propagation. However, high velocity wind or changes in wind conditions with altitude (wind speed gradients) can produce refractive effects similar to those for temperature gradients. Sound propagation in the direction an item would be carried by the wind (downwind) results in sound waves refracting toward the earth. Like a temperature inversion, this has little or no effect at short distances. It does, however, reduce the refractive effects of surface barriers over long distances. Sound propagation upwind refracts the sound up and away from the earth. As with a negative temperature gradient, this may result in additional attenuation of up to 25 dB at distances less than three kilometers.

Both upwind and downwind effects are only measurable for steady long-term average wind velocities in excess of 10 knots.[3,4] Climatic data for the project area indicates that average wind velocity typically exceeds 10 knots for a few

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[1] L.N. Miller. *Noise Control for Buildings and Manufacturing Plants*. Bolt, Beranek, and Newman. Cambridge, MA. 1981.

[2] R.T. Harrison. R.N. Clark, and G.H. Stankey. *Predicting impacts of Noise on Recreationists*. Project Report, Forest Service. U.S. Department of Agriculture. April 1980.

[3] D. N. Keast. *Procedure for Predicting Noise Environments Around Industrial Sites*. Bolt, Beranek, and Newman Report No. 2997. Prepared for the Long Island Lighting Company. September 1974.

[4] L.L. Beranek. *Noise and Vibration Control.* McGraw-Hill. New York, New York. 1971.

hours in the afternoon of the summer months. These north-by-northeast winds may result in some upwind or downwind refraction during these times.[5,6]

Additionally, gusty winds can scatter sound over large distances; however, this effect is only transitory and cannot be reliably predicted.[7] Wind can also generate its own noise, such as the rustling of trees, which raises the background noise and may diminish the intrusive effects of a distant noise source.

3. Airborne Noise-Induced Vibration

One aspect of community response to noise involves high levels of low-frequency airborne sound that can induce building vibration. This phenomenon sometimes occurs in conjunction with ground vibration, as in the case of nearby train passbys, or can occur without perceptible ground vibration, as is typical with wind tunnel or aircraft noise. In this report, only airborne noise-induced vibration will be discussed since ground vibration is not expected to occur.[8]

House structures have many components that can readily be excited by noise and respond as complex vibrating systems.[9] Airborne vibration, or "rattling",

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[5] NASA Ames Research Center. *Naval Air Station Moffett Field Existing Conditions Report. Phase 2*. NASA Ames Research Center Facilities Planning Office. May 22. 1992.

[6] Western Regional Climate Center. *Hourly Wind Data*. Reno, Nevada. Information extracted from copies of the historical National Climate Data Center (NCDC) Surface Airways Hourly Tapes. March 3. 1995.

[7] L.N. Miller. *Noise Control for Buildings and Manufacturing Plants*. Bolt, Beranek, and Newman. Cambridge, MA. 1981.

[8] Nelson, P.N. *Transportation Noise Reference Book*. Butterworths. London 1987.

[9] Hubbard, H.H. *Noise-Induced House Vibrations and Human Perception, Noise Control Engineering Journal, 19*, 49-55. 1982.

is usually heard when noise emanates from the following items, which are listed, in decreasing likelihood of vibration:

- Windows
- Lightweight, lay-in ceiling tiles
- Walls
- Floors
- Dishes, ornaments and lamps due to the vibration of either the walls or the floors

Additionally, noise-induced vibration can sometimes be felt through windows, walls or floors by the touch of finger tips, and in extreme cases, damage to the item, such as plaster and tile, could occur from vibration. These phenomena are generally observable with very high sound pressure levels at frequencies below 300 Hz.

4. Effects of Noise

This section discusses some of the health effects and other responses that can occur as a result of noise.

a. Hearing Loss

Hearing loss is the primary health risk associated with high noise levels. People who are exposed to an excessive amount of noise develop permanent hearing loss. In most persons, the beginning of noise-induced hearing loss is hard to define, but it follows repeated exposure to industrial or recreational noise, such as loud music. Damage to the inner ear generally does not create pain or any other obvious sensory response or alarm. Loss of hearing can result from exposure to impulse or impact noise as well as from exposure to steady-state (continuous) noise. The hearing loss caused by excessive exposure to noise is a permanent impairment, and no surgical procedure or medical device can

restore the hearing to normal. Thus, prevention is the only way to avoid noise-induced hearing loss.[10]

The ear is injured by noise in two very different ways, depending upon the level of exposure. First, instantaneous peak sound pressure levels in excess of 140 dB can stretch the delicate inner ear tissues beyond their elastic limits, and rip or tear them apart. This type of damage is called acoustic trauma. Second, exposures to noise between 85 and 140 dB damage the ear metabolically, rather than mechanically. In this case, the potential for damage and hearing loss depends on the levels and the duration of exposure. This type of injury is called noise-induced hearing loss (NIHL) and, in contrast to acoustic trauma, is cumulative and grows over years of exposure.

Hearing damage has been studied extensively in the United States, resulting in the noise exposure standards of the Department of Labor's Occupational Safety and Health Administration (OSHA). Additionally, the NASA Health Standard on Hearing Conservation (NHS/IH-1845.4) establishes minimum requirements for hearing protection. Both of these regulatory mechanisms are discussed in more detail in Section B. I of this chapter.

b. Non-Auditory Health Effects

Short-term exposure studies have demonstrated that noise is capable of eliciting a variety of acute physiological and biochemical responses in humans. These responses appear to represent a generalized biologic stress reaction involving sympathetic activation of the autonomic nervous system. These include symptoms such as an increase in blood pressure, other forms of physical stress, and an overall increase in psychological stress.

Physical stress reactions can be observed when people are exposed to noise levels of 85 dB or more. Dilated pupils, elevated blood pressure, and an

[10] American Family Physician. *Adverse Effects of Noise on Hearing*. Volume 47. Pages 1219- Robert S. Bahadori and Barbara A. Bohne. 1992.

increase of stomach acid leading to a nauseous feeling are typical reactions when the noise environment is increased above those levels normally found in a community noise environment. There is disagreement among experts as to whether these reactions pose a threat to health, with long-term exposure.

Psychological stress varies from individual to individual. This type of stress can be caused by sleep disturbance, inability to carry on a conversation, or other annoying factors of noise. The community standards described in Section B.2 of this chapter have been designed for sleep protection. When a noise environment exceeds these standards sleep disturbance, and thus psychological stress, may occur. Noise above 65 dB makes it difficult to have a normal conversation without raising one's voice, and could cause psychological stress in certain individuals.

c. Noise and Human Response

It is widely recognized that human response to noise is subjective and varies considerably among individuals. Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individuals' thresholds of annoyance, habituation to noise, and differing individual past experiences with noise. An important factor in assessing a person's subjective reaction to noise is comparing existing noise to proposed noise. Generally, the more a new noise exceeds existing noise, the less acceptable it is to the community. Therefore, a new noise source would be judged more annoying in a quiet area than it would in be in a noisier location. Knowledge of the following relationships is helpful in understanding how changes in noise and noise exposure are perceived:

- Except under special conditions, a change in sound level of 1 dB cannot be perceived.
- Outside of the laboratory, a 3 dB change is considered a just-noticeable difference.

— A change in level of at least 5 dB is required before any noticeable change in community response would be expected.

— A 10 dB change is subjectively heard as an approximate doubling in loudness and often causes an adverse community response.

Noise and land use compatibility guidelines generally correlate with widely accepted annoyance levels of a community. These regulations are discussed in more detail in Section B.2 of this chapter.

B. Regulatory Environment

1. Hearing Conservation Standards[11]

Given the concerns outlined in Section A, the Department of Labor's Occupational Safety and Health Administration (OSHA) has developed noise exposure standards for U.S. workers. These noise exposure standards allow for noise levels of 90 dB for 8 hours per day and decreasing exposure duration for higher noise levels up to a maximum of 115 dB for 15 minutes or less without hearing protection. These standards apply to virtually all industries within the United States.

The NASA Health Standard on Hearing Conservation (NHS/IH-1845.4) establishes minimum requirements for the NASA Agency-wide Hearing Conservation Program. This standard is applicable to all NASA employees and NASA controlled, government-owned facilities. Permissible exposure limits outlined by the NASA Hearing Conservation Program vary with the sound

[11] *Department of Labor Occupational Noise Exposure Standard*. 29 C.F.R. Part 1910, subpart G.

TABLE 3.10-3 **PERMISSIBLE EXPOSURE LIMITS FOR NOISE ACCORDING TO NASA'S HEARING CONSERVATION PROGRAM**

Duration (Hours)	dBA*
16	80
8	85
4	90
2	95
1	100
0.5	105
0.25	110
0.125 or less	115

Notes:
* dBA is the abbreviation for the A-weighted sound level. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear. All noise levels and noise exposure levels throughout this document are A-weighted in accordance with appropriate standards and criteria. All such values are in units of decibels, whose unit symbol is "dB" in conformance with American National Standard ANSI/ASME Y10. 11- 1984. The unit symbol "dBA" is not the standard symbol used under ANSI Y1O.11. All numerical noise values in this document symbolized "dB." are numerically identical to those using "dBA." often found in other references.

pressure level of the noise, as detailed in Table 3.10-3. It is NASA policy to control noise generated by NASA operations and to prevent occupational noise-related hearing loss. In accordance with this policy, maximum permissible exposure limits have been established to provide an environment free from hazardous noise.

The Hearing Conservation Program establishes a noise hazard area as any work area with a noise level of 85 dBA or greater. Thus, NASA's program is 5 dB more stringent than that of OSHA. Earmuffs or earplugs are to be provided to attenuate employee noise exposure to a level below 85 dBA. A combination of both car muffs and plugs are to be required where noise levels equal or exceed 110 dBA.

2. Land Use Hearing Conservation Standards

The nuisance effects of noise have traditionally been addressed in terms of noise annoyance. This annoyance is known to be associated with the level of noise, the duration of the noise, and increased sensitivity to evening and nighttime noise. Since 1972, when Congress enacted the Noise Control Act (NCA),[12] several documents have been published that provide guidance on assessing the nuisance and annoyance effects of noise, and related land use compatibility issues. The following is a summary of the documents most applicable to assessing noise and land use compatibility for Ames Research Center.

— *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (1974).* The NCA of 1972 required the Environmental Protection Agency (EPA) to publish information on acceptable community noise levels. The result was EPA550/9-47-004, which is commonly referred to as the "Levels Document". This document establishes the DNL as the preferred community noise descriptor, with DNL values being directly related to the

[12] Noise Control Act (NCA), Public Law 92-574 (42 U.S.C. 4901 et seq).

percentages of the community that would be annoyed by particular noise exposures.

- *Guidelines for Considering Noise in Land Use Planning and Control (1980).* In late 1979, the Federal Interagency Committee on Urban Noise (FICUN) was formed to unify noise policy among various Federal agencies. In 1980 it published Guidelines for Considering Noise in Land Use Planning and Control, which confirms DNL as the descriptor to be used for all noise sources. In 1992, a second interagency committee, the Federal Interagency Committee on Noise (FICON), published its Federal Agency Review of Selected Airport Noise Analysis Issues, which again confirms DNL as the best cumulative noise exposure measurement.
- *Sound Level Descriptors for Determination of Compatible Land Use (1990).* In 1990, the American National Standard Institute (ANSI) revised its 1980 standards for sound level descriptors for land use compatibility assessment to confirm DNL as the acoustical measure for assessing compatibility between various land uses and the outdoor noise environment.
- *General Plan Guidelines (1990).* Also in 1990, the California Governor's Office of Planning and Research (OPR) published guidelines to aid California municipalities in preparing their General Plans. This document uses the CNEL and DNL noise descriptors interchangeably to relate land use compatibility for community noise environments.

The most commonly used noise exposure measure for environmental noise is DNL or L_{dn} This is a night penalized average used for most noise and land use compatibility criteria. The day-night average sound level is obtained after the addition of ten decibels (10 dB) to noise levels measured in the night between 10:00 p.m. and 7:00 a.m. In California, an alternative measure is the CNEL, which is similar to DNL except a 5 dB penalty is added during the evening hours of 7:00 to 10:00 p.m. Because DNL and CNEL nearly always render results within 1 dB, they can generally be compared in land use compatibility analyses.

In general, noise criteria apply to land use compatibility for new development. These criteria are specified in terms of exterior noise levels, although the noise sensitive area may be indoors. Various methods exist for the accurate prediction of sound transmission loss and sound level reduction to the indoor environment. For the purposes of this EIS, noise criteria are presented in exterior noise levels.

No State or local noise criteria are binding on the type of noise to be created by the NASA Ames Research Center. NASA attempts, whenever possible, to meet local guidelines and standards and considers them as advisory in nature. Despite the lack of binding regulation, NASA uses the following noise guidelines and regulations in this EIS to provide guidance for determining the relative impact of the proposed project:

- *Federal Criteria.* Three federal criteria provide guidance in determining noise impacts. These are the noise criteria from the Department of Housing and Urban Development (HUD), those from the Federal Aviation Administration (FAA), and guidelines created by the Army.
- *State Criteria.* The State of California Guidelines for preparation of Noise Elements of General Plans and the Caltrans Division of Aeronautics noise exposure criteria provide guidance in determining noise effects.
- *Local Criteria.* Local criteria that provide guidance near NASA Ames include noise criteria from the City of Mountain View, the City of Sunnyvale, and Santa Clara County.

Specific federal, State, and local land use compatibility noise criteria are described below and are summarized in Table 3.10-4. These noise criteria are written for various purposes. The levels provided by federal agencies, such as HUD and the FAA, are to be used as general planning guidelines, considering cost and feasibility, along with health and welfare. HUD levels also determine if proposed sites are eligible for HUD insurance or financial

TABLE 3.10-4 **LAND USE COMPATIBILITY NOISE EXPOSURE CRITERIA**

		Residential		Commercial		Industrial		Open Space	
Sources	**Measure**	**Normally Acceptable**	**Conditionally Acceptable**	**Normally Acceptable**	**Conditionally Acceptable**	**Normally Acceptable**	**Conditionally Acceptable**	**Normally Acceptable**	**Conditionally Acceptable**
Department of Housing and Urban Development (HUD)	DNL	<65	65 - 75	--	--	--	--	--	--
Federal Aviation Administration (FAA)	DNL/CNEL	<65	--	<70	70 - 80	<85	--	<75	--
U.S. Army	DNL/CNEL	<65	65 - 75	<70	70 - 80	<85	--	<75	--
California Planning Guidelines	DNL/CNEL[1]	<60	55 - 70	<70	67.5 - 77.5	<75	70 - 80	<70 - 75	67.5 - 80
California Division of Aeronautics	CNEL[2]	<65	65 - 70	--	--	--	--	--	--
City of Mountain View	DNL/CNEL	<55	55 - 65	<60	60 - 70	<65	65 - 75	<55	55 - 65
City of Sunnyvale	DNL/CNEL	<60	60 - 70	<65	65 - 77.5	<70	70 - 80	<70	--
Santa Clara County	DNL	<55	55 - 65	<65	65 - 75	<70	70 - 75	<55	55 - 80

1. Uncorrected CNEL.
2. Annual average.

-- = No criteria for this land use.

Source: NASA Ames Aerodynamics Testing Program Final EIS, 1998.

assistance. The State of California Planning Guidelines were prepared as an information document to provide communities with a means of quantifying noise environments. The California Division of Aeronautics' regulation deals specifically with land use compatibility around airports. The Santa Clara County, Sunnyvale, and Mountain View criteria apply to proposed new construction. The overlap in noise exposure values over several degrees of acceptability show the variation in community acceptability to noise exposure.

a. Federal Noise Criteria

For residential land use, outdoor DNL or CNEL below 65 dB is considered acceptable according to the Department of Housing and Urban Development (HUD) and the Federal Aviation Administration (FAA). According to the FAA, DNL values below 70 dB are normally acceptable for commercial land use. Commercial land use is conditionally acceptable between 70 dB and 80 dB, while industrial land use in areas below DNL values of 85 dB is normally acceptable. Open space use is to occur in areas below 75 dB. HUD does not detail noise criteria for land uses other than residential.

Additionally, the U.S. Army provides guidance on noise and compatible land uses.[13] Criteria for rating noise will be those from *Guidelines for Considering Noise in Land Use Planning and Control by the Federal Interagency Committee on Urban Noise* (FICUN, 1980).

b. State Noise Criteria

The California State Planning Guidelines (Figure 3.10-1) show DNL or CNEL values below 60 dB to be acceptable for residential land use, and values below 70 dB as acceptable for commercial land use. Industrial land use in areas below DNL values of 75 dB is also acceptable. Open space use is acceptable in areas below 70 dB, depending upon the specific nature of the space; for example, playgrounds are acceptable up to 70 dB and golf courses are acceptable up to 75

[13] U.S. Army Center for Health Promotion and Preventive Medicine. *Environmental Noise Management, An Orientation Handbook for Army Facilities.* May 2001.

dB. The California Division of Aeronautics considers residential DNL values below 65 dB to be acceptable.

c. Local Noise Criteria

The City of Mountain View has one of the strictest residential noise standards of any municipality in California for residential land use. A DNL below 55 dB is specified for new construction, although many residences throughout the City are already exposed to more severe noise environments. The commercial and industrial land use criteria are 60 dB.

In addition to the noise exposure criteria in the Mountain View Noise Element, a noise ordinance is also referenced in the Noise Element and applied by the City. This specifies a 55 dB maximum noise level from stationary emitters in the City of Mountain View when measured at residential property lines during the daytime, and 50 dB during the nighttime (10:00 p.m. to 7:00 a.m).

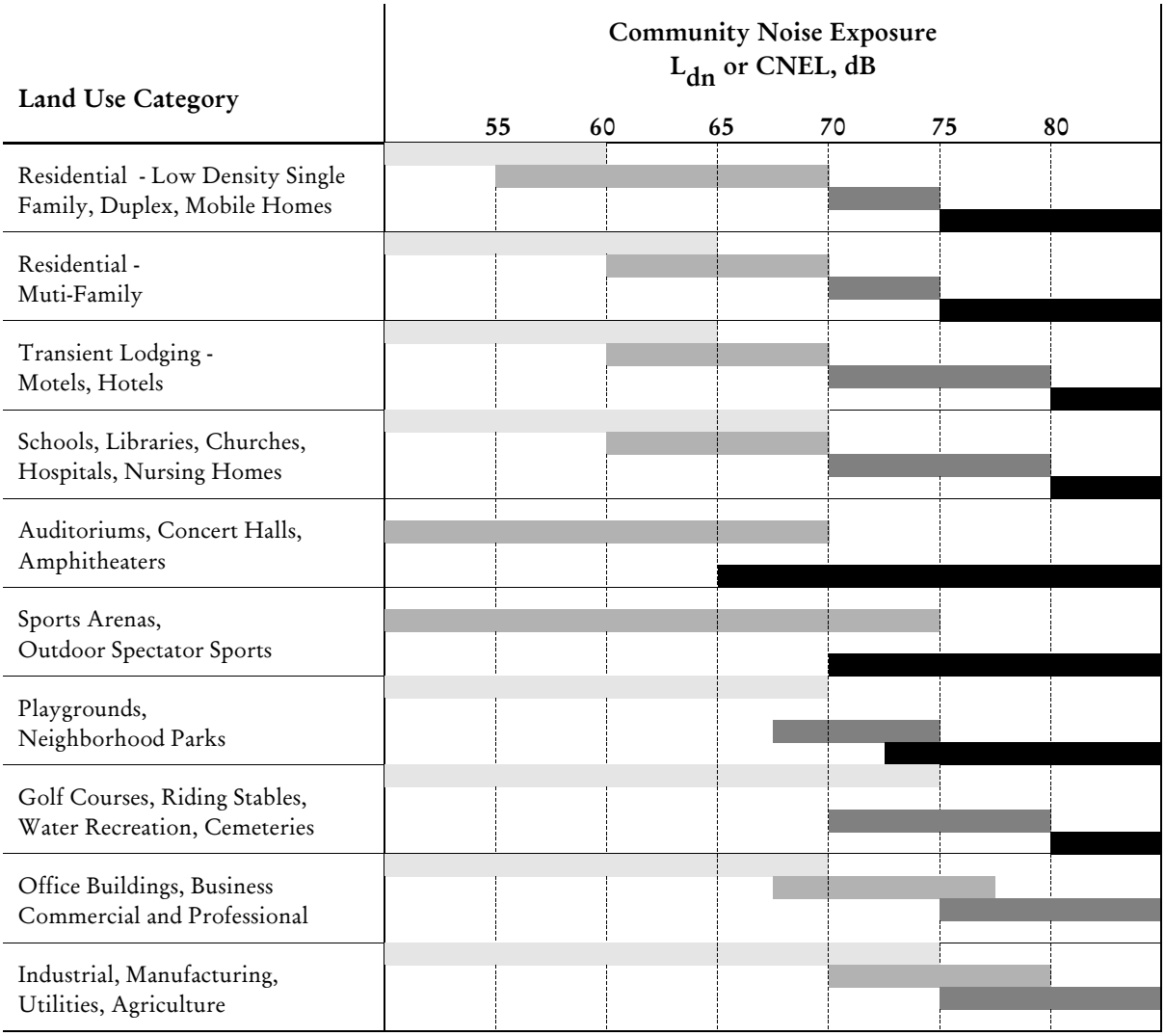
The Sunnyvale criteria follow the State Guidelines rather closely, the only exception being open space use, which is to occur in areas below a DNL of 70 dB. The authors of the Sunnyvale Noise Supplement indicated that DNL should be interpreted as the yearly average throughout their document.

Like Mountain View, Santa Clara County follows the lowest noise acceptability limits found in California for residential land use, at a DNL of 55 dB.

C. Existing Noise Environment

This section describes the existing noise environment at NASA Ames Research Center. Noise exposure contours and levels presented in this section were determined from NASA measurement surveys taken over the past 15 years and noise monitoring conducted for this EIS.

FIGURE 3.10-1 **LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS**



Source: Guidelines for the preparation and content of the Noise Element of the General Plan, State of California Governor's Office of Planning and Research.

INTERPRETATION

Normally Acceptable: Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

Normally Unacceptable: New construction or development should generally be discouraged. If new construction does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.

Clearly Unacceptable: New construction or development should generally not be undertaken.

Noises generated by NASA Ames and Moffett Field have historically been a source of complaints from surrounding areas. Noise produced by many of the wind tunnels and aircraft operations generate complaints from residents off-site.

Figures showing noise contours described in this section all occur at the end of this section.

1. Wind Tunnels

Among NASA's wind tunnels, the primary noise generators include:

- *40- by 80-Foot Wind Tunnel.* The 40- by 80-Foot Wind Tunnel is a closed circuit wind tunnel. A typical test day can consist of one or two shifts day or night. Each test shift averages approximately four hours, with the wind tunnel running. Current noise exposure levels from this facility are presented in Figure 3.10-2.
- *80- by 120-Foot Wind Tunnel.* The 80- by 120-Foot Wind Tunnel is a non-return wind tunnel that shares the same drive system as the 40- by 80-Foot Wind Tunnel. Because both facilities use the same drive system, only one can be operated at a time. Figure 3.10-3 shows the current noise exposure levels for the 80- by 120-Foot Wind Tunnel.
- *Unitary Plan Wind Tunnels.* The Unitary Plan Wind Tunnel complex consists of three wind tunnels, the 11-foot, the 9- by 7-foot, and the 8- by 7-foot. Only one of these tunnels can be used at a time. At present, only the 11-foot tunnel is regularly used. The 9- by 7-foot Supersonic Wind Tunnel and the 8- by 7-foot Supersonic Wind Tunnel are currently not in operation. Noise levels were measured during operation of the 11-foot Transonic Wind Tunnel in October 2000. Measured noise levels ranged from 80 to 85 dBA along Wagner Lane at distances of 15 to 20 meters (50 to 75 feet) west of the facility. Noise levels along Mark Avenue between Wagner and Boyd Road typically range from 75 to 79 dBA. Noise levels were measured inside the lobby of Building N-234 on Boyd Road directly east of the Wind Tunnel. The measured noise level was 48 dBA and the operating tunnel was barely audible. Noise levels along DeFrance Avenue

were measured at several locations north of the facility and typically ranged from 65 to 70 dBA. Figure 3.10-4 shows the current noise exposure levels for the complex.

— *12-Foot Pressure Wind Tunnel*. The 12-foot Pressure Wind Tunnel also generates noise. Noise levels measured for NASA worker exposure evaluations provide some data for the tunnel. The measured noise levels are 90 dBA at 61 meters (200 feet) from the tunnel at Bushnell Street and 80 to 90 dBA at the cooling towers located north, south, east and west of the facility. Figure 3.10-5 shows the noise exposure contours for the 12-foot Pressure Wind Tunnel.

2. Arc Jets

The arc jets facility is used to perform high temperature materials tests. Noise levels were measured during operation of the arc jets in June 2001. Measured noise levels reached 80 dBA at a distance of 50 meters (146 feet) north of the facility, 78 dBA at a distance of 75 meters (246 feet) to the east of the cooling towers, and 75 dBA along Boyd Road south of the facility. Figure 3.10-6 shows the noise exposure levels for the arc jets facility.

3. Airfield Operations, Traffic, and Other Existing Noise Sources

In addition to the wind tunnels, OARF and arc jets, there are several significant sources at and beyond the NASA Ames Research Center that affect the four planning areas and the surrounding community, most notably airfield operations and traffic noise from local highways.

The NASA Ames Research Center is home to a variety of government aircraft. Noise from Moffett Federal Airfield has been evaluated for the period from 1999 to 2010.[14] Noise exposure contours were determined in terms of the Community Noise Equivalent Level (CNEL). CNEL is considered equivalent

[14] *Assessment of Aircraft Noise Conditions at Moffett Federal Airfield (1999-2010)*, prepared for DMJM by P&D Consultants, Inc., and Michael R. McClintock & Company, August 28, 2000.

to L_{dn}. Figure 3.10-7 shows noise contours from NASA baseline aircraft operations.

Ambient traffic noise measurement were made on Wednesday, September 22, 1999 at four locations within the NASA Ames Research Center. Figure 3.10-8 shows the locations of the noise measurements. Noise levels were measured adjacent to Highway 101 at an exposed location along South Perimeter Road (S1), in a location protected by a sound wall at Westcoat Court (S2), and at a distance form the Highway near Building 547C on Girardi Road (S3) to determine how noise levels decrease over distance. The final measurement was conducted at the intersection of Cody Road and Severns Avenue (S4). The data gathered during these measurement is summarized in Table 3.10-5. The existing DNL noise exposure contours resulting from traffic are shown in Figure 3.10-9.

4. Composite Noise Exposure Contours

Composite noise exposure contours of existing noise conditions at the NASA Ames Research Center are presented in Figure 3.10-10. These contours were developed using the following information:

- Moffett Field airstrip CNEL Noise Exposure, 1999.
- Noise measurement along Highway 101.
- Noise measurement of the Unitary Plan Wind Tunnel.
- NASA Ames Aerodynamic Testing Project EIS.
- Noise measurement of the arc jets.

Thus Figure 3.10-11 represents a composite of noise contours from all of these noise sources.

5. Outdoor Aerodynamic Research Facility

The Outdoor Aerodynamic Research Facility (OARF) is located in the Bay View area. The OARF is used to obtain a wide range of hover and acoustic

TABLE 3.10-5 **AMBIENT TRAFFIC NOISE LEVELS**

Location	L_{eq}	$L_{(10)}$	$L_{(50)}$	$L_{(90)}$	Dominant Noise Source
S1: Recreation Fields south of Dailey Road; microphone 5' above grade	74	76	73	72	Highway 101 Traffic
S2: Westcoat Court; 50' from the property line; microphone 5' above grade	68	69	67	66	Highway 101 Traffic
S3: Building 547C; microphone 5' above grade	56	57	55	54	Highway 101 Traffic
S4: Cody Road at Severns Road; microphone 5' above grade	53	57	50	49	Highway 101 Traffic

Note: Data were gathered during the afternoon of September 22, 1999.

Source: Illingworth & Rodkin.

data on full-scale or small-scale aircraft and other aerospace equipment. High noise-generating projects, such as powered model tests, run an average of two hours per day. Other tests have been administered at the facility for up to seven hours per day.

The experimental physics branch is currently testing hybrid rocket fuel motors at the OARF. Rocket fuel test noise levels were measured by NASA staff in September 2001.[15] The orientation for the rocket test rig and measured noise levels are shown on Figure 3.10-11. The measured noise levels reflect the effects of orienting the facility to mitigate potential noise impacts. The noise levels are generated for very short time intervals, approximately 10 to 20 seconds.

[15] Sound Measurement Results for September 24, 2001 Paraffin Wax Rocket Test Firing, memo from Lynne Kaswani, PAI Corporation to PAI Team.

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FIGURE 3.10-2

EXISTING 40-BY 80-FOOT WIND TUNNEL OPERATIONS ANNUAL Ldn NOISE EXPOSURE CONTOURS (dB)

Source: Illingworth & Rodkin, Inc.

0 76m 152m 305m

0 250ft 500ft 1000ft

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

FIGURE 3.10-3

EXISTING 80-BY 120-FOOT WIND TUNNEL OPERATIONS ANNUAL Ldn NOISE EXPOSURE CONTOURS (dB)

Source: Illingworth & Rodkin, Inc.

N

0 76m 152m 305m

0 250ft 500ft 1000ft

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

Source: Illingworth & Rodkin, Inc.

FIGURE 3.10-4

UNITARY PLAN WIND TUNNEL
ANNUAL Ldn NOISE EXPOSURE CONTOURS (dB)

0 76m 152m 305m

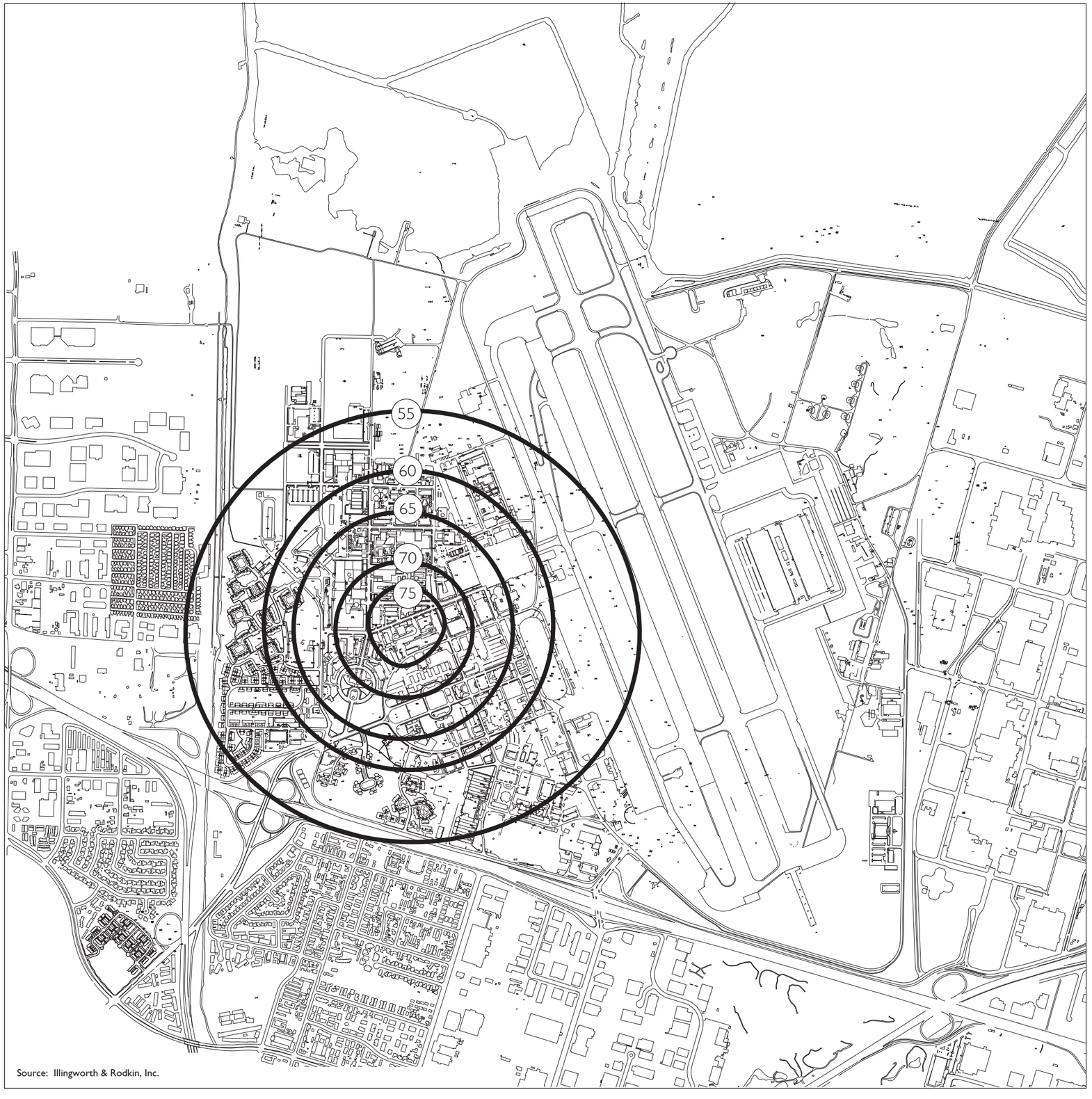
0 250ft 500ft 1000ft

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

FIGURE 3.10-5

12 FOOT PRESSURE WIND TUNNEL
ANNUAL Ldn NOISE EXPOSURE CONTOURS (dB)



Source: Illingworth & Rodkin, Inc.

N

0 76m 152m 305m

0 250ft 500ft 1000ft

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

FIGURE 3.10-6

ARC JETS
ANNUAL Ldn NOISE EXPOSURE CONTOURS (dB)

Source: Illingworth & Rodkin, Inc.

N

0 76m 152m 305m

0 250ft 500ft 1000ft

Source: P&D Consultants, Inc.0

FIGURE 3.10-7

AIRFIELD
CNEL NOISE EXPOSURE (dB)

(Applicable to both 1999 and 2010)

N

0 76m 152m 305m

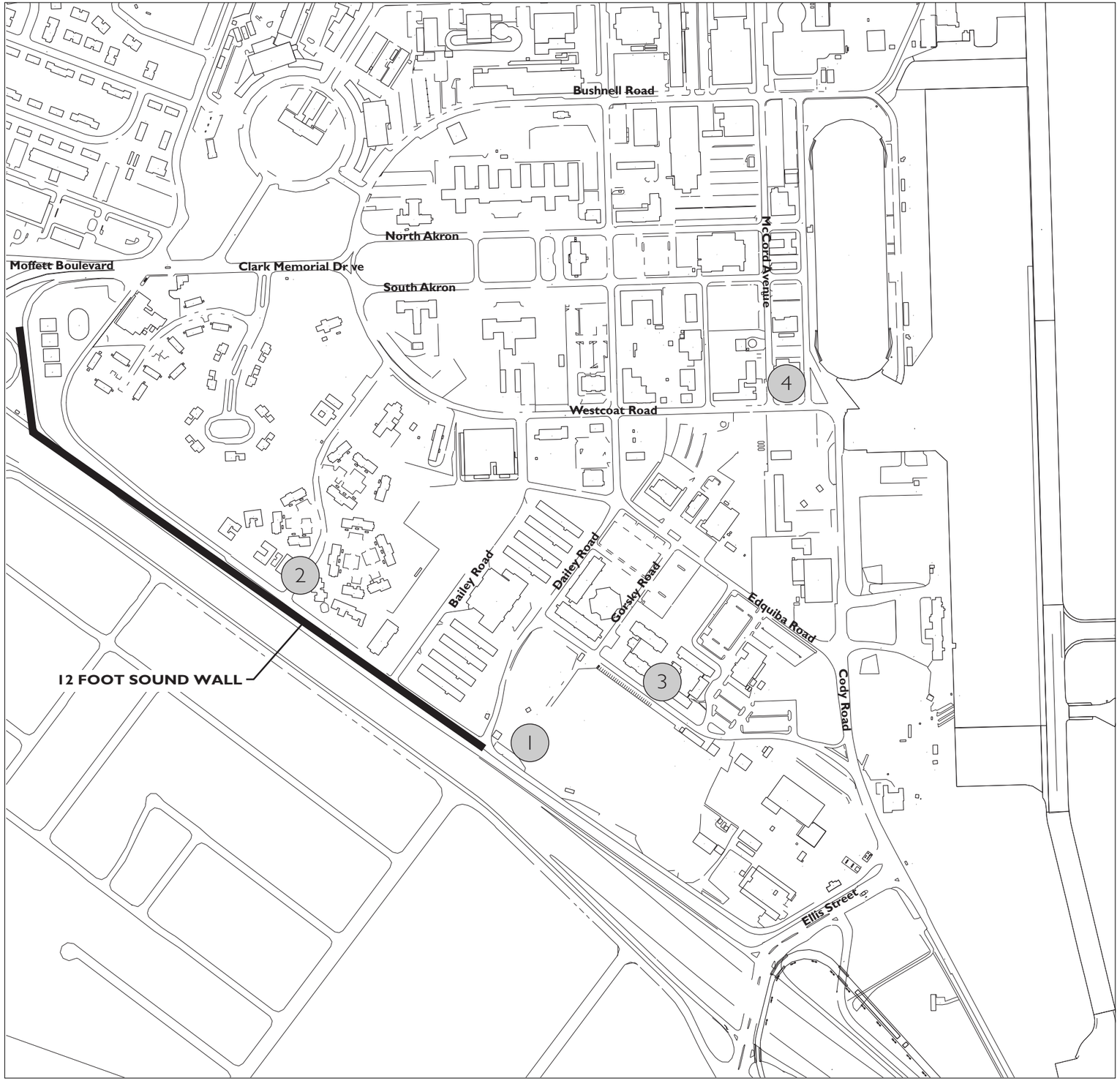
0 250ft 500ft 1000ft

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

FIGURE 3.10-8

LOCATION OF AMBIENT TRAFFIC NOISE MEASUREMENTS



0 25m 51m 102m

0 83ft 167ft 333ft

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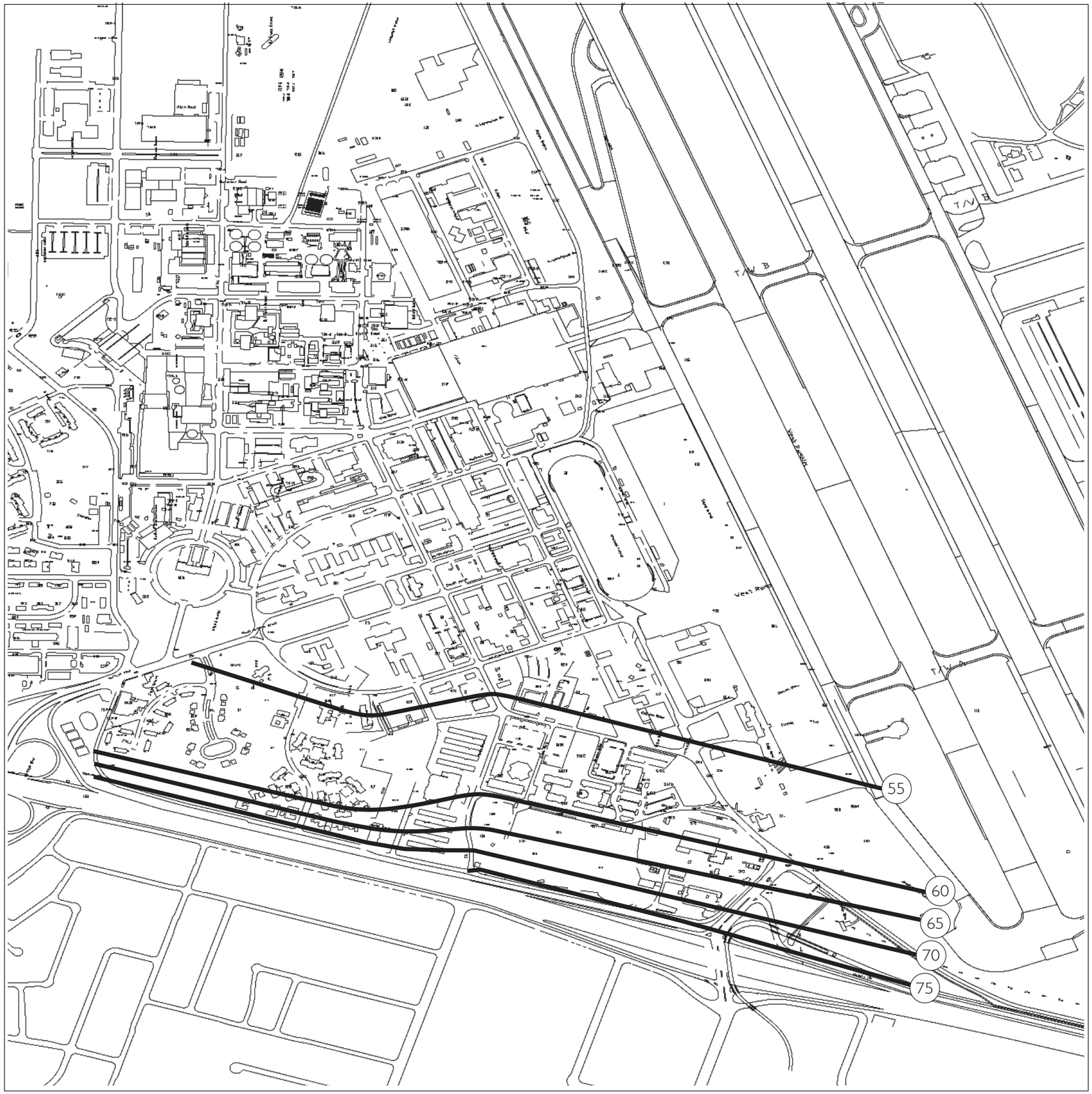
FIGURE 3.10-9

AMBIENT HIGHWAY 101 TRAFFIC
ANNUAL Ldn NOISE EXPOSURE CONTOURS (dB)



0 76m 152m 305m

0 250ft 500ft 1000ft

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FIGURE 3.10-10

COMPOSITE ANNUAL Ldn NOISE EXPOSURE CONTOURS(dB)

Source: Illingworth & Rodkin, Inc.

FIGURE 3.10-11

HYBRID ROCKET FUEL TEST FACILITY NOISE LEVELS

Source: Illingworth & Rodkin, Inc.

Measurement Results

No.	Location	A-Weighted Sound Level (dBA)
1	OARF Control Room	102
2	Corner of Lindberg Road and Rocket Test Facility Driveway	100
3	North Perimeter Road at DART Facility	62
4	Stevens Creek Trail Gate	73
5	Front of Logistics Supply Facility	76
6	Gate to N254	91

Note: These results are from a specific test September 24, 2001. The duration of this test was approximately 10 seconds. Noise at this facility varies with the type and duration of test.

N

0 76m 152m 305m

0 250ft 500ft 1000ft

3.11 AESTHETICS

This section describes the current aesthetic character of Ames Research Center, the remainder of Moffett Field, and areas surrounding it in Mountain View and Sunnyvale. The analysis focuses on the visual character of these two areas, and on the views into and out of Ames Research Center.

A. Visual Character of Ames Research Center

This section describes the existing visual character of each of the four planning areas within Ames Research Center. Because of their heterogeneous character, several of the planning areas have been divided into multiple visual units.

1. NASA Research Park Area

The NASA Research Park area is roughly triangular, and can be divided into a number of distinct visual units, each with its own character, landscaping, and typical uses. The discussion that follows describes each of these units individually. Figure 3.11-1 shows the location of the visual units within the NASA Research Park.

a. Visual Unit 1: Western End of Shenandoah Plaza

The original plan for Shenandoah Plaza is clearly discernible and largely unchanged in this unit. Views are shown in Figure 3.11-2. The street grid still outlines a generous horse-shoe shaped central lawn surrounded by attractive historic Spanish Colonial Revival buildings, with their characteristic plain stucco walls, low-pitched red tile roofs, and terra cotta ornamentation. The formal axis of the lawn sweeps eastward unchecked to the Administration Building, pointing towards the immense streamlined form of Hangar 1. In addition to the lawn, the original design's rows of mature liquid amber trees have been preserved, and these two landscape elements combine to give the western end of Shenandoah Plaza a formal, park-like feel quite distinct from the surrounding landscape.

b. Visual Unit 2: Eastern End of Shenandoah Plaza

In the eastern half of the Shenandoah Plaza area, the original site plan is much less clear. Views are shown in Figure 3.11-3. This area was originally

designated as the industrial area of Shenandoah Plaza. Although historic original Spanish Colonial Revival structures remain, a large number of infill structures have been built in the stretch of land between the western end of Shenandoah Plaza and Hangar 1. These infill buildings are generally unobtrusive, but they are much smaller than the original buildings. They are predominantly used for storage and light industrial uses, and so are much more utilitarian in design than the historic structures. They are also placed more closely together. There are only minimal trees and landscaping in this unit. There is a small monument and plaza west of Building 3; the only other open space is a number of medium-sized parking lots.

c. Visual Unit 3: Southeastern Perimeter of the NASA Research Park Area
The outer perimeter of the southern part of the NASA Research Park area is characterized by sizeable open areas: the undeveloped land alongside the airfield that supports a small burrowing owl population, the undeveloped land between Cody Road and the new light rail station, the open expanse of asphalt of the California Air National Guard motor pool lot, and the broad turf area of the athletic fields that abut Highway 101, as shown in Figure 3.11-4. Unlike in Shenandoah Plaza, these open spaces are not formally landscaped, nor are they the central organizing features of the built environment around them. They do contribute to the NASA Research Park area's less built-up feel, and allow views east to the hangars and west to the coastal hills. The California Air National Guard motor pool lot and the recreation area adjacent to Highway 101 will be developed as part of the baseline.

d. Visual Unit 4: The Barracks
A roughly "L"-shaped group of barracks makes up the fourth visual unit in the NASA Research Park area, which is characterized by a dense clustering of bar-shaped buildings. Typical barracks are shown in Figure 3.11-5. The northern four buildings are empty, while the southern four are occupied by the 129th Army Reserve Command. The line of barracks that runs north-south is two stories tall and covered with white stucco. The buildings along the east-west arm of the "L" are three-story, gray concrete block structures with access from an outside corridor that runs the length of each building on each floor. These

FIGURE 3.11-1

LOCATION OF VISUAL UNITS

1. Western End of Shenandoah Plaza
2. Eastern End of Shenandoah Plaza
3. Southeastern Perimeter of the NASA Research Park Area
4. The Barracks
5. Exchange Area
6. Main Entry
7. Ames Campus
8. Bay View and North of Bay View
9. Stormwater Retention Pond
10. The Airfield
11. CANG Area
12. Hangars 2 and 3
13. The Golf Course and Munitions Bunkers
14. Berry Court Military Housing Area
15. Orion Park Military Housing Area
16. Military Office and Hotel Buildings
17. Undeveloped Land to the West
18. Office/Industrial Park to the Northwest
19. Mobile Home Park to the Northwest
20. North to the San Francisco Bay
21. The Lockheed Martin Complex
22. Residential Neighborhood Across Highway 101
23. Mixed-Use Strip Across Highway 101
24. Whisman Industrial Area Across Highway 101
25. The Sunnyvale Municipal Golf Course

— — Ames Research Center Property Boundary

N

0 76m 152m 305m

0 250ft 500ft 1000ft

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FIGURE 3.11-2

VISUAL UNIT I
WESTERN END OF SHENANDOAH PLAZA

FIGURE 3.11-3

VISUAL UNIT 2
EASTERN END OF SHENANDOAH PLAZA

FIGURE 3.11-4

VISUAL UNIT 3
SOUTHEASTERN PERIMETER OF THE NASA RESEARCH PARK

FIGURE 3.11-5

VISUAL UNIT 4
THE BARRACKS

buildings are normally used as short-term housing for students, reservists and visitors. Both sets of buildings are typical of the plain, functional style characteristic of most military architecture. Each of the barracks buildings is surrounded by open lawn. Streets and parking lots in this visual unit are edged with mature trees.

e. Visual Unit 5: Exchange Area

The various buildings associated with the DECA Commissary and the Navy Exchange are large, plain, architecturally undistinguished one-story buildings. Each is surrounded by a large parking lot with no internal landscaping, as shown in Figure 3.11-6. There are no historic buildings in this unit, and very little landscaping. Some undeveloped land remains, but most open space is covered in asphalt.

f. Visual Unit 6: Main Entry

With the exception of the historic gate house and iron fence, all of the buildings within this unit are modern and do not contribute to the Shenandoah Plaza Historic District, as shown in Figure 3.11-7. Much of this unit consists of U.S. Space Camp, most of which is cut off from the rest of Ames Research Center by a tall fence. Within the U.S. Space Camp compound, buildings are typically one-story high and clad in white metal with blue accenting. There is no significant landscaping within this visual unit.

2. Visual Unit 7: Ames Campus Area

To the northwest of the NASA Research Park area is the Ames Campus Area, NASA's original base of operations at Moffett Field. Views are shown in Figure 3.11-8. The Ames Campus area is densely-developed with almost one-hundred laboratory and office buildings on 95 hectares (234 acres) of land. Most of the buildings are utilitarian, unpainted concrete office and lab buildings constructed in the 1940s and 1950s. The majority of these buildings are two-stories tall, though there are a few one-story structures, and a smaller number of taller three- to four-story buildings. In addition to the concrete structures, there are numerous temporary trailers that house offices.

Perhaps the most striking features of the built landscape within the Ames Campus area are the wind tunnel complexes, some of which tower up to 25 meters (80 feet) above the ground. Their gigantic, unusual shapes give a distinctly industrial feel and an entirely different scale to this visual unit.

Within the Ames Campus area, streets are generally wide with generous planting strips on each side and allées of mature street trees, often plane trees. Parking lots are generally narrow and skirt the edges of buildings. Where larger parking lots occur, there is significant interior landscaping.

3. Visual Unit 8: Bay View and North of Bay View

Visual Unit 8 sits within the 100-year flood plain, and is almost entirely undeveloped. Facilities here are limited to the 12 meter (40 feet) tall steel frame of the Outdoor Aerodynamic Research Facility (OARF), soon to be removed, and a few small one or two-story concrete structures housing telecommunications equipment. Views are shown in Figure 3.11-9. The southern portion of the visual unit is undeveloped upland grassland habitat, with a small amount of seasonal wetlands, skirted by 4 meter (12-foot) high earthen berms along Stevens Creek to the west, and the airfield to the east. The northern portion of Visual Unit 8 consists of the Eastern and Western Diked Marshes, low open areas of wetlands bordered by roads. The dominant features of this visual unit are the expanse of low vegetation, and views across it to the development off of Shoreline Drive in Mountain View, the Ames Campus area, and the airfield.

4. Visual Unit 9: Stormwater Retention Pond

Visual Unit 9 is located northwest of the airfield and north of the Diked Marshes. Views are shown in Figure 3.11-10. It is divided from the latter by North Perimeter Road and the security fence. There are a few small structures along the southern edge, but the main features of this visual unit are a border of upland vegetation along north perimeter road, wide expanses of water in the stormwater retention pond, the western portion of which is owned by the Midpeninsula Regional Open Space District (MROSD). There are views across the road and pond to the East Bay Hills.

FIGURE 3.11-6

VISUAL UNIT 5
EXCHANGE AREA

FIGURE 3.11-7

VISUAL UNIT 6
MAIN ENTRY

FIGURE 3.11-8

VISUAL UNIT 7
AMES CAMPUS AREA

FIGURE 3.11-9

VISUAL UNIT 8
BAY VIEW AND NORTH OF BAY VIEW

FIGURE 3.11-10

VISUAL UNIT 9
STORMWATER RETENTION POND

5. Eastside/Airfield

This section describes the current visual character of the Eastside/Airfield development area. The Eastside/Airfield area is roughly triangular and is bordered by the airfield to the southwest, the Lockheed Martin complex to the east, and the Cargill Salt Ponds to the north.

a. Visual Unit 10: The Airfield

The airfield is an open expanse of concrete and grass median strips consisting of the Airfield and the undeveloped land adjacent to its southern end, as shown in Figure 3.11-11. The two runways are 60 meters (200 feet) wide, and 2,800 meters (9,200 feet) and 2,500 meters (8,100 feet) long respectively. The airfield divides the built-up western portion of Ames Research Center from the far less developed northeastern portion, and allows expansive views across the Center to Hangars 2 and 3 and the San Francisco Bay.

b. Visual Unit 11: CANG Area

The CANG area is roughly triangular in shape, with its two long sides delineated by Macon Road and the Lockheed Martin Complex to the east, and East Patrol Road to the northeast. The short, southern end of the triangle runs roughly parallel to the end of the runways. The area has buildings with adjacent land adequate for CANG to consolidate and construct mission essential facilities. Trees are numerous on the land, grass areas are sprinkled, medians have been landscaped, and land awaiting development has been left in its natural form. Open land is either airfield safety zones, identified for future facilities, identified for burrowing owls, recreation, or restricted areas necessary to maintain security.

c. Visual Unit 12: Hangars 2 and 3

The Hangar area is bordered by the CANG area to the south, Macon Road to the east and north, and the airfield to the west. It is almost entirely paved, and the dominant visual feature is the elegant parabolic form of the two historic hangars, as shown in Figure 3.11-13. There are also a number of small, architecturally-undistinguished buildings housing maintenance and repair

facilities. There are usually a number of military planes and helicopters on the pavement adjacent to the hangars.

d. Visual Unit 13: The Golf Course and Munitions Bunkers
The Golf Course area is bordered by East Patrol Road to the southeast, the Cargill salt ponds to the north, and the airfield and hangar areas to the west. Views are shown in Figure 3.11-14. It is characterized by the tree-lined fairways of the golf course and the raised mounds of the munitions bunkers. It is also home to a second parking area for recreational vehicles, and an electrical station. The golf course is skirted by undeveloped ruderal land.

B. Visual Character of the Remainder of Moffett Field

This section describes the visual character of the areas of Moffett Field not under NASA administration, and thus outside Ames Research Center: the Berry Court and Orion Park Military Housing Areas.

1. Visual Unit 14: Berry Court Military Housing Area

The Berry Court Military Housing area is tucked into a roughly triangular area between the barracks area, Highway 101, and the Space Camp compound. Views are shown in Figure 3.11-15.

The Berry Court Military Housing area has three distinct neighborhoods. The westernmost area consists of two-story wooden duplexes with attached carports. Exterior walls are painted white and are not ornamented. Roofs are low-pitched with reddish-brown shingles. Groups of three duplexes are clustered onto "U"-shaped courts that extend off of the central curvilinear road, which ends in a cul-de-sac. Each building is surrounded by open expanses of lawn, the primary feature of the landscape. There are also a few mature trees in front of each building.

FIGURE 3.11-11

VISUAL UNIT 10
THE AIRFIELD

FIGURE 3.11-12

VISUAL UNIT I I
CANG AREA

FIGURE 3.11-13

VISUAL UNIT 12
HANGARS 2 AND 3

FIGURE 3.11-14

VISUAL UNIT 13
THE GOLF COURSE AND MUNITION BUNKERS

FIGURE 3.11-15

VISUAL UNIT 14
BERRY COURT MILITARY HOUSING AREA

The central housing area, Berry Court, is part of the Shenandoah Plaza Historic District. These nine beautiful Spanish Colonial Revival residences are military officers' housing. All exterior walls are stucco painted a dark beige. There is minimal ornamentation around doors and windows; otherwise the buildings are quite plain. Roofs are low-pitched and covered in red tiles. Each house has an enclosed garage connected by an arcaded breezeway. Houses are placed symmetrically along a curvilinear road which ends in a large cul-de-sac with a broad oval green at its center.

The easternmost housing area is much larger than the other two. Here white two-story wooden buildings are divided into four-plexes with shared carports. Each unit has its own front patio with a wooden fence shielding it from view. Again, buildings are arranged in clusters off a central, curvilinear road. Instead of ending in a cul-de-sac, the main road continues on to connect to South Perimeter Road and the southern edge of Ames Research Center.

2. Visual Unit 15: The Orion Park Military Housing Area

The Orion Park Military Housing area is a roughly rectangular area bordered by Highway 101, Moffett Boulevard Extension, the Ames Campus area and Stevens Creek. Views are shown in Figure 3.11-16. Like the Berry Court Military Housing area, it has several distinct neighborhoods: Orion Park, and Macon Terrace II and III. Throughout, streets are curvilinear and two-lane, often with on-street parking. From the Orion Park Military Housing area, most of Ames Research Center is screened from view by landscaping, and by the 40- by 80-Foot Wind Tunnel and an electrical substation within the Ames Campus, the only portions of ARC that are visible. The description that follows describes the four neighborhoods within the Orion Park Military Housing area from north to south.

Orion Park, the northern edge of this visual unit, is characterized by white two-story wood and stucco buildings divided into six-plexes with low sloping red shingle roofs. Covered carports face the street. Each unit has its own front patio with a wooden fence shielding it from view. Buildings are arranged in U-shaped or rectangular clusters, each of which has a central green space.

Additional open spaces face the other sides of the units, many with play areas for children. Orion Park's border with the Ames Campus area is characterized by large open playing fields. There are numerous trees in this area, mostly evergreens. Otherwise, the landscape is dominated by open expanses of lawn.

Macon Terrace III is characterized by three-story, six-unit apartment buildings. These buildings are all white stucco with brown wooden fences at ground level, and brown balconies above. Each building has attached stucco car ports. The majority of the area is given over to two rows of these buildings, facing each other across a long linear greenway with play and barbecue facilities. The landscape here is characterized by grass and a variety of deciduous and evergreen trees.

Macon Terrace II faces the apartment buildings in Macon Terrace III across Stevens Street. It has two distinct areas. Currently, it is characterized by one- and two-story attached buildings with wood siding. These buildings alternate between one-story duplexes and six-unit buildings with a one-story unit on each end, and four two-story units in between. Paint colors alternate between white and cream. Each unit has a large yard with a wood fence. The only parking is on the street. Streets in this area are lined with an allée of mature deciduous trees. There is also a long linear park running between the two rows of housing. The landscape here is characterized by grass and deciduous trees.

Housing in the southern part of Macon Terrace II is predominantly two-story attached units in a variety of combinations including duplexes, four-plexes, and eight-plexes. There are also a number of the three-story, six-unit apartment buildings described above in Macon Terrace III. All of the buildings are white stucco with attached stucco carports. The landscape consists of grass and a combination of evergreen and deciduous trees.

3. Visual Unit 16: Military Office and Hotel Buildings

The final area in this visual unit is made up of military-associated uses: the Navy Lodge, the San Jose Military Processing Center, and the offices of the 129th Medical Squadron. Views are shown in Figure 3.11-17. This area

FIGURE 3.11-16

VISUAL UNIT I5
ORION PARK MILITARY HOUSING AREA

FIGURE 3.11-17

VISUAL UNIT 16
MILITARY OFFICE AND HOTEL BUILDINGS

resembles Visual Unit 5, with isolated buildings set in large parking lots. The buildings are plain stucco and concrete aggregate, and their primary decoration comes from banks of windows which accent the buildings' vertical or horizontal character.

C. Visual Character of the Surrounding Area

This section describes the current visual character of the areas surrounding Ames Research Center in Mountain View and Sunnyvale.

1. Visual Unit 17: Undeveloped Land to the West

Immediately to the west of Ames Research Center is Stevens Creek. The Creek is bordered by tall, mostly unvegetated dirt levees. A narrow asphalt recreational trail runs along the top of the western levy. Towards the center of Ames Research Center's boundary, a long, narrow Christmas tree farm abuts the Creek. Together, the Creek and the farm create a natural/agricultural buffer zone between Ames Research Center and Mountain View, as shown in Figure 3.11-18.

2. Visual Unit 18: Office/Industrial Park to the Northwest

Beyond this buffer strip is an office and light-industrial development characterized by predominantly two-story buildings in a mix of architectural styles, as shown in Figure 3.11-19. Most of the buildings are constructed of concrete, although there are a number of brick buildings, and a few buildings faced with wood. In most cases, buildings are set back with parking lots adjacent to the street. Main building entrances are generally off of these lots rather than the street. Most of the buildings date from the 1970s and 1980s, though there are some large new complexes of two- to three-story post modern buildings, especially along Shoreline Boulevard and L'Avenida. Very little vacant land remains within the current boundaries of the developed area, and the large open tracts in the eastern section are currently being developed. Exterior wall and roof colors are generally neutral, though most of the new buildings have brightly-colored accents.

Within this office/light-industrial visual unit, streets are landscaped, often with mature trees, and there is usually minor landscaping around buildings and within larger parking lots. Most of the area is visually shielded from Ames Research Center by a hedgerow of tall, bushy oleander and other similar plants.

3. Visual Unit 19: Mobile Home Park to the West

Towards the southern edge of the office/industrial area is a densely-settled mobile home park with more than 350 homes on 15 hectares (37 acres), as shown in Figure 3.11-20. All but one of the homes are one-story. Roads are quite narrow. There is some small-scale landscaping around individual units, and large palm trees at a few intersections. The entire development is bordered by a dense oleander hedge.

4. Visual Unit 20: North to the San Francisco Bay

To the north, Ames Research Center is bordered by the extensive open expanse of the Cargill salt ponds. To the northwest is Mountain View Shoreline Park. A strip of US Fish & Wildlife Service Preserve extends northeast from the end of the eastern air strip. A figure showing views of this area was not considered warranted and is therefore not included in this EIS.

5. Visual Unit 21: The Lockheed Martin Complex

To the east, Ames Research Center is bordered by the Lockheed Martin Complex. Views are shown in Figure 3.11-21. This sprawling complex of office and heavy industrial buildings includes a wide variety of architectural styles, most of them quite plain and industrial in appearance. Heights vary from one- to four-stories. Large areas of the complex are fenced off for security purposes, and no-trespassing signs feature prominently at all entrances. All of the buildings are surrounded by large surface parking lots with minimal landscaping. There are a few street trees, but no consistent pattern of vegetation.

6. Visual Unit 22: Residential Neighborhood Across Highway 101

Highway 101 presents a formidable visual and physical barrier between Ames Research Center and the areas on the south side of the freeway. Views of the

FIGURE 3.11-18

VISUAL UNIT 17
UNDEVELOPED LAND TO THE WEST

FIGURE 3.11-19

VISUAL UNIT 18
OFFICE/INDUSTRIAL PARK TO THE NORTHWEST

FIGURE 3.11-20

VISUAL UNIT 19
MOBILE HOME PARK TO THE NORTHWEST

FIGURE 3.11-21

VISUAL UNIT 21
THE LOCKHEED MARTIN COMPLEX

FIGURE 3.11-22

VISUAL UNIT 22
RESIDENTIAL NEIGHBORHOOD ACROSS HIGHWAY 101

neighborhood and the soundwall are shown in Figure 3.11-22. The freeway is eight lanes wide here, and is bordered on the western end of the Center's southern edge by sound barriers on both sides.

There are a number of different uses across Highway 101 in Mountain View and Sunnyvale. To the southwest is an older residential neighborhood with a variety of housing types ranging from multi-family two-story apartment complexes to duplexes to small, one-story detached single family homes. Within the heart of the residential neighborhood, streets are wide with narrow sidewalks and mature trees on the front lawns of the houses.

7. Visual Unit 23: Mixed-Use Strip Across Highway 101

Along Highway 101 and Moffett Boulevard, the residential area described above is bordered by a mixed-use strip that includes motels, restaurants, a mobile home park, a bar, and a gas station, as shown in Figure 3.11-23. These commercial buildings are one- to two stories tall in a variety of architectural styles. Many of the buildings are set back from the street with small parking lots in front.

8. Visual Unit 24: Whisman Industrial Area Across Highway 101

Directly south of Ames Research Center in the area bordered by Middlefield, Ellis and Whisman Streets is an expansive office and industrial park area, as shown in Figure 3.11-24. There are a variety of buildings within this visual unit. There are a few older, one-story industrial buildings near the center of the area, set back from the street with mature trees along their street frontages. The majority of the unit, however, is split between two large new office developments that have Netscape and Nokia as their primary tenants. The new buildings are faced with textured concrete with some detailing on facades and recessed windows and entrances. Most of these buildings are two stories high, although some reach three stories. They are all dark beige in color, with low-pitched red-tile roofs that give them a touch of Spanish Colonial Revival style.

Parking is in large linear lots with generous but immature landscaping. Each of the lots is punctuated by the distinctive slender peaked towers of the

FIGURE 3.11-23

VISUAL UNIT 23
MIXED-USE STRIP ACROSS HIGHWAY 101

FIGURE 3.11-24

VISUAL UNIT 24
WHISMAN INDUSTRIAL AREA ACROSS HIGHWAY 101

treatment stations for the contaminated groundwater that underlies this entire area. Part of the land within this visual unit remains vacant.

9. Visual Unit 25: The Sunnyvale Municipal Golf Course

The Sunnyvale Municipal Golf Course, 14 hectares (35 acres) of which belong to ARC, is located to the southeast of Ames Research Center. Views are shown in Figure 3.11-25. This large green space provides a counterpoint to the development that surrounds it.

D. Views from Ames Research Center

Views within and out of Ames Research Center vary widely depending on location. Because the Center's topography is almost flat, even elements as small as landscaping and low buildings block most sight lines across Ames Research Center. Only the tallest structures, such as the hangars and the wind tunnels, are visible outside of their immediate area.

The main views out of Ames Research Center are of the coastal hills to the west, the Shoreline Drive development to the northwest, the Cargill Salt Ponds to the north, the East Bay hills to the east, and the Mt. Hamilton Range to the south. The nondescript architecture of the Lockheed Martin complex is also visible from the southeast side of Ames Research Center.

E. Views into Ames Research Center

The essentially flat topography of Ames Research Center extends for miles around it, so none of the areas abutting the Center have a clear view of the facilities. Lines of site into Ames Research Center are almost always obstructed by landscaping and development. Only the tallest features are visible, even from the frontage road just across Highway 101.

Of the features visible from outside Ames Research Center, by far the most striking are the towering parabolic forms of the airship hangars, each of which is nine-stories tall and encloses approximately 3 hectares (8 acres) of land. Hangar 1, the first hangar at Moffett Field, was completed in 1933 to house the dirigible, the USS Macon. It is the primary landmark within Ames Research Center and the most visible part of it from the north and west. Hangars 2 and 3, on the other side of the airfield, were constructed during World War II to house the revitalized Naval lighter-than-air program. They stand out strongly against the salt ponds that slope down to the Bay, and are especially visible from the Lockheed Martin complex and the eastern side of the Center in general. The soaring forms of the three hangars against the backdrop of the Bay have made Moffett Field one of the most distinctive landscapes in the Bay Area for more than 60 years.

The wind tunnels are the other feature of Ames Research Center visible for long distances. Given their placement on the site, they are most visible from the northwest, although it is possible to get occasional glimpses of them from the predominantly residential neighborhood to the southwest of Moffett Field across Highway 101.

All of these features are visible from parts of the coastal hills to the west, the East Bay hills to the east, and the Mt. Hamilton Range to the south.

F. Protected Trees

Santa Clara County has established a Tree Preservation and Removal Ordinance (County Code Division C16) to establish and maintain tree cover, protect property values, preserve aesthetic resources, prevent erosion, counteract air pollution, provide wind protection, maintain climatic balance, provide habitat, and to protect community and historic assets. The ordinance protects all qualified trees on both public and private land. Among other reasons, a tree of any species qualifies if it is:

FIGURE 3.11-25

VISUAL UNIT 25
THE SUNNYVALE MUNICIPAL GOLF COURSE

- A single-trunk tree with a diameter of at least 30 centimeters (12 inches), as measured at 137 centimeters (4.5 feet) above the ground or below the lowest branch, whichever is lower.
- A multiple-trunk tree with a diameter of at least 61 centimeters (24 inches), as measured 137 centimeters (4.5 feet) above the ground or below the lowest branch, whichever is lower.
- Of special significance to the community.

According to the ordinance, any tree that qualifies as a protected tree may not be removed without having first obtained a permit unless it is irreversibly diseased or dead, or if it represents a hazard. In order to obtain a permit, the applicant must submit plans that include a plan to replant trees of similar types, including native trees where the protected tree to be removed is a native.[1]

Although NASA is a federal agency and thus is not subject to the County's protected tree regulations, it has agreed to comply with them wherever possible. In order to establish which trees at Ames Research Center qualify as protected tree, NASA surveyed the entire ARC during the summer of 2001. The Berry Court and Orion Park Military Housing areas were not surveyed because they are not under NASA control. Figures 3.11-26 through 3.11-28 show the results of the tree survey. As shown in these figures, there are protected trees in all of the planning areas except the Bay View area.

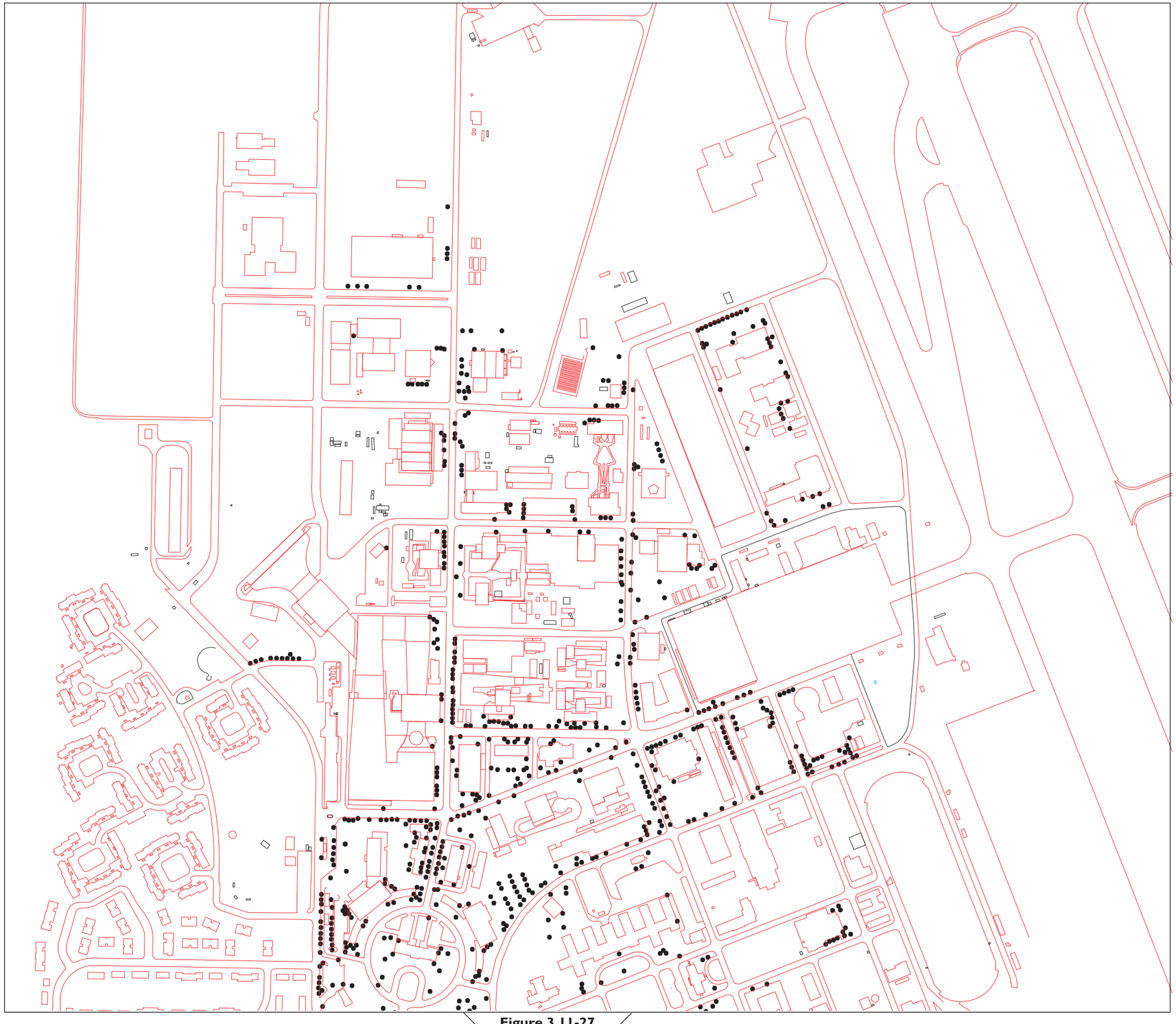
1. Ames Campus Area

In the Ames Campus area, protected trees are primarily located along streets or in planting strips in parking lots. There are also a few areas where trees are planted alongside existing buildings. Finally, there is a small number of protected trees clustered in the undeveloped area south of the administration building.

[1] Santa Clara County Ordinance No. NS-1203.107, §1, 2-11-97.

FIGURE 3.11-26

PROTECTED TREE LOCATIONS: BAY VIEW AND AMES CAMPUS AREAS



- Protected Tree

N

0 27m 55m 110m

0 90ft 180ft 360ft

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

Figure 3.11-27

Figure 3.11-26

FIGURE 3.11-27

**PROTECTED TREE LOCATIONS:
AMES CAMPUS AND
NASA RESEARCH PARK**

● **Protected Tree**

N

0 27m 55m 110m

0 90ft 180ft 360ft

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

FIGURE 3.11-28

PROTECTED TREE LOCATIONS: NOTHERN PORTION OF EASTSIDE/AIRFIELD

No protected trees exist in the southern portion of Eastside/Airfield.

● **Protected Tree**

N

0 27m 55m 110m

0 90ft 180ft 360ft

NASA AMES RESEARCH CENTER

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2. NRP Area

Within the NRP area, the pattern of protected tree distribution is not as regular as in the Ames Campus area. Within the Shenandoah Plaza Historic District, there are comparatively few protected trees, which are for the most part clustered in open space areas or grouped near buildings. The only areas where trees line a roadway are along Clark Memorial Drive, the entrance road, and a small strip along South Akron Road in front of Building 20. In the remainder of the NRP area, protected trees are primarily lining the edges of roads and parking lots, or clustered around buildings. There are a few open areas adjacent to the athletic fields along Highway 101 and next to the Exchange, where trees are more loosely grouped.

3. Eastside/Airfield Area

In the Eastside/Airfield area, protected trees are limited to the golf course, and the southernmost of the areas currently occupied by the California Air National Guard.

3.12 RECREATION

This section describes existing recreational facilities at and adjacent to Ames Research Center.

A. On-Site Recreational Facilities

This section describes existing recreational resources at Ames Research Center.

1. Ames Research Center Recreational Facilities

Under the Baseline, there will be approximately 50 hectares (123 acres) of active recreation area in Ames Research Center, of which approximately 45 hectares (112 acres) are in the golf course in the Eastside/Airfield area. The remaining 5 hectares (11 acres) consist of informal recreation areas, playing fields, a swimming pool, and picnic grounds, as well as more natural areas which are used for walking. There are also approximately 170 hectares (425 acres) of undeveloped land in the Bay View and North of Bay View areas, where NASA employees use the roads for recreational purposes. The total area of recreational and open space areas within Ames Research Center is approximately 215 hectares (535 acres).

In addition to parks and open space areas, NASA has developed the Bicycle Commute Trail, a bicycle and pedestrian path that extends from the Stevens Creek Regional Trail to the Wright Avenue Gate (Gate 17) of Ames Research Center.

B. Off-Site Recreational Facilities

This section describes off-site recreational facilities in the vicinity of Ames Research Center.

1. Recreational Areas Near Ames Research Center

As shown on Figure 3.12-1, there are a number of parks and recreational areas near enough to Ames Research Center that they are likely to be used by current and future employees and residents.

a. Berry Court and Orion Park Military Housing Recreational Facilities

Within the Berry Court and Orion Park Military Housing areas, there are a number of recreation areas. These include baseball diamonds and basketball courts, the Youth and Teen Center, and playground facilities scattered throughout the housing areas. There is also a par course facility to the south of the Senior Officer's Quarters, located in the eastern annex.

b. Shoreline at Mountain View

Shoreline at Mountain View is a Regional Recreational and Wildlife area adjacent to San Francisco Bay in Mountain View. Its 280 hectares (700 acres) offer a sanctuary for wildlife and migratory birds, a network of hiking and biking trails, a restored Victorian Home built by Henry Rengstorff in 1867, a championship golf course, a 20-hectare (50-acre) salt water sailing lake, and a meadow area for picnics and play.

c. San Vernon Park

San Vernon Park is a 0.8-hectare (2-acre) park in Mountain View that includes a basketball court, playground, picnic area and an outdoor volleyball court.

d. Stevenson Park

Stevenson Park is a 5-hectare (12-acre) park in Mountain View that includes a basketball court, a playground, a soccer/football field, a picnic area, a softball field and tennis courts.

e. Whisman Park

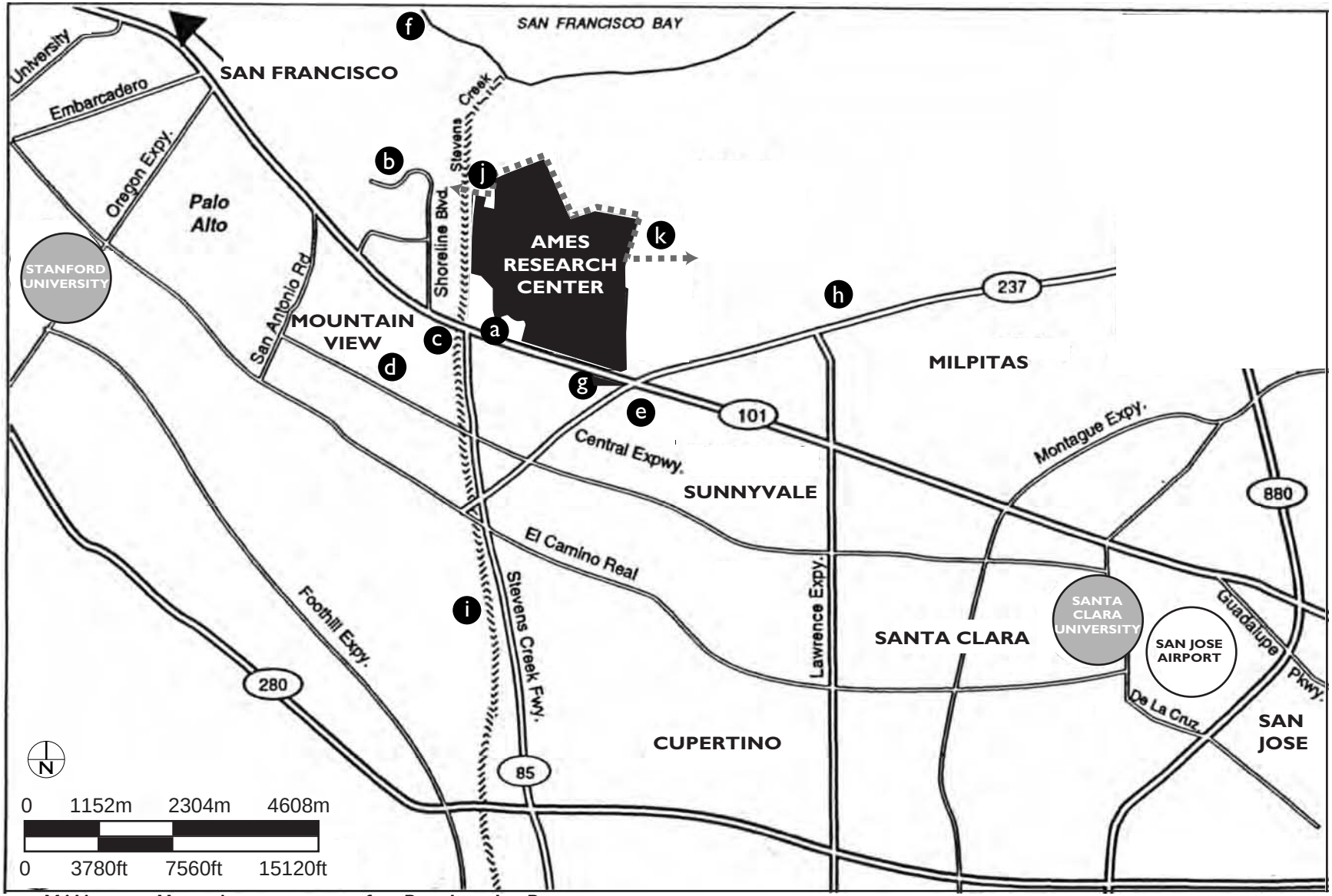
Whisman Park is a 5-hectare (12-acre) park in Mountain View that includes BBQ facilities, a basketball court, playground, a soccer/football field, a softball field, tennis courts, an outdoor volleyball court and trail access.

f. Baylands Preserve

The Baylands Preserve is bounded by Mountain View and East Palo Alto. The 785-hectare (1,940-acre) preserve is the largest tract of undisturbed marshland in the San Francisco Bay. It includes 24 kilometers (15 miles) of multi-use trails.

FIGURE 3.12-1

PARKS IN THE VICINITY



a. Military Housing
b. Shoreline At Mountain View
c. San Veron Park
d. Stevenson Park
e. Whisman Park
f. Baylands Preserve
g. Sunnyvale Golf Course
h. Baylands Park
i. Steven Creek Trail
j. Stevens Creek Shoreline Nature Study Area
k. Planned Bay Trail

g. Sunnyvale Municipal Golf Course

The Sunnyvale Municipal Golf Course is 18 holes and approximately 80 hectares (200 acres) in size, 15 hectares (35 acres) of which is part of Ames Research Center.

h. Baylands Park

Baylands Park is a regional park in Sunnyvale with over 30 hectares (70 acres) of developed parkland including play areas, picnic areas, Baylands Grove Amphitheater and connections to the Bay Trail. There are an additional 40 hectares (105 acres) of season wetlands that are protected as a wetlands preserve.

i. Stevens Creek Trail

Stevens Creek Trail is a heavily-used feeder trail for the Bay Trail. It starts at Landels Park in Mountain View, then follows Stevens Creek all the way to the Bay Trail, in the process running through dense urban neighborhoods and high-tech business parks, and along the western edge of Ames Research Center.

j. Stevens Creek Shoreline Nature Study Area

This is a Midpeninsula Regional Open Space District (MROSD) nature preserve. Access to the western edge of the preserve is via a pedestrian bridge from Shoreline Park.

2. The Bay Trail

The Bay Trail is a planned recreational corridor that, when complete, will encircle San Francisco and San Pablo Bays with a continuous 650-kilometer (400-mile) network of bicycling and hiking trails. To date, approximately 340 kilometers (210 miles) of the alignment have been completed. Senate Bill 100, authored by then-state Senator Bill Lockyer and passed into law in 1987, directed the Association of Bay Area Governments (ABAG) to develop a plan for this "ring around the Bay," including a specific alignment for the Bay Trail. The Bay Trail Plan, adopted by ABAG in July 1989, includes a proposed alignment; a set of policies to guide the future selection, design and implementation of routes; and strategies for implementation and financing.

Since the adoption of the Bay Trail Plan, the majority of the jurisdictions along the Bay Trail alignment have passed resolutions in support of the Bay Trail and have incorporated it into their General Plans.

In 1990, the San Francisco Bay Trail Project was created as a nonprofit organization dedicated to planning, promoting and advocating implementation of the Bay Trail. The Bay Trail Project is administered by ABAG and is housed at ABAG's offices in Oakland.

The planned Bay Trail alignment runs through the northern portion and along the northern boundary of Ames Research Center, but has not yet been constructed in this area.

3.13 CULTURAL RESOURCES

This section describes the archaeological and historical resources that remain at Ames Research Center.

A. Archaeology

The following discussion of archaeological resources at Ames Research Center is based on the *Archaeological Overview and Survey, Naval Air Station Moffett Field, Santa Clara County, California and Naval Auxiliary Landing Field Crows Landing, Stanislaus County*, by Basin Research Associates, Inc., December 1991, which are incorporated into this EIS by reference.

Archaeological research suggests that the southern shore of the San Francisco Bay has been inhabited continuously for up to 4,000 years. In the early years of European settlement, Ames Research Center was within the boundaries of the Ohlone tribal area. Based on archaeological data and mission records, researchers have estimated that in 1770 there were approximately 1,400 Native Americans living on the Peninsula. It appears that a number of different groups may have had temporary camps in or near what is now Ames Research Center during pre-settlement and early settlement years. By 1810, the traditional Ohlone way of life seems to have disappeared due to introduced diseases, declining birth rates, and the impact of the mission system, which transformed gatherers and hunters into agricultural laborers and craft artisans.

Although the area around Ames Research Center continued to be settled in the early part of the 19th century, the patterns of use changed. The economy began to focus on the growth of agricultural crops and the transportation of those crops to market through a series of landings and associated warehouses along the Bay. Most of the land that Ames Research Center sits on was originally part of the Rancho Posolmi, which was granted to Lopez Indigo, or Ynigo, a Native American, in 1844 by then governor Micheltorena. Ynigo and other Native Americans are known to have farmed the property from at least 1834 through 1864.

There appear to have been a small number of homes and other structures within what is now Ames Research Center by the late 1900s, but no historic archaeological sites associated with early European development have ever been located at Ames Research Center.

Ames Research Center has been extensively surveyed for archaeological remains, and ten formally-recorded prehistoric and historic archaeological sites have been reported within its boundaries. Most of the sites were recorded in 1912 by Loud. Little information about these sites exists and boundaries are not known. A 1991 report concluded that it is no longer possible to find any evidence of these archaeological sites within Ames Research Center itself. The sites appear to have been seriously disturbed or destroyed by agriculture, fill, and development over the course of the century. Because of the level of site disturbance, none of the archaeological sites previously recorded at Ames Research Center are considered significant enough to be included in the National Register of Historic Places.[1] Additionally, a record search has indicated that no new studies have identified archaeological sites at ARC since 1991. Figure 3.13-1 identifies potential archeologically sensitive areas within Ames Research Center.

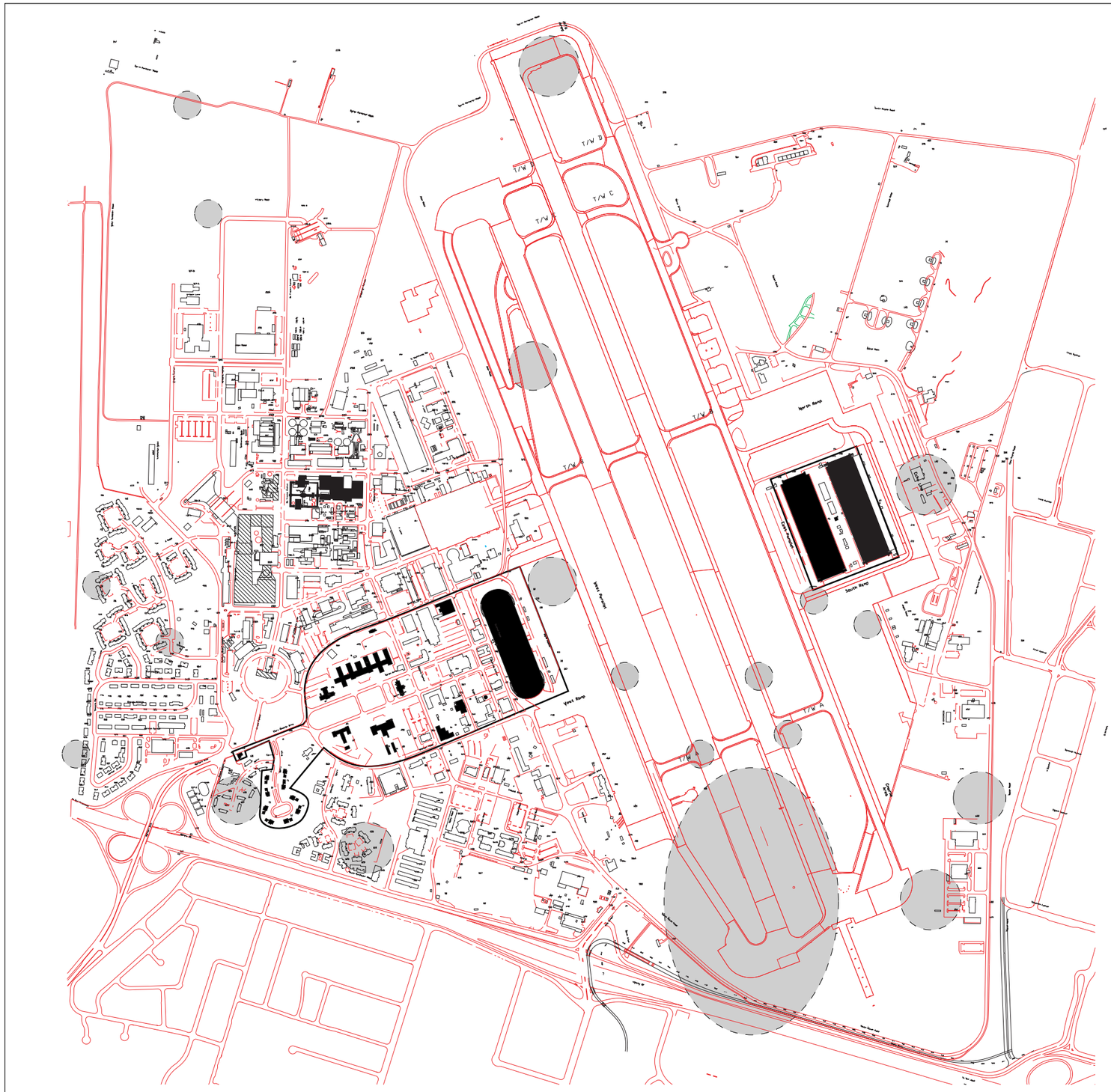
B. Historic Resources

This discussion of historic resources at Ames Research Center is based on the *NASA Ames Research Center Historic Resources Protection Plan for portions of Moffett Field, California* by NASA, March 2001 and the *NASA Ames Research Center Section 106 Survey*, November 28, 1995, both of which are incorporated by reference into this EIS, and on the following surveys.

[1] Basin Research Associates. *Archaeological Overview and Survey*. 1991

FIGURE 3.13-1

CULTURAL RESOURCES



- Historic Building Listed on the National Register of Historic Places
- Building Nominated for Listing on the National Register of Historic Places
- Historic District
- Potential Archeologically-Sensitive Area

N

0 76m 152m 305m

0 250ft 500ft 1000ft

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Several surveys of historic resources have been undertaken at Ames Research Center to determine buildings' eligibility for listing on the National Register of Historic Places (NRHP). In 1984, the National Park Service did a survey of NASA centers. As a result of this survey, the Unitary Plan Wind Tunnel Complex was listed on the NRHP as a historic landmark.

In 1991, a Section 106 survey was conducted by the Navy on a subset of buildings at Moffett Field and the Crows Landing Naval Auxiliary Landing Field. The historic context of this survey was the 1930 to 1935 (military) and 1942 to 1946 (engineering) periods. A total of 43 buildings and structures were determined to be eligible for NRHP listing, all at Moffett Field. The area encompassed by the 43 eligible buildings/structures was named Shenandoah Plaza in honor of the first American dirigible. In 1994, the Shenandoah Plaza National Historic District was listed on the NRHP.

In 1995, a Section 106 review was conducted by NASA for 19 buildings within the Ames Campus area built before 1950. A total of three structures were found to be eligible for NRHP listing: the ARC Administration Building (N-200), the 40- by 80-Foot Wind Tunnel (N-221), and the 6- by 6- Foot Supersonic Wind Tunnel (N-226). These buildings are currently being nominated to NRHP.

In 1999, Science Applications International Corporation conducted a survey for NASA of all buildings at Ames Research Center dating from the Cold War era, 1946 to 1989. This survey of 124 buildings concluded that none of the Cold War-era buildings at Ames Research Center reached the level of exceptional significance required under the criteria for cold war significance (Criteria G) to make them eligible for the NRHP.

In 2000, Lorie Garcia of Beyond Buildings conducted a Section 106 survey for NASA of Buildings 148 through 156, 158, and 167, none of which was found to be eligible for listing on the NRHP.

In 2001, a Section 106 survey was conducted for NASA by Architectural Resources Group of Buildings N-204, N-204A, N-205, N-206, N-207A, N-208, N-209, N-222, N-223, and N-218A in the Ames Campus area, all of which were approaching 50 years of age. None were found to be eligible for listing.

1. Shenandoah Plaza Historic District

The majority of the historic resources within Ames Research Center are part of the Shenandoah Plaza Historic District (SPHD). The SPHD also includes the officers' housing area of Berry Court within the Berry Court Military Housing area, which is not under NASA administration and thus is not part of the project area. Figure 3.13-1 shows the location of the SPHD and historic buildings within Moffett Field. The buildings, landscapes, and objects included in the SPHD are listed on the National Register of Historic Places because of their association with lighter-than-air technology during the inter-war period between 1932 and 1945, as described in Chapter 1 of this EIS, and because of their distinctive site plan and Spanish Colonial Revival architecture.

a. Site Plan and Landscape

The 1933 site plan, created by the Navy Department Bureau of Yards and Docks, is based on an axial layout with major administrative buildings set symmetrically along a generous 1.5-hectare (4.5-acre), horse-shoe shaped central greensward. The formal lawn sweeps eastward to the immense streamlined form of Hangar 1, which provides a majestic focal point for the SPHD and for Ames Research Center as a whole.

The landscaping is another particularly striking aspect of the original site plan. The original design's broad expanses of lawn and rows of mature liquid amber trees have been preserved, and give the SPHD a formal, park-like feel quite distinct from the surrounding landscape of the Baylands.

b. Contributing Buildings

There are 43 historic buildings within the SPHD, 25 of which are within Ames Research Center (the others are within the Berry Court Military Housing area). Table 3.13-1 lists the NASA-controlled contributing buildings within the

Shenandoah Plaza NRHP District. Figure 3.13-1 identifies the contributing buildings within Ames Research Center.

The Spanish Colonial Revival style dominates, with its neutral colors, red tile roofs, terra cotta ornamentation and almost residential proportions. Buildings in the SPHD are typically two-stories tall, with low-pitched, slightly-hipped rooflines. Exterior walls are consistently quite plain, except for a string course around the entire perimeter of each building separating the first and second floors. Windows are simple rectangular shapes, vertically-oriented, multi-paned and double-hung. Flowery terra cotta ornamentation defines the major front and back entrances, and often some of the most prominent windows.

The remainder of the 49 buildings within the Shenandoah Plaza Historic District are all considered non-contributing.

c. Key Historic Resources

Of the historic buildings within the Historic District, the most striking are the Administration Building (Building 17), which sits at the head of Shenandoah Plaza, the Bachelor Officers Quarters (Building 20), and the original hangars, especially Hangar 1.

The almost 1,800 square meter (19,000 square foot) Administration Building, constructed in 1933, follows the typical architectural pattern of the original campus design: two-stories high, with stucco walls, red tile roofing, and terra cotta ornamentation. It is the most prominently sited building within the original 1933 campus plan. Unlike the other buildings in the SPHD, the Administration Building's primary entrance projects out from the main structure, with a triple round-arched entrance. The detailing around the major entrances and windows includes ornamental urns, pilasters, and floral sculpture that counterpoint the austere, shallow cruciform shape of the building. There is also a small centered bell tower with flat arches on each of its faces, capped by a small red dome.

TABLE 3.13-1 **SHENANDOAH PLAZA HISTORIC DISTRICT CONTRIBUTING STRUCTURES**

Building Number	Building Name/ Historic Use	Year Built	Within Study Area
Hangar 1	Hangar 1	1933	Y
46	Hangar 2	1943	Y
47	Hangar 3	1943	Y
2	Balloon Hangar	1933	Y
5	Water Tower	1933	Y
10	Heat Plant	1933	Y
15	Fire Station/ Laundry	1933	Y
16	Locomotive Crane Shed	1933	Y
17	Admirals Building	1933	Y
18	Aerological Center	1933	Y
19	Bachelor Enlisted Quarters	1933	Y
20	Bachelor Officers Quarters	1933	Y
21	Bachelor Officers Garage	1933	Y
22	Bachelor Officers Garage	1933	Y
23	Dispensary	1933	Y
24	Ambulance Garage	1933	Y
25	Bowling Alley/Theater	1933	Y
26	Gate House/Iron Fence	1933	Y
32	Floodlight Tower	1933	Y
33	Floodlight Tower	1933	Y
37	Scale House	1933	Y
40	Flagpole	1933	Y
55	Heat Plant for Hangars 2 and 3	1943	Y
NA	Commons	1933	Y
NA	Anchor	NA	Y

Source: NASA Ames Research Center HRPP, 2000

The Bachelor Officers Quarters (Building 20), constructed in 1933, is also a large two-story structure in the typical Spanish Colonial style of the SPHD buildings. It sits on the south side of the plaza where the central green widens outwards, facing the equally prominent but less architecturally impressive Bachelor Enlisted Quarters. The Bachelor Officers Quarters has more ornamentation than other buildings in the SPHD, and a very elegant entryway of three large round arches. A rear wing projects south from the building and abuts the original 1933 officer automobile storage structures, Buildings 22 and 23.

The most significant building in the SPHD, however, is Hangar 1, which was designed in the Streamline Moderne style to emulate the sleek, ultra-modern form of the airship it was built to house rather than the Spanish Colonial Revival architecture of the rest of the original core of Moffett Field. The giant parabola of Hangar 1 towers 65 meters (211 feet) above the plaza. Constructed in 1932 through 1933, this one-story steel truss building is one of the largest non-internally supported buildings in the United States, enclosing 3 hectares (8 acres) of land. The smooth curve of its plate metal cladding is detailed on each side with bands of horizontally-oriented windows set flush in the skin. Gigantic curving doors on tracks create the north and south ends of the buildings. Hangar 1 is historically significant because of its unique use, its beautifully-executed Streamline Moderne design, its ingenious structural construction, and its size; it is still the dominant landmark in the southern San Francisco Bay Area. In addition to anchoring the Shenandoah Plaza Historic District, Hangar 1 has been designated a Naval Historical Landmark and a California Historic Civil Engineering Landmark by Section 57 of the American Society of Civil Engineering.

2. Ames Campus Historic Buildings

This section describes the historic buildings within the Ames Campus.

a. The Unitary Plan Wind Tunnel Complex

The Unitary Plan Wind Tunnel (UPWT) Complex was listed as a National Historic Landmark on the NRHP in 1984. It has also been designated an

International Historic Mechanical Engineering Landmark. The UPWT consists of three separate wind tunnels, each of which loops back to connect to the same central 260,000 hp engine. Covering 7,100 square meters (77,000 square feet), the three huge loops of metal conduit create one of the most striking architectural landmarks at Ames Research Center.

b. Other Elements

As discussed earlier, a 1995 survey of buildings in the Ames Campus area concluded that three additional buildings are eligible for listing on the NRHP: the NASA/Ames Research Center Administration Building (N-200), the 40- by 80-Foot Wind Tunnel (N-221), and the 6- by 6-Foot Supersonic Wind Tunnel (N-226). All three have been nominated to the NRHP.

The NASA/Ames Research Center Administration Building (N-200) was constructed in 1943 and dates back to the earliest years of the Center. Its importance relative to the other structures at the Center is signified by the greater degree of ornamental detail near the windows and entry, as well as its formal, symmetrical facade. As the Administration Building, it housed Ames' management during its gradual transformation from an aeronautical laboratory emphasizing high-speed wind tunnel research to the diverse and sophisticated research campus of today.

The 40- by 80-Foot Wind Tunnel (N-221) is the single most prominent landmark within the Ames Campus area. This structure is the largest wind tunnel in the world. For almost 40 years, it was a closed system tunnel. An expansion from 1979 to 1982 created an additional 80- by 120-foot test section with an open-intake air system. The wind tunnel was designed to test full-scale aircraft. It was used during the last year of World War II, and also served as the test site of the first US aircraft with a jet engine, the Ryan XFR-1.

The 6- by 6-foot supersonic wind tunnel (N-226) is the site of testing that led to significant advances in the fields of aerodynamics and space exploration by helping to solve the mysteries of flight beyond Mach 1. The supersonic wind tunnel included a feature that allowed a range of speeds from Mach 1.3 to 1.8,

and 130 cm (50-inch) glass windows for researchers to observe the flow of supersonic air around the models in the tunnel.

3.14 SOCIO-ECONOMIC CONDITIONS

This section describes the existing socioeconomic conditions around Ames Research Center. It presents information about population and employment at the regional, county, and local levels. It analyzes the local housing market. It describes the fiscal condition of the county, local jurisdictions and school districts, and Ames Research Center itself. Finally, the section concludes with a discussion of environmental justice, including race and income statistics for areas surrounding Ames Research Center.

A. Population Characteristics

This section describes regional, county and local population characteristics.

1. San Francisco Bay Area

Ames Research Center is located between the Cities of Sunnyvale and Mountain View at the southern end of the San Francisco Bay Area. The Bay Area is a major population, economic, and financial center of the western United States, and includes nine counties with a total population of 6,930,600, according to the Association of Bay Area Governments (ABAG). This population comprises approximately one fifth of California's 34 million residents. The Bay Area includes the counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. While some definitions of the Bay Area add Santa Cruz as a tenth county, this analysis adheres to a nine-county definition as set forth by ABAG.

As shown in Table 3.14-1, the Bay Area has experienced dramatic population growth over the last decade, increasing at an average annual rate of 1.4 percent between 1990 and 2000. The three largest counties – Santa Clara, Alameda, and Contra Costa – make up over 57 percent of the Bay Area population, and account for 43 percent of the region's growth during the last decade.

Over the next 15 years, ABAG projects the region will grow by approximately 13 percent to over 7.8 million people, as summarized in Table 3.14-2.

2. Santa Clara County

Santa Clara County has experienced significant population growth in recent years as a result of the high-tech industrial boom in Silicon Valley. Between 1990 and 2000, the County population grew from 1.5 million to 1.8 million, at an annual rate of 1.6 percent. This increase accounted for 28.7 percent of the entire Bay Area's growth during this period.

Santa Clara County is forecasted to add more people than any other Bay Area county over the next 15 years. ABAG projects an increase of 215,300 Santa Clara County residents between 2000 and 2015, a 12.3 percent increase. Current population data and forecasts for the county are contained in Tables 3.14-1 and 3.14-2.

The number of Santa Clara County households is also increasing, though at a slightly lower rate than the total population. Between 2000 and 2005, the County will add another 27,670 households, at an annual rate of 1.0 percent. In the next five years, Santa Clara County's household size will increase from 3.03 persons per household to 3.05 persons per household. At the time of the 1990 U.S. Census (latest data available), 59 percent of County households owned their home. This ownership rate is only slightly lower than the Bay Area rate of 60 percent.

As summarized in Table 3.14-3, the County's mean household income has increased over the last decade, reflecting the region's economic prosperity. From 1990 to 2000, Santa Clara County's mean household income grew from $70,300 to $86,300 (in constant 1995 dollars), a 19 percent increase. This growth rate is somewhat higher than the 16 percent rate in the Bay Area as a whole over the same period. County household income distribution is presented in Table 3.14-4.

Santa Clara County has a slightly younger population when compared to the Bay Area. The County's median age is 35.3 years, as compared to 36.9 for the Bay Area. Table 3.14-5 shows age data for the region, county, and local area.

TABLE 3.14-1 **POPULATION AND HOUSEHOLD TRENDS**

	1990	2000 (est.)	Average Annual Change 1990-2000
AMES RESEARCH CENTER AREA[1]			
Population[2]	184,689	212,000	1.4%
Households[2]	78,286	83,810	0.7%
Average Household Size[2]	2.35	2.51	0.7%
Employed Residents per Household[2]	1.47	1.54	0.5%
Household Type - Families[3]	57%	55%	-0.3%
Household Type - Non-Families[3]	43%	45%	0.4%
Tenure - Owner[4]	45%	NA	-
Tenure - Renter[4]	55%	NA	-
SANTA CLARA COUNTY			
Population	1,497,577	1,755,300	1.6%
Households	520,180	567,080	0.9%
Average Household Size	2.81	3.03	0.8%
Employed Residents per Household	1.56	1.64	0.5%
Household Type - Families	69%	67%	-0.3%
Household Type - Non-Families	31%	33%	0.6%
Tenure - Owner	59%	NA	-
Tenure - Renter	41%	NA	-
SAN FRANCISCO BAY AREA			
Population	6,020,147	6,930,600	1.4%
Households	2,245,865	2,438,060	0.8%
Average Household Size	2.61	2.78	0.6%
Employed Residents per Household	1.40	1.45	0.3%
Household Type - Families	65%	63%	-0.2%
Household Type - Non-Families	35%	37%	0.4%
Tenure - Owner	60%	NA	-
Tenure - Renter	40%	NA	-

Notes:
1. Ames Research Center Area includes the combined jurisdictions of Mountain View and Sunnyvale. Population and Households are totals, all other figures are a weighted average.
2. Population, Households, Average Household Size, and Employed Residents per Household data from ABAG, Projections 2000.
3. Household Type data from Claritas, Inc.
4. Tenure data from 1990 U.S. Census.

Sources: ABAG, *Projections 2000*; Claritas Inc.; 1990 US Census; Bay Area Economics, 2001.

TABLE 3.14-2 **POPULATION AND HOUSEHOLD PROJECTIONS**

	2000	2005	2010	2015	Projected Change 2000-2015
POPULATION					
Ames Research Center Area[1]	212,000	224,800	232,800	239,100	12.8%
Santa Clara County	1,755,300	1,854,000	1,919,000	1,970,600	12.3%
San Francisco Bay Area	6,930,600	7,380,100	7,631,400	7,832,600	13.0%
HOUSEHOLDS					
Ames Research Center Area[1]	83,810	87,420	90,640	93,890	12.0%
Santa Clara County	567,080	594,750	620,760	643,130	13.4%
San Francisco Bay Area	2,438,060	2,553,930	2,656,650	2,753,440	12.9%

Notes:
1. Ames Research Center Area includes the combined jurisdictions of Mountain View and Sunnyvale.

Sources: ABAG, *Projections 2000*; Bay Area Economics, 2001.

3. Ames Research Center Area

This analysis refers to the cities of Sunnyvale and Mountain View – the two jurisdictions surrounding Ames Research Center – as the "Ames Research Center area." The ARC area has a population of 212,000, and comprises approximately 12 percent of County residents. The area's population has grown rapidly over the last ten years, though at a slightly lower rate than the County. From 1990 to 2000, the ARC area saw an annual population increase of 1.4 percent, compared to the County's annual growth rate of 1.6 percent. Over the next 15 years, ABAG projects the ARC area's population to grow another 12.8 percent, adding 27,100 people.

TABLE 3.14-3 **MEAN HOUSEHOLD INCOME TRENDS**

	1990[1]	2000 (est.)	Change 1990-2000
Ames Research Center Area[2]	$63,191	$80,707	22%
Santa Clara County	$70,300	$86,300	19%
San Francisco Bay Area	$64,100	$76,400	16%

Notes:
1. All income amounts are expressed in inflation-adjusted 1995 dollars.
2. Ames Research Center Area includes the combined jurisdictions of Mountain View and Sunnyvale. Figure is the average of both cities' mean household income, adjusted for population.

Sources: ABAG, *Projections 2000*; Bay Area Economics, 2000.

The number of ARC area households is increasing at a rate of 0.7 percent a year, slightly lower than the County rate of 0.9 percent a year. The ARC area's home ownership rate is significantly lower than the County figure. Only 45 percent of ARC area households own their homes, as compared to 59 percent for the County.

Although the ARC area's mean household income is lower than the County's, it is increasing at a higher rate than the County figure. The ARC area's mean household income grew from $63,191 to $80,707 (in constant 1995 dollars) between 1990 and 2000, a 22 percent increase. In contrast, County households only experienced a 19 percent rise in mean income during the same period. ARC area household income distribution is presented in Table 3.14-4.

As shown in Table 3.14-5, the ARC area population is slightly older than the population of Santa Clara County, with a median age of 37.2 in 2000, as compared to 35.3 for the County.

TABLE 3.14-4 **ESTIMATED 2000 HOUSEHOLD INCOME DISTRIBUTION**

2000 Income	Ames Research Center Area[1]	Santa Clara County	San Francisco Bay Area
Less than $15,000	4.6%	6.2%	9.4%
$15,000 to $24,999	5.4%	6.0%	8.4%
$25,000 to $34,999	5.8%	6.2%	8.6%
$35,000 to $49,999	10.0%	10.3%	12.7%
$50,000 to $74,999	19.1%	19.2%	20.6%
$75,000 to $99,999	17.0%	16.3%	14.8%
$100,000 and above	38.2%	35.7%	25.6%
Median Income	**$82,568**	**$78,057**	**$62,571**

Notes:
1. Ames Research Center Area includes the combined jurisdictions of Mountain View and Sunnyvale.

Sources: Claritas, Inc.; Bay Area Economics, 2000.

B. Employment

This section presents employment data for the region, county and local area.

1. San Francisco Bay Area

According to ABAG, the Bay Area has approximately 3.7 million full and part time jobs. Although the early 1990s brought a softening of the region's economy, current Bay Area employment levels are well above pre-recession levels. Between 1990 and 2000, the number of jobs in the Bay Area increased

TABLE 3.14-5 **AGE DISTRIBUTION 1990 AND 2000**

	1990	2000 (est.)
AMES RESEARCH CENTER AREA[1]		
Under 18	18.8%	21.0%
18-24	10.4%	6.1%
25-34	25.9%	18.6%
35-44	16.1%	19.4%
45-54	10.3%	14.4%
55-64	8.2%	8.8%
65+	10.2%	11.7%
Median Age	33.0	37.2
SANTA CLARA COUNTY		
Under 18	24.2%	24.7%
18-24	11.6%	8.6%
25-34	21.1%	16.1%
35-44	16.2%	17.4%
45-54	10.8%	14.5%
55-64	7.5%	8.4%
65+	8.6%	10.2%
Median Age	**31.7**	**35.3**
SAN FRANCISCO BAY AREA		
Under 18	23.2%	23.9%
18-24	10.5%	8.0%
25-34	19.6%	14.8%
35-44	17.1%	18.0%
45-54	10.8%	14.8%
55-64	7.9%	8.8%
65+	11.0%	11.7%
Median Age	**33.4**	**36.9**

Notes:
1. Ames Research Center Area includes the combined jurisdictions of Mountain View and Sunnyvale.
Sources: Claritas, Inc.; Bay Area Economics, 2000.

by 15 percent. Much of this job growth was fueled by the rapid expansion of information technology, Internet, multimedia, e-commerce, and biotech industries, in addition to the traditionally-strong financial and real estate sectors. ABAG expects employment to grow at an annual rate of approximately 1.3 percent over the next 15 years. Table 3.14-6 contains employment data for the region and county.

The region's economy is mainly concentrated in services, wholesale and retail trade, and manufacturing. These four industry sectors make up 74 percent of the region's employment. ABAG forecasts a continuation of this trend through 2015.

The manufacturing sector composes 15 percent of the Bay Area's total employment. ABAG reports that technology jobs make up over 54 percent of this sector, reflecting the Bay Area's role as a global center for the development of information technology and other high-tech industries. The region benefits from a research and development infrastructure that boasts nine world-class research facilities and numerous other companies with major commitments to high-technology research and development. This concentration of public and private research and development institutions is a key factor in maintaining the Bay Area's technology leadership and innovation. The proximity of Bay Area research facilities to each other and to private industry attracts highly-skilled labor that typically migrates to research and administrative positions in federal or industry laboratories, enters private companies, or starts new technology-based firms.

Business services, banking, and the finance industry have grown in tandem with the technology sector. ABAG projects the number of business service jobs to grow faster than any other employment sector, at an annual rate of 1.7 percent from 2000 to 2015.

TABLE 3.14-6 **EMPLOYMENT PROJECTIONS BY INDUSTRY SECTOR**

	1990		2000		2015		2000 to 2015
Industry Sector	**Number**	**Percent**	**Number**	**Percent**	**Number**	**Percent**	**Annual Change**
SAN FRANCISCO BAY AREA							
Agriculture and Mining	36,980	1.2%	37,780	1.0%	37,480	0.8%	-0.1%
Construction	148,360	4.6%	185,800	5.0%	214,680	4.8%	1.0%
Manufacturing	516,920	16.1%	558,790	15.1%	656,760	14.7%	1.1%
High Technology	*273,790*	*8.5%*	*302,920*	*8.2%*	*338,890*	*7.6%*	*0.8%*
Transportation/Public Utilities	189,390	5.9%	223,570	6.1%	280,830	6.3%	1.5%
Wholesale Trade	192,000	6.0%	199,620	5.4%	253,280	5.7%	1.6%
Retail Trade	534,960	16.7%	579,960	15.7%	659,420	14.8%	0.9%
Finance, Insurance, Real Estate	228,310	7.1%	240,550	6.5%	270,670	6.1%	0.8%
Services	1,067,460	33.3%	1,390,860	37.7%	1,791,000	40.2%	1.7%
Business Services	*370,550*	*11.6%*	*541,050*	*14.7%*	*692,890*	*15.5%*	*1.7%*
Government	291,700	9.1%	271,660	7.4%	296,540	6.6%	0.6%
Total Employment	**3,206,080**		**3,688,590**		**4,460,660**		**1.3%**
SANTA CLARA COUNTY							
Agriculture and Mining	7,210	0.8%	7,430	0.7%	7,180	0.6%	-0.2%
Construction	31,060	3.5%	47,090	4.4%	51,590	4.1%	0.6%
Manufacturing	276,460	31.0%	286,260	26.6%	326,790	25.9%	0.9%
High Technology	*203,800*	*22.9%*	*217,710*	*20.2%*	*232,020*	*18.4%*	*0.4%*
Transportation/Public Utilities	23,680	2.7%	33,700	3.1%	42,420	3.4%	1.5%
Wholesale Trade	63,420	7.1%	62,410	5.8%	79,730	6.3%	1.6%
Retail Trade	129,700	14.6%	149,250	13.9%	163,950	13.0%	0.6%
Finance, Insurance, Real Estate	35,150	3.9%	39,240	3.6%	44,480	3.5%	0.8%
Service	270,230	30.3%	390,470	36.2%	479,250	38.0%	1.4%
Business Services	*109,580*	*12.3%*	*197,710*	*18.4%*	*222,230*	*17.6%*	*0.8%*
Government	54,020	6.1%	61,370	5.7%	64,470	5.1%	0.3%
Total Employment	**890,930**		**1,077,220**		**1,259,860**		**1.0%**

Sources: ABAG, *Projections 2000*; Bay Area Economics, 2001

2. Santa Clara County

The technology sector has a particularly strong influence on the Santa Clara County economy. ABAG reports that over 20 percent of the County's 1.0 million jobs are in the manufacturing of high technology. By 2015, however, high technology's share of jobs is expected to fall to 18 percent of total employment.

As with the Bay Area, manufacturing, service, wholesale, and retail trade sectors comprise the bulk of the County's employment, with 82.5 percent of all jobs. Employment data for Santa Clara County are shown in Table 3.14-6.

3. ARC Area

As shown in Table 3.14-7, the ARC area contains 209,030 jobs, almost 20 percent of all jobs in Santa Clara County. Almost 44 percent of ARC area jobs are in the Manufacturing & Wholesale Sector.

Even with the declining national economy and downturns in the technology sector, Sunnyvale and Mountain View's location in the heart of Silicon Valley grants these cities a prime position in the high-tech industry. Major technology firms in the ARC Area include Yahoo!, Network Appliances, Silicon Graphics, and Hewlett Packard.

C. Housing

This section describes existing housing conditions in the area most likely to be affected by proposed development at Ames Research Center.

1. Defining the Housing Impact Area

Bay Area housing markets do not conform uniformly to geographic and jurisdictional boundaries. Therefore, an analysis of housing market conditions and the housing impact of the NADP requires a distinct study area.

TABLE 3.14-7 **EMPLOYMENT PROJECTIONS BY INDUSTRY SECTOR - AMES RESEARCH CENTER AREA**

	2000		2010		2015		2000 to 2015
	Number	Percent	Number	Percent	Number	Percent	Annual Change
Ames Research Center Area[1]							
Manufacturing and Wholesale	91,130	43.6%	99,420	43.6%	101,530	43.3%	0.7%
Retail	23,280	11.1%	24,210	10.6%	24,650	10.5%	0.4%
Service	58,990	28.2%	65,820	28.8%	68,430	29.2%	1.0%
Other	35,630	17.0%	38,810	17.0%	39,950	17.0%	0.8%
Total	209,030		228,260		234,560		0.8%

Notes:
1. Ames Research Center Area includes the combined jurisdictions of Mountain View and Sunnyvale.

Sources: ABAG, *Projections 2000*; Bay Area Economics, 2001.

To define this area, data from the Metropolitan Transportation Commission's (MTC) *Commuter Forecasts for the San Francisco Bay Area 1990-2020* was analyzed. Since MTC organizes its data into "superdistricts" that do not correspond directly with jurisdictional boundaries, this analysis assumes that workers in Superdistrict 9 – the Sunnyvale/Mountain View Superdistrict – serve as a valid proxy for employees at Ames Research Center. The Housing Impact Area associated with the NADP was then drawn by examining the residential patterns of commuters to Superdistrict 9. Commuter forecasts for 2010 were used to conduct this analysis, as this is the closest year available to the NADP's projected build-out date of 2013. The complete MTC data set is contained in Table 3.14-8.

TABLE 3.14-8 **COMMUTERS TO SUNNYVALE/MOUNTAIN VIEW SUPERDISTRICT**

Super-district	District of Residence	District of Work	2000 Number	% of Total	2010 Number	% of Total
1	Downtown SF	Sunnyvale/Mountain View	548	0.1%	599	0.1%
2	Richmond District	Sunnyvale/Mountain View	1,153	0.3%	1,197	0.2%
3	Mission District	Sunnyvale/Mountain View	1,513	0.4%	1,593	0.4%
4	Sunset District	Sunnyvale/Mountain View	910	0.2%	942	0.3%
5	Daly City/San Bruno	Sunnyvale/Mountain View	2,306	0.6%	2,510	0.6%
6	**San Mateo/Burlingame**	**Sunnyvale/Mountain View**	**5,497**	**1.5%**	**6,095**	**1.5%**
7	**Redwood City/Menlo Park**	**Sunnyvale/Mountain View**	**9,838**	**2.6%**	**11,180**	**2.7%**
8	**Palo Alto/Los Altos**	**Sunnyvale/Mountain View**	**22,128**	**5.9%**	**24,526**	**5.8%**
9	**Sunnyvale/Mountain View**	**Sunnyvale/Mountain View**	**74,583**	**19.9%**	**87,497**	**20.8%**
10	**Saratoga/Cupertino**	**Sunnyvale/Mountain View**	**56,462**	**15.0%**	**61,248**	**14.5%**
11	**Central San Jose**	**Sunnyvale/Mountain View**	**38,805**	**10.3%**	**43,348**	**10.3%**
12	**Milpitas/East San Jose**	**Sunnyvale/Mountain View**	**61,051**	**16.3%**	**67,192**	**16.0%**
13	**South San Jose/Almaden**	**Sunnyvale/Mountain View**	**29,403**	**7.8%**	**31,735**	**7.5%**
14	**Gilroy/Morgan Hill**	**Sunnyvale/Mountain View**	**5,568**	**1.5%**	**5,386**	**1.3%**
15	**Livermore/Pleasanton**	**Sunnyvale/Mountain View**	**5,950**	**1.6%**	**7,128**	**1.7%**
16	**Fremont/Union City**	**Sunnyvale/Mountain View**	**23,652**	**6.3%**	**25,349**	**6.0%**
17	Hayward/San Leandro	Sunnyvale/Mountain View	3,992	1.1%	4,204	1.0%
18	Oakland/Alameda	Sunnyvale/Mountain View	1,558	0.4%	1,626	0.4%
19	Berkeley/Albany	Sunnyvale/Mountain View	467	0.1%	483	0.1%
20	Richmond/El Cerrito	Sunnyvale/Mountain View	522	0.1%	553	0.1%
21	Concord/Martinez	Sunnyvale/Mountain View	731	0.2%	825	0.2%
22	Walnut Creek/Lamorinda	Sunnyvale/Mountain View	592	0.2%	660	0.2%
23	Danville/San Ramon	Sunnyvale/Mountain View	2,487	0.7%	2,997	0.7%
24	Antioch/Pittsburg	Sunnyvale/Mountain View	1,135	0.3%	1,419	0.3%
25	Vallejo/Benicia	Sunnyvale/Mountain View	386	0.1%	408	0.1%
26	Fairfield/Vacaville	Sunnyvale/Mountain View	534	0.1%	614	0.1%

Super-district	District of Residence	District of Work	2000 Number	% of Total	2010 Number	% of Total
27	Napa	Sunnyvale/Mountain View	61	0.0%	54	0.0%
28	St. Helena/Calistoga	Sunnyvale/Mountain View	65	0.0%	63	0.0%
29	Petaluma/Sonoma	Sunnyvale/Mountain View	59	0.0%	56	0.0%
30	Santa Rosa/Sebastopol	Sunnyvale/Mountain View	99	0.0%	84	0.0%
31	Healdsburg/Cloverdale	Sunnyvale/Mountain View	77	0.0%	72	0.0%
32	Novato	Sunnyvale/Mountain View	136	0.0%	140	0.0%
33	San Rafael	Sunnyvale/Mountain View	190	0.1%	198	0.0%
34	Mill Valley/Sausalito	Sunnyvale/Mountain View	107	0.0%	115	0.0%
	Santa Cruz County	Sunnyvale/Mountain View	6,514	1.7%	8,192	1.9%
	San Joaquin County	Sunnyvale/Mountain View	4,672	1.2%	6,027	1.4%
	Stanislaus County	Sunnyvale/Mountain View	5,389	1.4%	6,713	1.6%
	Sacramento County	Sunnyvale/Mountain View	3,216	0.9%	4,033	1.0%
	Monterey County	Sunnyvale/Mountain View	647	0.2%	940	0.2%
	San Benito County	Sunnyvale/Mountain View	894	0.2%	1,152	0.3%
	Placer County	Sunnyvale/Mountain View	639	0.2%	859	0.2%
	Merced County	Sunnyvale/Mountain View	603	0.2%	711	0.1%
	Yolo County	Sunnyvale/Mountain View	160	0.0%	176	0.0%
	Lake County	Sunnyvale/Mountain View	56	0.0%	62	0.0%
	Mendocino County	Sunnyvale/Mountain View	0	0.0%	0	0.0%
	Colusa County	Sunnyvale/Mountain View	0	0.0%	0	0.0%
		Total	**375,355**	**100%**	**420,961**	**100%**

Note: Bolded superdistricts are within Housing Impact Area.

Source: Metropolitan Transportation Commission, *Commuter Forecasts for the San Francisco Bay Area 1990-2020*; Bay Area Economics, 2001.

The MTC data showed a sizeable commute-shed, with workers traveling from Marin, Yolo, and even Sacramento County to reach Superdistrict 9. Other reports have also illustrated people's willingness to drive great distances to Silicon Valley jobs. The San Joaquin Council of Governments' Altamont Pass 2000 Commuter Survey shows that 21 percent of drivers commuting through the Altamont Pass, the gateway to the Tri-Valley, were destined for Santa Clara County. These trends suggest that an extremely broad Housing Impact Area could be drawn around Ames Research Center.

However, an overly-broad Housing Impact Area spreads the impact across a large market, possibly masking effects on local communities. To avoid this result, this analysis takes a more conservative approach, and examines the housing impact on a smaller area than the full commute-shed. The methodology assumes that NRP workers will search areas near their workplace for affordable housing before going further afield. MTC data validates this assumption, showing that the vast majority of commuters to Superdistrict 9 in 2010 will reside in the immediate Santa Clara County.

As such, only superdistricts that generated over one percent or more of the total commuters to Superdistrict 9 were included in the Housing Impact Area. Three counties outside the Bay Area – Santa Cruz, Stanislaus, and San Joaquin Counties - fell above the one percent cutoff line. These counties are excluded from the Housing Impact Area because commuters from these areas come from an entire county which is larger than a single superdistrict. The greater than one percent standard, therefore, does not apply. Further, as stated above, a smaller Housing Impact Area is a more conservative approach to determining housing impact. Table 3.14-9 contains the superdistricts included in the Housing Impact Area and lists the number of commuters from each superdistrict. Together, these superdistricts generate over 88 percent of commuters to Superdistrict 9.

TABLE 3.14-9 **DEFINITION OF THE HOUSING IMPACT AREA**

District of Residence	District of Work	Number[a]	Percent of All Commuters to Sunnyvale/ Mountain View Superdistrict
Sunnyvale/Mountain View	Sunnyvale/Mountain View	87,497	20.8%
Milpitas/East San Jose	Sunnyvale/Mountain View	67,192	16.0%
Saratoga/Cupertino	Sunnyvale/Mountain View	61,248	14.5%
Central San Jose	Sunnyvale/Mountain View	43,348	10.3%
South San Jose/Almaden	Sunnyvale/Mountain View	31,735	7.5%
Palo Alto/Los Altos	Sunnyvale/Mountain View	24,526	5.8%
Fremont/Union City	Sunnyvale/Mountain View	25,349	6.0%
Redwood City/Menlo Park	Sunnyvale/Mountain View	11,180	2.7%
Livermore/Pleasanton	Sunnyvale/Mountain View	7,128	1.7%
San Mateo/Burlingame	Sunnyvale/Mountain View	6,095	1.4%
Gilroy/Morgan Hill	Sunnyvale/Mountain View	5,386	1.3%
TOTAL		**370,684**	**88.1%**
All Commuters to Sunnyvale/ Mountain View Superdistrict		420,961	

[a] Forecasts for 2010 were used, as this is the closest date available to NRP's anticipated buildout year of 2013.

Sources: Metropolitan Transportation Commission, *Commuter Forecasts for the San Francisco Bay Area 1990-2020;* Bay Area Economics, 2001.

2. Housing Impact Area Population Characteristics

Rather than describing changes over the last decade, this section concentrates on population and household trends in the Housing Impact Area between 2000 and 2015. This time series corresponds with the NADP's anticipated build out year of 2013.

The Housing Impact Area's population characteristics are summarized in Table 3.14-10. According to ABAG, the Housing Impact Area had 2.7 million persons in 2000, and will increase by an average annual rate of 0.8 percent to 3.0 million by 2015. The number of households will grow from 884,543 to about 1 million between 2000 and 2015 at an average annual rate of 0.9 percent. The average household size will decrease from 2.98 to 2.96, while the mean household income will rise from $73,115 to $86,322 (in constant 1989 dollars as calculated by MTC).

3. Housing Market in the Housing Impact Area

This section analyzes the current housing market conditions in the Housing Impact Area. It examines the housing stock, rental and ownership markets, and affordability. Although the housing market is likely to shift dramatically between 2000 and the NADP build-out date, this data helps to establish the baseline conditions for analysis.

The Bay Area housing market is one of the most competitive in the country. Rapid population and employment growth, described above, is largely responsible for a lack of housing supply and great demand. ABAG estimates the potential for 308,800 units between 2000 and 2015, based on available land supply and current local land use policies, and 315,380 new households over the same period. These projections result in a net housing shortage of 6,580 units by 2015. Additionally, the Metropolitan Transportation Commission estimates that the region will also have 203,444 in-commuters from outside the region by 2010. Assuming 1.5 employed residents per household, this suggests a regional housing shortage of over 130,000 units by 2010, with an even greater housing shortfall by 2015.

TABLE 3.14-10 **HOUSING IMPACT AREA CHARACTERISTICS**

Housing Impact Area[1]	2000	2015	Total Change 2000 to 2015	Annual Change 2000 to 2015
Population	2,694,261	3,048,158	354,257	0.8%
Households	884,543	1,009,775	125,232	0.9%
Average Household Size	2.98	2.96	-0.02	0.0%
Average Workers Per Household	1.61	1.68	0	0.3%
Mean Household Income[2]	$73,115	$86,322	$13,207	1.1%

Notes:
[1] Housing Impact Area includes the MTC Superdistricts listed in Table 3.14-9.
[2] In constant 1989 dollars.

Sources: MTC, *Superdistrict and County Summaries of ABAG Projections 2000, 1990-2020*; Bay Area Economics, 2001.

The Housing Impact Area, as a subset of the Bay Area, suffers from similar conditions. The housing market in the Housing Impact Area is discussed in detail in the following section.

a. Housing Stock

As shown in Table 3.14-11, ABAG estimates the total number of occupied units in the Housing Impact Area to be 884,543. Approximately 591,659, or 66.9 percent, of these are single-family dwellings, and 292,884 – 33.1 percent – are multifamily dwellings. The total number of occupied units is expected to increase by nearly 13.8 percent to 1 million by 2015, but the breakdown between single- and multifamily units will remain relatively constant.

TABLE 3.14-11 **HOUSING STOCK IN HOUSING IMPACT AREA**

	2000		2015			
Superdistrict	**Number of Units[1]**	**Percent of Total**	**Number of Units[1]**	**Percent of Total**	**Percent Change 2000 to 2015**	**Change as Percent of Total New Units in HIA**
Sunnyvale/Mountain View	87,830	9.9%	103,887	10.3%	18.3%	12.9%
Milpitas/East San Jose	97,187	11.0%	111,580	11.1%	14.8%	11.6%
Saratoga/Cupertino	117,194	13.2%	126,525	12.5%	8.0%	7.5%
Central San Jose	97,646	11.0%	113,849	11.3%	16.6%	13.0%
South San Jose/Almaden	68,725	7.8%	76,134	7.5%	10.8%	5.9%
Palo Alto/Los Altos	69,446	7.9%	75,777	7.5%	9.1%	5.1%
Fremont/Union City	98,859	11.2%	109,304	10.8%	10.6%	8.4%
Redwood City/Menlo Park	77,383	8.7%	82,447	8.2%	6.5%	4.1%
Livermore/Pleasanton	61,653	7.0%	85,111	8.4%	38.0%	18.8%
San Mateo/Burlingame	79,568	9.0%	86,079	8.5%	8.2%	5.2%
Gilroy/Morgan Hill	29,052	3.3%	36,382	3.8%	25.2%	7.5%
Multi-Family Dwellings	292,884	33.1%	336,483	33.3%	14.9%	35.0%
Single-Family Dwellings	591,659	66.9%	673,292	66.7%	13.8%	65.6%
Total	884,543		1,009,075		14.1%	

Notes:
1. Only includes occupied units.

Sources: MTC, *Superdistrict and County Summaries of ABAG's Projections 2000, 1990-2020*; Bay Area Economics, 2001.

Four superdistricts – Livermore/Pleasanton, Sunnyvale/Mountain View, Central San Jose, and Milpitas/East San Jose – are expected to absorb approximately 56 percent of new households in the Housing Impact Area between 2000 and 2015. The Livermore/Pleasanton Superdistrict alone will gain over 23,000 occupied units, which represents almost 19 percent of all occupied units constructed in the Housing Impact Area during this period. The Sunnyvale/Mountain View Superdistrict will see the second largest growth spurt, gaining over 16,000 occupied units, or 12.9 percent of all occupied units constructed in the Housing Impact Area.

While data on jobs-housing imbalance in the HIA is not available, ABAG anticipates that Santa Clara County alone faces a 35,180 unit shortage between 2000 and 2015.

b. Rental Housing Market

Table 3.14-12 presents rental housing cost data for the Housing Impact Area. According to a Real Facts survey of multi-family complexes with at least 50 units, the average rent in the Housing Impact Area was $1,763 a month and the average vacancy rate was 3.9 percent, as of March 2001. The Housing Impact Area's highly competitive rental housing market has loosened up over the last year. Between 2000 and the second quarter of 2001, although the average rent rose approximately 11.0 percent, the vacancy rate rose 2.4 percent.

Table 3.14-13 contains data on rental affordability in the Housing Impact Area. Affordable rents are calculated for households at the 25th percentile, the median, and the 75th percentile of Santa Clara County incomes in 2000. Households at the 25th percentile of household income can afford a monthly rent of $1,122; households at the median household income can afford a monthly rent of $1,951; and households at the 75th percentile of household income can afford a monthly rent of $3,122. All affordable rents include utilities, and represent 30 percent of the household income. Tables 3.14-11 and 3.14-12 show the monthly rent ranges of various unit types in the Housing Impact Area. These can be compared to the affordable rents for each income level to determine what unit types are available to different household incomes.

TABLE 3.14-12 **OVERVIEW OF THE HOUSING IMPACT AREA RENTAL HOUSING MARKET**

CURRENT MARKET DATA

Unit Type	Number	Percent of Mix	Average Square Feet	Average Rent	Average Rent/ Square Feet
Studio	6,672	6.3%	468	$1,356	$2.90
1 BR/1 BA	47,762	45.2%	698	$1,594	$2.28
2 BR Townhouse	2,740	2.6%	1,071	$1,983	$1.85
2 BR/1 BA	15,209	14.4%	878	$1,694	$1.93
2 BR/2 BA	29,171	27.6%	1,011	$2,062	$2.04
3 BR Townhouse	494	0.5%	1,237	$2,367	$1.91
3 BR/2 BA	3,701	3.5%	1,217	$2,364	$1.94
Totals	105,750	100.0%	826	$1,763	$2.13

AVERAGE RENT HISTORY

Unit Type	1998	1999	1998-1999 Change	2000	1999-2000 Change	2001[1]	2000-2001 Change
Studio	$897	$935	4.2%	$1,225	31.0%	$1,382	12.8%
1 BR/1 BA	$1,136	$1,187	4.5%	$1,536	29.4%	$1,650	7.4%
2 BR Townhouse	$1,402	$1,483	5.8%	$1,891	27.5%	$2,048	8.3%
2 BR/1 BA	$1,217	$1,278	5.0%	$1592	24.6%	$1,732	8.8%
2 BR/2 BA	$1,513	$1,574	4.0%	$2,031	29.0%	$2,139	5.3%
3 BR Townhouse	$1,632	$1,716	5.1%	$2,102	22.5%	$2,446	16.4%
3 BR/2 BA	$1,726	$1,773	2.7%	$2,195	23.8%	$2,396	9.2%
Totals	$1,263	$1,321	4.8%	$1,639	24.1%	$1,820	11.0%

OCCUPANCY RATE

Year	Average Occupancy
1998	95.1%
1999	96.5%
2000	98.5%
2000[2]	96.1%

AGE OF HOUSING INVENTORY

Year	Percent of Inventory
Pre 1960s	3%
1960s	33%
1970s	36%
1980s	19%
1990s	9%

Notes:
1. Average of first two quarters of 2000.

Sources: Real Facts, Inc.; Bay Area Economics, 2001.

TABLE 3.14-13 **RENTAL HOUSING AFFORDABILITY ANALYSIS**

INCOME AND AFFORDABILITY

Income Level	Estimated Household Income[1]	Monthly Affordable Rent[2]
25th Percentile	$44,864	$1,122
Median	$78,057	$1,951
75th Percentile	$124,877	$3,122

RENTS[3]

Unit Type	Average Low Rent	Average High Rent	Average Rent
Studio	$1,330	$1,408	$1,382
1BR/1 BA	$1,560	$1,663	$1,650
2 BR Townhouse	$1,955	$2,039	$2,048
2 BR/1 BA	$1,674	$1,732	$1,732
2 BR/2 BA	$2,005	$2,176	$2,139
3 BR Townhouse	$2,340	$2,421	$2,446
3 BR/2 BA	$2,325	$2,443	$2,396
Totals	$1,725	$1,839	$1,820

Notes:
1. From Table 3.14-4: Estimated 2000 Household Income Distribution.
2. Affordable rent is considered to be 30% of household income, including utilities.
3. From Real Facts survey of apartment complexes with 50 or more units in Housing Impact Area. Rents as of June 2001.

Sources: Real Facts, Inc.; Bay Area Economics, 2001.

c. Ownership Housing Market

Table 3.14-14 contains data on all full, verified, and confirmed sales in the Housing Impact Area between August 17, 2001 and August 31, 2001. Using these sales as a sample, it is apparent that the Housing Impact Area contains some of the highest home prices in the region. The median single-family home in the Housing Impact Area is $491,250. The median sale price of a condominium in the Housing Impact Area during the same period is $338,500.

Table 3.14-15 presents an affordability analysis for ownership housing in the Housing Impact Area, using Santa Clara County's 2000 household income distribution as a basis for determining affordability. Households at the 25th percentile of household income can afford less than one percent of the single-family homes sold during the last two weeks of August 2001 in the Housing Impact Area. Households with the median household income can afford only two percent of the single-family homes sold during the same period, and households at the 75th percentile can afford only 41.8 percent of homes sold.

Condominiums are somewhat more affordable. Although households at the 25th percentile of household income can afford 1.3 percent of condominiums sold within the Housing Impact Area. Households at median and 75th percentile of household incomes can afford 25.0 percent and 82.5 percent of condominiums respectively.

D. Fiscal Environment

This section discusses the existing fiscal conditions in Santa Clara County, Sunnyvale, Mountain View, and the School Districts that take students from Moffett Field.

1. Ames Research Center

For fiscal purposes, Ames Research Center is a complex environment. This is partly due to the numerous legal jurisdictions overlaid on the site. The city

TABLE 3.14-14 **OVERVIEW OF HOUSING IMPACT AREA FOR-SALE HOUSING MARKET**

SINGLE-FAMILY			CONDOMINIUMS		
Sale Price	**Number of Units**	**Percent of Total**	**Sale Price**	**Number of Units**	**Percent of Total**
Less than $200,000	4	0.7%	Less than $150,000	4	2.5%
$200,000 to $249,999	2	1.0%	$150,000 to $199,999	5	3.1%
$250,000 to $299,999	7	2.2%	$200,000 to $249,999	18	11.3%
$300,000 to $349,999	32	8.8%	$250,000 to $299,999	29	18.1%
$350,000 to $399,999	74	16.5%	$300,000 to $349,999	28	17.5%
$400,000 to $449,999	100	13.8%	$350,000 to $399,999	24	15.0%
$450,000 to $499,999	61	11.1%	$400,000 to $449,999	19	11.9%
$500,000 to $549,999	54	7.3%	$450,000 to $499,999	14	8.8%
$550,000 to $599,999	47	7.0%	$500,000 to $549,999	6	3.8%
$600,000 to $649,999	27	6.4%	$550,000 to $599,999	4	2.5%
$650,00 to $699,999	22	3.7%	$600,000 to $649,999	4	2.5%
$700,000 to $749,999	17	4.2%	$650,000 to $699,999	1	0.6%
$750,000 to $799,999	26	2.4%	$700,000 and above	4	2.5%
$800,000 to $849,999	14	2.7%	**Total**[1]	160	
$850,000 to $899,999	7	1.5%			
$900,000 to $949,999	6	1.9%	**Median Sale Price**	$338,500	
$950,000 to $999,999	8	1.2%	**Average Sale Price**	$358,216	
$1,000,000 to $1,499,999	22	4.0%			
$1,500,000 to $1,999,999	8	1.6%			
$2,000,000 and above	8	0.7%			
Total[1]	**546**	**100.0%**			
Median Sale Price	$491,250				
Average Sale Price	$598,951				

Notes:

1. Represents all full, verified, and confirmed sales within the Housing Impact Area between August 17, 2001 and August 31, 2001.

Sources: First American Real Estate Services; Bay Area Economics, 2001.

TABLE 3.14-15 **FOR-SALE HOUSING AFFORDABILITY ANALYSIS**

		Single-Family Residence			Condominium		
Income Level	Estimated Household Income[1]	Affordable Sale Price[2]	Number of Affordable Units[3]	Percent of All Sales	Affordable Sale Price[4]	Number of Affordable Units[5]	Percent of All Sales
25th Percentile	$44,864	$163,401	1	0.2%	$139,700	2	1.3%
Median	$78,057	$284,295	11	2.0%	$272,704	40	25.0%
75th Percentile	$124,877	$454,821	228	41.8%	$460,313	132	82.5%

Notes:
1. From Table 3.14-4: Estimated 2000 Household Income Distribution
2. Assumes 70% annual fixed interest, 30-year term, 20% of sales price down payment, 1.1% property tax, 0.75% of sales price annual insurance, 30% of household income available for principal, interest, taxes, insurance.
3. Of all full, verified and confirmed single-family home sales in Housing Impact Area from 10/31/2000 to 11/15/2000. Table 3.14-13 contains sales data.
4. Assumes 7.0% annual fixed interest, 30-year term, 20% of sale price down payment, 1.1% property tax, $250/month homeowners dues, 30% of household income available for principal, interest, taxes, insurance.
5. Of all full, verified and confirmed condominium sales in Housing Impact Area from 8/17/01 to 8/31/01.

Source: Claritas, Inc.; First American Real Estate Services; Bay Area Economics, 2001.

limits of Sunnyvale and Mountain View, the Sunnyvale and Mountain View spheres of influence and two school districts all overlay Ames Research Center.

The majority of Ames Research Center lies within unincorporated Santa Clara County. However, portions of it, specifically parcels 116-07-010 and 116-12-008, fall within the City of Mountain View's limits. Parcel 015-36-009, the northern tip of Ames Research Center, is within the City of Sunnyvale. These boundaries and their jurisdictional status affect which jurisdiction may assess various taxes on the different portions of the site.

With respect to jurisdictional status, over one-half of Moffett Field, including most areas slated for development under the NADP and the entire NRP, is under exclusive federal legislative jurisdiction. Such areas are sometimes known as "federal enclaves." Exclusive federal legislation means that the federal government alone has legislative jurisdiction and provides law enforcement and public safety services.

Almost all of the Bay View area is on lands in which the federal government has a proprietary interest, meaning that although the federal government owns the land it has no legislative jurisdiction. Typically, this status implies that a city or county would provide law enforcement and public safety services to these areas. However, in the case of Moffett Field, the Federal Government has historically provided those services in these areas, and anticipates continuing to do so in the future.

In areas under exclusive federal legislative jurisdiction, personal and real property are not subject to property, or *ad valorem* ("according to the value"), taxes regardless of whether the property is owned by the Federal Government or a non-Federal entity. As such, neither the Federal Government nor non-Federal entities operating under exclusive federal legislative jurisdiction are subject to possessory interest property tax. At Ames Research Center, non-Federal entities, including private corporations and non-profit private and state educational entities, will lease Federal land and construct buildings and other fixtures on site, and so will not be subject to real or personal property taxes.

However, Congress has waived the sovereign immunity of the Federal Government on exclusive jurisdiction land for other taxes. Under the "Buck Act," 4 USC 105-110, state and local sales and use taxes are applicable within exclusive federal legislative jurisdiction areas. The same is true for income taxes. Of course, such taxes may not be levied on the Federal government itself or any Federal instrumentality, but private for-profit corporations in exclusive federal legislative jurisdiction, as well as not-for-profit entities, are subject to these taxes.

Areas under partial legislative jurisdiction or proprietary interest are subject to state and local taxes. Therefore, non-Federal entities in these areas are subject to all taxes, including property tax, unless the entities have another status (e.g., not-for-profit or State entities) that would otherwise exempt them.

2. Santa Clara County

According to the Fiscal Year 2001 Recommended Budget, Santa Clara County anticipates $462.7 million in General Fund Unallocated Revenues for Fiscal Year 2000. Motor vehicle in-lieu fees and secured property taxes represent the two largest unallocated revenue sources, with $133.0 million and $180.0 million in respective revenues for Fiscal Year 2000.

The Fiscal Year 2001 Recommended Budget reports that County revenue has grown in conjunction with Silicon Valley's economic expansion. Three of the County General Fund's largest revenue sources – secured property tax, Motor Vehicle In-Lieu fees, and public safety sales tax – are all projected to increase between Fiscal Years 2000 and 2001. The County estimates a $6 million surplus as a result. However, expenditures have also risen in tandem with the economy. The Fiscal Year 2001 Recommended Budget reports that lease, salary, and employee benefits costs have grown dramatically, forcing the County to maintain a cautious approach to resource allocation.

3. The City of Sunnyvale

The City of Sunnyvale's Fiscal Year 2000/2001 Budget projects a total revenue of $203.2 million, and a General Fund revenue of $94.2 million. The two

largest sources of revenue are Sales Tax, which comprises 14.2 percent of total revenue, and Property Tax, which is 10.5 percent of total revenue. Transient Occupancy Tax, Utility Tax, Gas Tax, and Other Taxes encompass 8.5 percent of the total revenue. State Shared Revenues, largely Motor Vehicle In-Lieu Fees, comprise another 5.3 percent of total revenue. Expenditures for 2000 to 2001 total $197.6 million, with a total operating budget of $157.9 million.

Like the County, the City of Sunnyvale has benefited from Silicon Valley's economic growth, with sales tax and property tax increases reflecting the area's prosperity. The 2000/2001 Budget states that other major revenue sources have also continued to grow, significantly exceeding earlier expectations. According to the Fiscal Year 2000/2001 Budget, the City's short-term financial outlook remains solid, although shifts in the regional and state economy, as well as legislative changes, may impact the City's financial well-being.

4. The City of Mountain View

The City of Mountain View's 2000/2001 Proposed Budget projects $150 million in total revenue, and $67.3 million in General Fund revenues for Fiscal Year 2000/2001. The two largest revenue sources, Sales Tax and Property Tax comprise 13.1 percent and 6.9 percent respectively of the City's total revenue. Other local taxes, including the Transient Occupancy Tax, Business License Tax, and Utility User's Tax make up another 4.7 percent of total revenue. Intergovernmental revenue, primarily Motor Vehicle License Fees, comprises 3.1 percent of total revenue. The City estimates $157.7 million in total expenditures over the same time period, $65.7 million of which goes towards General Operations.

While the City's utility funds and various special funds are in healthy financial condition, the 2000/2001 Proposed Budget reports the General Fund is relatively unstable. The City was fortunate in the mid-1990s as General Fund revenues experienced steady and significant growth. However, over the last three years General Fund revenues have failed to keep pace with growth in General Fund expenditures. According to the 2000/2001 Proposed Budget, decreasing Sales Tax revenue is primarily responsible for this situation. The

City's Economic Stabilization Contingency fund has helped avoid service cutbacks, but the fund has been reduced to the point that it cannot counter any more significant revenue reductions. This trend will present a major challenge to the City, as the General Fund supports most City services and the majority of the City's Capital Improvement Program.

5. Mountain View-Whisman School District

The Mountain View-Whisman School District serves elementary and middle school students from Moffett Field. This section describes the fiscal condition of the District.

The Mountain View-Whisman School District's 2001-2001 Budget projects $30.6 million in revenue and $30.4 million in expenditures for its General Fund. The excess funds from this fiscal year, combined with additional sources, provides the District an ending balance of $2.1 million.

A variety of federal, State, and local sources comprise the District's General Fund. The revenue limit represents the primary source of funding, comprising $20.6 million, or 67 percent of the General Fund. A school district's revenue limit is set annually by the State Department of Education, and is the amount of revenue that a district can collect annually for general purposes from local property taxes and state aid. The revenue limit is based on a district's average daily attendance (ADA), which is the number of students present on each school day throughout the year, divided by the total number of school days in the school year.

The District's General Fund also receives $1.2 million in federal income. School officials report that they estimate receiving $50,000 in Federal Impact Aid during this fiscal year.

In addition, the District receives $5.1 million in State income. A variety of sources ranging from Class Size Reduction funds to Lottery dollars comprise this category, and collectively make up 17 percent of the General Fund revenue.

Local income sources, the largest being lease revenue and Special Education Local Plan Area (SELPA) transfers, comprise the final $3.7 million, or 12 percent, of the General Fund.

6. Mountain View-Los Altos Union High School District

The Mountain View-Los Altos Union High School District Fiscal Year 2002 Budget projects $29.4 million in revenue and $28.8 million in expenditures for its General Fund. After interfund transfers, this results in a net general fund balance of $423,715.

The District's revenue limit of $24.8 million makes up over 84 percent of the total General Fund income. The District is a State Basic Aid District, indicating that the District's property tax revenue exceeds the State-set revenue limit. As a result, the State will only pay a Basic Aid amount ($120 per ADA or $24,000 per district, whichever is greater) for increased ADAs.

Federal sources contribute $454,102 to the General Fund. In the 2000-2001 school year, the District did not receive any Federal Impact Aid, and school officials report that they are unlikely to apply for aid in the foreseeable future due to the time-consuming application process and limited aid amount.

E. Environmental Justice

Environmental Justice is the principle that low-income and minority populations should not disproportionately bear the burden of environmental hazards. On February 11, 1994, the President of the United States issued an Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (Executive Order 12898). The order is designed to focus Federal attention on the environmental and human health conditions in minority and low-income communities with the goal of achieving environmental justice.

NASA has developed an Environmental Justice Strategy that implements the Executive Order by integrating environmental justice into all of its programs and activities. Each NASA center (including Ames Research Center) developed its own Environmental Justice Implementation Plan and adapted its NEPA process to ensure that environmental justice concerns are addressed in each Environmental Assessment and EIS, as appropriate. According to the Executive Order No. 12898, evaluation of potential environmental justice impacts should be based on socioeconomic information to the extent possible, identifying minority populations and/or low-income populations that may be adversely affected by NASA's activities.

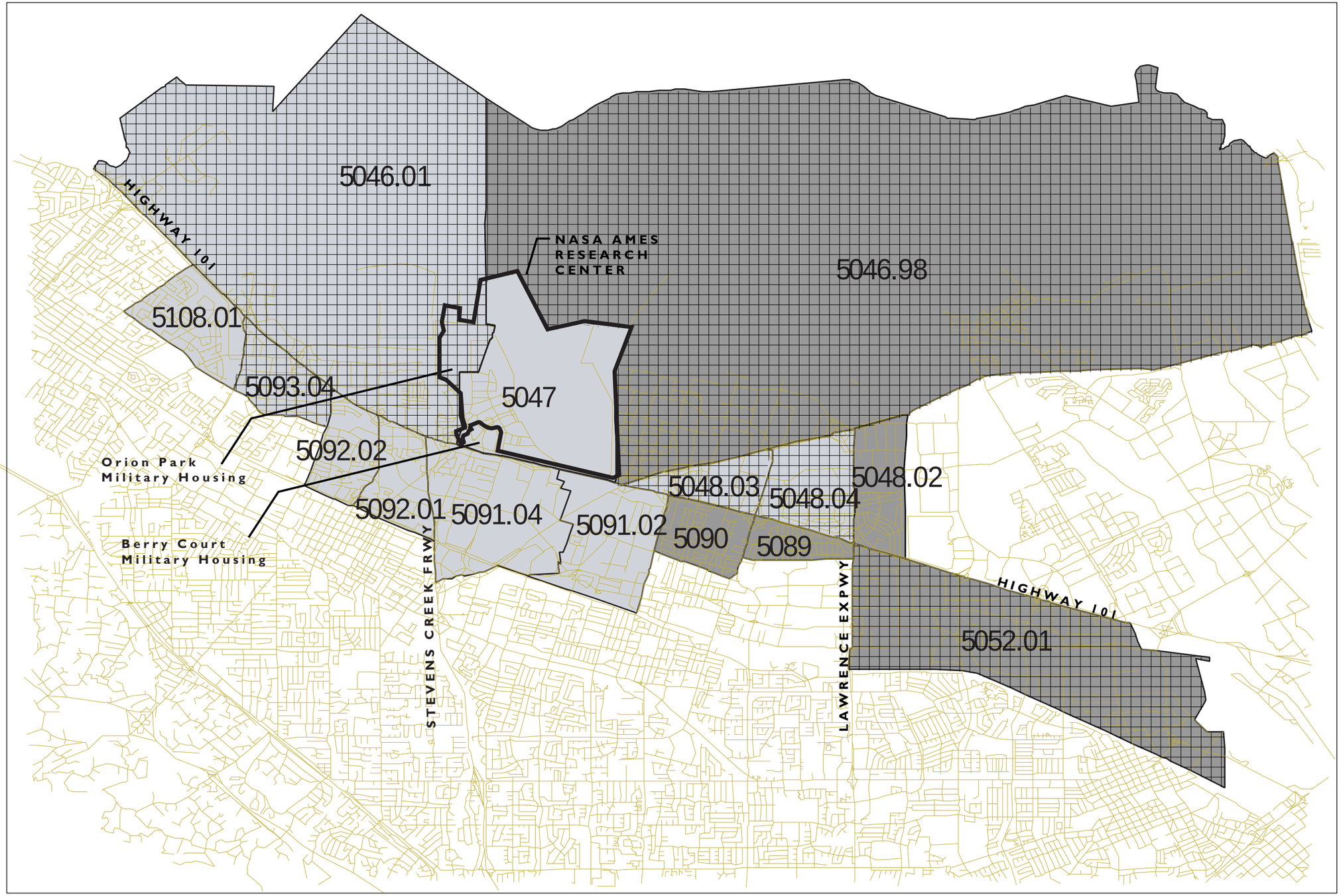
Concerns have been raised that impacts from traffic and construction generated by implementation of the proposed NADP project could disproportionately affect low-income and minority populations. Information about minority and low- income populations was gathered for the 15 census tracts located along Highway 101 within 5 kilometers (3 miles) of Ames Research Center. These tracts include single- and multi-family housing and mobile home parks within the cities of Mountain View and Sunnyvale, as well as the Berry Court and Orion Park Military Housing areas, which are outside Ames Research Center boundaries but still within Moffett Field. Figure 3.14-1 shows the location of these census tracts.

1. Minority Populations

Table 3.14-16 provides a summary of racial information based on the 1990 Census for the census tracts surrounding Ames Research Center. Persons who identified themselves as white constituted the largest group in these census tracts (57.2 percent), followed by Asian (19.4 percent), Hispanic (10.2 percent), other (7.9 percent), and black (4.7 percent). A similar breakdown was found

FIGURE 3.14-1

1990 CENSUS TRACTS ANALYZED FOR ENVIRONMENTAL JUSTICE



Minority Populations:

5046.98
5048.02
5052.01
5089
5090

Low Income Populations:

5046.01
5046.98
5048.03
5048.04
5052.01
5093.04

N

0 274m 549m 1097m

0 900ft 1800ft 3600ft

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

TABLE 3.14-16 **RACIAL DISTRIBUTION IN THE ENVIRONMENTAL JUSTICE STUDY AREA (1990 CENSUS)**

	White	Hispanic	Black	American Indian, Eskimo, Aleut	Asian or Pacific Islander	Other	Combined Minority
5046.01	65.1	7.3	12.3	0.9	11.7	2.7	34.9
5046.98	22.8	52.1	0	0	2.9	22.2	77.2
5047	79.5	3.3	9.4	0	5.1	2.6	20.5
5048.02	47.6	8.8	2.6	0.3	33.2	7.4	52.4
5048.03	56.1	8.0	6.1	0.9	16.4	12.5	43.9
5048.04	68.1	5.2	2.2	0.1	18.1	6.3	31.9
5052.01	28.4	51.5	0	0.8	19.3	0	71.6
5089	37.9	9.0	3.3	1.2	36.8	11.8	62.1
5090	49.5	12.4	3.8	0.2	20.3	13.8	50.5
5091.02	65.5	6.8	5.5	0	19.4	2.8	34.5
5091.04	57.2	8.1	8.5	1.0	17.1	8.1	42.8
5092.01	67.9	4.8	3.2	0.3	18.9	4.9	32.9
5092.02	55.8	14.4	4.9	0.8	20.0	4.1	44.2
5093.04	58.8	7.4	6.9	1.6	13.1	12.3	41.2
5108.01	78.9	1.9	2.4	0	15.4	1.4	21.1
Moffett Area	57.2	10.2	4.7	0.5	19.4	7.9	42.8
Santa Clara County	58.4	10.8	3.7	0.6	17.5	9.1	41.6

in Santa Clara County as a whole, which is 58.4 percent white, 17.5 percent Asian, 10.8 percent Hispanic, 9.1 percent other, and 3.7 percent black. The combined minority populations in the tracts surrounding Ames Research Center is 42.8 percent. The combined minority population for Santa Clara County as a whole is 41.6 percent.

As defined by the Department of Housing and Urban Development (HUD), a minority community is one that is more than 40 percent minority populations. Based on this definition, nine of the census tracts surrounding Ames Research Center would be considered minority communities, as well as Santa Clara County itself. Of the census tracts that meet the HUD definition of minority communities, only five have a minority population substantially higher than the County average – tract 5046.98 (77.2 percent), 5048.02 (52.4 percent), 5052.01 (71.6 percent), 5089 (62.1 percent), 5090 (50.5 percent) – while four - tract 5047 (20.5 percent), tract 5048.04 (31.9), tract 5092.01 (32.9 percent), and tract 5108.01 (21.1 percent) have a minority population substantially smaller than the County average. An analysis of 2000 census race data found that the same number of census tracts surrounding the ARC would be considered minority communities. Four of the 2000 tracts have a minority population substantially higher than the County average.

2. Low-Income Populations

As defined by the Department of Housing and Urban Development (HUD), low income households are those households with incomes that earn 51 to 80 percent of the mean household income, and very low income households are those households with incomes under 50 percent of the mean household income. The overall mean household income in the City of Mountain view, based on 1990 census data (in 1990 dollars), is $51,970. The overall mean household income in the City of Sunnyvale, based on 1990 census data (in 1990 dollars), is $55,570. Based on this mean income data, it is assumed that the incomes for low income households are between $25,000 and $39,999 and that the incomes for very low income households are below $25,000. No data regarding income is available from the 2000 census at this time.

Table 3.14-17 provides a summary of income for the census tracts surrounding Ames Research Center, based on 1990 Census data. Collectively, incomes of households in the census tracts near the Center are consistent with those in Santa Clara County as a whole. Near Ames Research Center, an average of 22.7 percent of households are considered very low income and an average of 21.8 percent are considered low income. In Santa Clara County, 21.4 percent of households are considered very low income and 18.3 percent are considered low income. The tracts near Ames Research Center have an average of 44.5 percent combined low and very low income households, compared to 39.7 percent combined low and very low income households for Santa Clara County as a whole.

Individually, several census tracts near Ames Research Center have higher percentages of low and very low income households than the County as a whole. These include tracts 5046.01 (69 percent combined low and very low income), 5046.98 (61.4 percent combined low and very low income), 5048.03 (51.8 percent combined low and very low income), 5048.04 (52.7 percent combined low and very low income), 5052.01 (62.7 percent combined low and very low income), and 5093.04 (56 percent combined low and very low income).

TABLE 3.14-17 **INCOME DISTRIBUTION IN THE ENVIRONMENTAL JUSTICE STUDY AREA**

	< $25,000 (very low income)	$25,000 to $39,999 (low income)	$40,000 to $99,999	> $100,000	Combined Low and Very Low Income
5046.01	41.5	27.5	31.0	0	69.0
5046.98	34.4	26.9	37.5	1.2	61.3
5047	10.7	23.3	60.9	4.7	34.4
5048.02	21.9	19.3	53.8	4.9	41.2
5048.03	33.5	18.3	39.8	8.4	51.8
5048.04	28.6	24.1	43.1	4.2	52.7
5052.01	34.1	28.6	37.3	0	62.7
5089	22.6	24.6	46.3	6.5	47.2
5090	25.0	21.2	49.2	4.6	46.2
5091.02	16.4	18.0	58.6	7.0	34.4
5091.04	18.7	24.5	50.8	6.0	43.2
5092.01	20.9	22.2	49.1	7.7	43.1
5092.02	19.6	16.4	55.9	8.1	36.1
5093.04	23.0	33.0	41.8	2.2	56.0
5108.01	10.5	11.7	53.3	24.5	22.2
Moffett Area	22.7	21.8	48.7	6.8	44.5
Santa Clara County	21.4	18.3	48.9	11.4	39.7

4 ENVIRONMENTAL CONSEQUENCES

This chapter presents the environmental analysis of potential impacts from the five alternatives described in Chapter 2 of this EIS. It is divided into fourteen sections, each of which covers a potential area of impact addressed in Chapter 3, such as traffic and circulation or noise. Some of the sections begin with a description of the methodology used, if appropriate. Each section includes standards used to judge the significance of potential impacts. The section then describes the potential impacts of each alternative and lists measures to mitigate them.

NEPA does not have a single set of standards against which proposed actions can be evaluated. Therefore, criteria for assessing the significance of impacts for all sections were based on professional standards and, to some degree, on the State's guidelines for implementation of the California Environmental Quality Act (CEQA) (Public Resources Code 21000 *et seq.*). Although the proposed action is not subject to CEQA, the State's CEQA guidelines provide thorough standards that served as benchmarks in preparing this EIS.

Impacts are numbered consecutively regardless of the alternatives to which they apply. Impact numbers begin with a reference to the section they are related to, such as "GEO" for geology or "CIR" for traffic and circulation. After each numbered impact is a list of the alternatives to which the impact applies.

All impacts are significant prior to mitigation unless noted otherwise. All mitigation measures would reduce impacts to a less-than-significant level unless stated otherwise.

4.1 PUBLIC POLICY

This section identifies the alternatives' conformity with NASA, Santa Clara County, Mountain View and Sunnyvale policy.

A. Standards of Significance

An alternative for the NASA Ames Development Plan (NADP) would have a significant impact with regard to policy consistency if it would:

- Conflict with existing NASA policies or long-range goals.
- Conflict with local policies or long-range planning goals.

B. Impact Discussion

This section discusses the potential conflicts between relevant public policies and each of the five proposed alternatives for the NADP. These involve direct conflicts between the policy decisions that form the basis of each of the alternatives and NASA and local policy. These direct policy impacts are treated in depth in this section and mitigation measures for them are proposed.

1. NASA Policy

Among the laws, plans, and policies that guide NASA's planning for the future of Ames Research Center are the National Aeronautics and Space Act of 1958 (42 U.S.C. § 2451 *et seq.*) and the NASA Ames Proposed Six Point Initiative. This section describes the relationship between the five alternative development scenarios and these two documents.

a. Space Act

The National Aeronautics and Space Act of 1958 (Space Act) is NASA's implementing legislation that sets its objectives, procedures, and policies, as described in Chapter 3 of this EIS. Relevant Space Act objectives include those relating to the expansion of human knowledge of Earth and space, the development and improvement of aeronautical and space vehicles, the effective

use of U.S. engineering and research resources, and the preservation of the U.S.'s leadership role in aeronautical and space science and technology.

The alternatives would bear the following relationships to the Space Act:

- Alternative 1 would maintain existing and approved uses at Ames Research Center, which are currently consistent with the Space Act.
- Alternatives 2 through 5 would further NASA's mission in relation to the objectives outlined by the Space Act by promoting research collaboration between NASA and government agencies, universities, private industry and non-profit organizations for the development of new technologies and the advancement of human knowledge about space, the Earth, and society.

b. NASA Ames Proposed Six Point Initiative

In 1997, as the basis of a joint agreement with the Cities of Mountain View and Sunnyvale, NASA proposed the Six Point Initiative to describe new uses of Ames Research Center that would be consistent with NASA's mission and would respond to the CAC's recommendation for the reuse of Moffett Field. The Six Point Initiative aims to expand commercial space product development and the Ames Technology Commercialization Center (ATCC); to develop information technology institutes, an Astrobiology Institute, and the California Air and Space Center; and to extend the Bay Trail through the northern portion of Ames Research Center and along its northern border.

The alternatives for the NADP would bear the following relationships to the Six Point Initiative:

- Alternative 1 would not include any new development above the Baseline, which would meet five of the points included in the Six Point Initiative.
- Alternatives 2 through 5 would incorporate and expand upon all of the proposed points in the Initiative.

c. Joint Policy Efforts

The elements of joint Mountain View and Sunnyvale Policy relevant to the NADP include the Final Report of the Citizens Advisory Committee on Moffett Federal Airfield and the Moffett-Cities Agreement, as described in Section 3.1 of this EIS. This section describes the relationship between the five alternative development scenarios and these joint policy documents.

i. Community Advisory Committee on Moffett Federal Airfield

The Community Advisory Committee (CAC) on Moffett Federal Airfield was formed in 1996 and consisted of 19 members: nine each from Mountain View and Sunnyvale, and one representing the Santa Clara Cities Association, as described in Chapter 3 of this EIS. The CAC focused its efforts primarily on identifying new uses for Ames Research Center that would maintain NASA as the Center's federal steward. The CAC endorsed NASA's Six Point Initiative, as described above, and developed various recommendations about appropriate land uses.

Alternatives 1 through 5 would be compatible with the CAC's recommendations. All five alternatives are also compatible with the CAC's recommendations that discourage expanded use of the airfield.

ii. Ames Cities Agreement

In 1998, the City of Sunnyvale, the City of Mountain View, and NASA signed a Memorandum of Understanding that established a federal-local collaboration to seek to develop a shared-use, Research and Development campus at Ames Research Center, as described in Chapter 3 of this EIS. The collaboration focuses on five priority areas: establishing the California Air and Space Center, facilitating the development of research institutes and joint ventures with information technology companies to pursue future technologies for aeronautic and space missions, establishing the Astrobiology Institute, expanding the ATCC, and pursuing a variety of collaboration involving government and commercial opportunities that support the mission of NASA.

The alternatives would relate to the Ames Cities Agreement in the following ways:

- Alternative 1 would meet all of the priority areas defined by the Ames Cities Agreement except for establishment of the California Air and Space Center, but not to as great an extent as the other alternatives.
- Alternative 2, 3, 4, and 5 would include all of the priority areas set out in the Ames Cities Agreement.

2. Local and Regional Land Use Policy

As noted in Section 3.1, NASA is a federal agency and is not bound to follow local land use policies and regulations. However, NASA attempts to do so whenever possible.

To this end, the preparation of this EIS has included a full analysis of the consistency of the NADP with the local policies and regulations listed in Section 3.1. This analysis found no significant conflicts between the NADP and the policies of Santa Clara County, Mountain View, Sunnyvale, and the Midpeninsula Regional Open Space District (MROSD).

Because no significant conflicts were found, a detailed discussion of the relationship between planning policies and the five proposed alternatives is not included in this section. Instead, it can be found in Appendix A.

3. Cumulative Impacts

Since the NADP and its alternatives would create no inconsistency with NASA, local or regional policies, there is no way that the NADP could combine with the cumulative projects listed in Chapter 2 to create cumulative policy impacts.

C. Impacts and Mitigation Measures

No significant impacts are identified in Section B. Hence, no mitigation measures are required.

4.2 LAND USE

This section identifies potential impacts on existing land uses within Ames Research Center and its surrounding area from each of the five alternatives.

A. Standards of Significance

An alternative for the NASA Ames Development Plan (NADP)would have a significant impact with regard to land use if it would:

- Introduce new land uses incompatible with established uses at or surrounding Ames Research Center.
- Create uses that would be incompatible with land uses planned under the General Plans of Santa Clara County or the Cities of Mountain View and Sunnyvale.
- Conflict with existing use of Moffett Airfield.

B. Impact Discussion

This section discusses potential conflicts with existing and planned land uses for Ames Research Center and the area surrounding it for each of the five proposed alternatives. The land use analysis calls out two different kinds of impacts. The first involves direct conflicts between the land uses included in the alternatives and the existing and planned land uses at Ames Research Center and the surrounding area. Direct conflicts could arise if new uses generated substantial amounts of noise, pollution, or types of traffic that significantly impacted surrounding areas. These direct conflicts between new and existing land uses are treated in depth in this section, and mitigation measures for them are proposed.

The second type of impact discussed involves potential impacts on existing and planned land uses from the secondary effects of the new development proposed in the alternatives. Here impacts would arise not from direct conflicts between land uses, but from potential secondary impacts generated by the new land uses,

such as increases in traffic congestion. These secondary impacts are discussed briefly in the Land Use section, but detailed analysis and mitigation measures are located in the relevant sections, such as Section 4.3: Traffic and Circulation and Section 4.4: Air Quality.

1. Existing Land Uses

As described in Section 3.2 of this EIS, the primary existing land uses at Ames Research Center are office, research and development, maintenance, storage, retail, and open space. Uses in surrounding areas include office, research and development, light industrial, residential, commercial and open space.

The land uses introduced under each of the five alternatives would relate to existing land uses within Ames Research Center and its surrounding areas in the following ways:

- Under Alternative 1, no new development beyond the approved baseline would occur at Ames Research Center. The impacts of this development were previously described in the 1994 Comprehensive Use Plan (CUP) and California Air National Guard (CANG) EAs, which both resulted in Findings of No Significant Impact (FONSIs). No additional uses with noise, air quality, or heavy truck traffic impacts would be introduced, so there would be no conflicts with established uses at the Center or in the areas of Mountain View and Sunnyvale surrounding it.
- Under Alternatives 2 through 4, new land uses within Ames Research Center would include office, education, research and development, university, museum, light industrial, conference center, a disaster training center, housing, and retail uses, as described in Chapter 2 of this EIS. Under Alternative 5, new land uses would be the same as in Alternatives 2 through 4, except that no disaster training center would be constructed.

  The new uses included in Alternatives 2 through 5 would be compatible with existing uses at Ames Research Center and its immediate surroundings because no new uses with direct noise, air quality, or heavy truck traffic impacts would be introduced. The exception to this would be impacts from construction during the years when development proposed under the

NADP is being constructed. These impacts are addressed in Section 4.4: Air Quality and Section 4.10: Noise.

There would also be indirect land use impacts through increases in demand for basic infrastructure and services. New traffic generated would have impacts on local roadways and air quality. The increase in the daily human population at Ames Research Center could also adversely affect the burrowing owl population. These impacts are addressed in the individual topical sections in this chapter of the EIS.

With the exception of construction traffic, there would be no direct conflicts between the land uses proposed in the five alternatives and existing land uses at Ames Research Center or in the surrounding areas of Mountain View or Sunnyvale. Potential indirect impacts indicated above are analyzed in Section 4.3: Traffic and Circulation, Section 4.4: Air Quality, Section 4.5: Infrastructure and Drainage, Section 4.6: Services, Section 4.9: Biological Resources, Section 4.10: Noise, and Section 4.14: Socio-Economics.

2. Cumulative Planned Uses

As described in Section 3.2 of this EIS above, planned cumulative land uses in the areas of Mountain View and Sunnyvale surrounding Ames Research Center include office, research and development, industrial, and recreational open space. The land uses introduced under each of the five alternatives would relate to planned land uses within the areas surrounding Ames Research Center in the following ways:

- Under Alternative 1, no new land uses would be created at Ames Research Center, so there would be no incompatibilities with land uses planned under the General Plans of the Cities of Mountain View and Sunnyvale.
- Under Alternatives 2 through 5, the new office, research and development, educational, retail, visitor attraction, housing, and open space land uses created would have no direct conflicts with planned land uses through the generation of noise or air quality impacts.

None of the land uses proposed under any of the five alternatives for the NADP would have significant impacts on any of the land uses planned for adjacent areas of Mountain View and Sunnyvale.

3. Airfield Operations

The major land use considerations for the areas surrounding Moffett Federal Airfield are to ensure that any new land uses do not interfere with safety clearances established by federal regulations and will not be adversely affected by the noise generated by airfield operations.

The NADP does not propose any changes to the operations of Moffett Federal Airfield. The only functional change to the airfield would be the relocation of the air traffic control tower to the Eastside/Airfield area, in a location to be determined by specific studies. This relocation would be subject to separate review by the FAA.

Ames Research Center has applied Federal Aviation Administration (FAA) civilian standards to determine adjacent land uses and airport operating clearances for Moffett Field. The controlling documentation regarding such clearances and design criteria are based on FAA Regulations Part 77, and a review of these requirements was completed in parallel with NADP planning efforts.

None of the construction proposed under the NADP would violate or affect the navigable airspace of the airfield. No proposed development would penetrate the Transitional Surface described in Section 3.2, nor would any structures be built within the Building Restriction Line. New construction along Cody Road would not intrude into the runway clearances, taxiway clearances, or proposed apron clearances.

As stated in Section 3.2, Hangars 1, 2 and 3 are considered to be in violation of federal airspace regulations because they exceed the Transitional Surface slope, but because they predate existing federal regulations, and because they are part of the Shenandoah Plaza Historic District, there are no plans to alter the

structure of the hangars. The NADP proposes to change the use of Hangar 1 from a dirigible hangar to an educational facility. Any alterations to the structure would comply with all historic preservation requirements outlined in the HRPP. Although the change in use would involve no changes to the exterior character of the hangar, preliminary alteration plans would also be submitted to the FAA as a "notice of construction."

Because the NADP does not propose any changes to airfield operations, no changes to the existing noise levels would occur. As demonstrated in Figure 3.10-7, existing noise levels in the Eastside/Airfield area do not exceed 65 dB outside the area immediately surrounding the runways. Housing proposed in the NRP and Bay View areas would be in areas where noise exposure due to airfield operations is less than 60 dB CNEL, based on current airfield operations. Therefore, there would be no noise impacts to adjacent land uses under the proposed NADP.

Overall, no impacts to or from airfield operations would occur.

C. Impacts and Mitigation Measures

As explained above, there would be no significant conflicts with existing or planned land uses under any of the five alternatives, and thus no mitigation measures would be necessary.

It is possible that proposed changes in land use within Ames Research Center could have indirect impacts on traffic, noise, air quality, infrastructure, services, and biological resources. These impacts are in the relevant sections of this chapter.

4.3 TRAFFIC AND CIRCULATION

This section describes potential impacts on automobile, bicycle, and pedestrian traffic at the Ames Campus and in the local study area from the implementation of the NASA Ames Development Plan.

A. Standards of Significance

An alternative for the NASA Ames Development Plan would have significant impact with respect to traffic and circulation if it would result in:

- Increased vehicle trips or traffic congestion - the methodologies used to assess this impact follow those described in *Transportation Impact Analysis Guidelines* produced by the Santa Clara Valley Transportation Authority (VTA) as part of its Congestion Management Program (CMP), as well as City of Mountain View and Sunnyvale guidelines. The indicator of significant impact varies by facility type as summarized in Table 4.3-1.
- Insufficient parking capacity on-site or off-site.
- Hazards to safety from design features (e.g., sharp curves or dangerous intersections) or incompatible uses.
- Inadequate emergency access or access to nearby uses.
- Hazards or barriers for pedestrians or bicyclists.
- Conflicts with policies supporting alternative transportation (e.g. bus turnouts, bicycle racks).
- Alterations to rail, waterborne, or air travel modes.

B. Impact Discussion

Implementation of the NADP would increase the demand for transportation infrastructure and services both within the project area and the region. The transportation component of the NADP includes improvements for the circulation system within the Ames Campus, as well as strategies to minimize

TABLE 4.3-1 **TRAFFIC CONGESTION IMPACT CRITERIA**

Affected Agency	**Cumulative Operations** Without the Project	**Significant Impact Occurs if the Project:**
Signalized Intersections		
Mountain View and Sunnyvale (Local)	LOS D or better	Degrades operations to LOS E or F.
	LOS E or F	Increases the critical delay by four or more seconds and increases the critical V/C ratio by 0.01 or more OR Causes a decrease in the critical delay, but increases the critical V/C ratio by 0.01 or more.
Sunnyvale (Local) only[1]	LOS A, B or C	Causes an intersection to degrade to a lower level (e.g., LOS B to C, LOS C to D)
CMP	LOS E or better	Degrades operations to LOS F.
	LOS F	Increases the critical delay by four or more seconds and increases the critical V/C ratio by 0.01 or more OR Causes a decrease in the critical delay, but increases the critical V/C ratio by 0.01 or more.
Unsignalized Intersections		
All jurisdictions	LOS D or better	Degrades to LOS E or F, and causes intersection to meet or exacerbate peak hour signal warrant criteria
Freeway Segments		
All jurisdictions	LOS F[2]	Increases volume by more than one percent of capacity

Note: "+" and "-" designations for intersection LOS identify ranges of delay. A "+" indicates that the intersection is on the better end of the range for a particular LOS, with shorter delays, while a "-" indicates that the intersection is on the worse end of the range for a particular LOS.

[1] The City of Sunnyvale examines all changes in LOS grade (e.g., LOS C to C-) to determine if minor improvements can be implemented to minimize even less than significant impacts.
[2] Since future cumulative freeway levels of service beyond five (5) years are difficult to predict, the impact to freeway segments is considered *potentially* significant if the existing LOS is E or F.

or mitigate impacts on the regionally-significant and local facilities that provide access to the Center.

1. Effects on Roadways

The amount of traffic distributed to the study roadways was estimated using the three-step process of: 1) trip generation, 2) trip distribution, and 3) trip assignment. This process is described below, followed by an analysis of impacts on local and regional roadways.

a. Trip Generation

In the first step in the forecasting process, the number of new trips generated by each of the proposed development alternatives is calculated by applying trip generation rates for the different land use types proposed within the four planning areas. The trip generation rates used in this study were taken from the Institute of Transportation Engineer's (ITE's) *Trip Generation* (Sixth Edition), with the following exceptions and clarifications:

- **The California Air and Space Center Museum and Exhibit Space, and the Computer History Museum.** Rates for this type of use are not included in the *Trip Generation* manual. Therefore, project-specific rates were developed using information from several existing aerospace and science museums, and the expected operating hours, staffing levels, and daily attendance.
- **University Uses.** The proposed university uses would include educational facilities for resident and "commuter" students including extension classes. Facilities would include dry labs, teaching labs, and classrooms plus administrative offices for faculty and staff. Under all alternatives, the total University-designated square meters (square footage) was assumed to include 58 percent classroom and lab space and 42 percent office uses based on input from representatives of the University California at Santa Cruz. ITE rates were used for each of these uses, respectively.
- **Student Apartments and Dormitories.** In the University area, student apartments and dormitories would be provided to students, faculty, and staff. Each unit is expected to house two persons. Since these individuals

would all be affiliated with the University uses, their travel behavior would be unlike that of typical apartment dwellers because they would have more flexible schedules and would tend to generate more trips. Accordingly, the gross trip rate used for these units (1.28 to 1.50 trips per unit) is actually higher than that of a typical single-family residence (1.0 per unit), and more than double the industry standard apartment rate of 0.51 to 0.60 trips per unit in the peak hour. For this analysis, 65 percent of persons are assumed to travel during the peak hour. A majority (75 percent) of these trips are assumed to be via foot, bike or shuttle to uses within the Ames Campus area.

— **Townhome and Apartment Units.** Housing on-site would be medium- to high-density multi-family in nature, and would only be available to on-site employees, faculty or students. The majority of travel made by these individuals during the peak period would generally be completed within Moffett Field and would involve fewer home-based work trips than typical apartment residents because of the Center's internal shuttle service (see discussion of on-site housing reductions on the following page). On-site employees and students in townhome and apartment units may or may not have a spouse and/or family members. For this use, 75 percent of on-site employees were assumed to travel during the peak hour. In addition, the trip rate was increased to account for working spouses, of which 50 percent were assumed to travel during the peak hour. Because of these assumptions, the resulting gross trip rate for townhomes and apartments is 1.15 to 1.35 trips per unit during the peak hour, which is more than double the industry standard townhouse/condominium rate of 0.54 trips per unit and higher than the standard rate of 1.0 trips per unit for a single-family residence. Sixty-five percent of these trips are assumed to made within the campus area by foot, bike or shuttle.

— **Conference and Training Center.** No standard trip rates are available for this type of use. Trip rates were estimated based on the estimated number of outside daytime users and overnight guests, NRP and Ames Campus users, length of stay, and mode of transportation (i.e., rental car, taxi or public transit).

— **Disaster Training Facility**. No standard trip rates are available for this type of use. Rates were estimated based on the number of dormitory-style beds and the number of individuals expected to be on-site.

The resulting rates were used to calculate a gross number of daily, AM and PM peak hour trips based on the square meters (square footage), number of rooms, number of students, or dwelling units for each of the different proposed land use types within the four planning areas. The specific trip generation rates and resulting gross trips used for this analysis are shown in Appendix B.

The initial gross trip generation estimates were reduced to account for the proposed implementation of an aggressive TDM program, the provision of on-site amenities, and the effect of on-site housing where at least one resident is required to work or attend class at the Ames Research Center. As described in Chapter 2, the TDM program would include charging for parking, which is one of the most effective tools in encouraging the use of alternative travel modes. Local shuttle service would run to and from the VTA light rail and Caltrain stations, and would allow residents to travel to and from their work site without using a vehicle. All tenants will be required to comply with the TDM program.

A housing reduction was applied to account for on-site employment requirements and the typical proportion of work trips made during the peak commute periods. On-site uses such as child care, as well as amenities including bank machines, fitness centers, restaurants, etc. are also expected to result in reduced trip rates for employees and on-site residents. During the peak periods, the number of gross vehicle trips for each housing area was reduced by either 65 or 75 percent depending on the housing type (see descriptions above). This reduction represents persons traveling between a residence and an on-site employment/university location via a non-automobile mode. An equivalent reduction was proportionately applied to each employment/university location to account for trips made by on-site residents via shuttle, bicycling, or walking. In addition to parking costs

within the NRP serving as a disincentive to driving, the provision of on-site amenities would reduce the need for on-site residents to drive to off-site locations to obtain some services. A daily on-site housing reduction of 35 percent was estimated based on the amount of travel usually associated with work trips.

A reduction was replied to the remaining vehicle trips (gross trips minus housing reductions) to account for the effect of an extensive TDM program. As described in Chapter 2, the TDM program would include charging for parking, which is one of the most effective tools in encouraging the use of alternative travel modes, frequent shuttle service and other provisions. Local shuttle service would run to and from the VTA light rail and Caltrain stations, and would allow residents to travel to and from their work site without using a vehicle. Working spouses or roommates of on-site residents would be able to use these amenities to reduce their overall vehicle trip-making. All tenants would be required to comply with the TDM program, which is expected to result in a 22 percent trip reduction compared to typical commute patterns for Santa Clara County employees.[1] NASA already achieves a 17 percent reduction at the Ames Research Center without the major components of the proposed project's TDM program.

A summary of the trip generation for each plan area under each alternative is shown in Tables 4.3-2 through 4.3-5. A comparison of the project trip generation calculations for all alternatives, and including the Mitigated Alternative 5, is shown in Table 4.3-5A. These trips would be in addition to the future cumulative trips generated by baseline projects in Alternative 1 and shown in Table 3.3-8.

[1] Source:"*Commute Profile 2000, A Survey of Bay Area Commute Patterns*" conducted by RIDES for Bay Area Commuters.

b. Trip Distribution

The second step consists of forecasting the travel direction of project-generated trips by assigning trips to specific transportation facilities on the basis of trip distribution percentages. The trip distribution was estimated based on two sources: 1) data provided by MTC showing the residence of employees in the Sunnyvale-Mountain View area for Year 2000 through 2020, and 2) the City of Mountain View traffic model. The MTC data was used to establish the regional distribution of trips on major highways in the South Bay Area (Highways 101, 237, 85, 280, 680, and 880), while the Mountain View model was used to better approximate the amount of traffic on arterial roadways in the immediate project area. Figure 4.3-1 shows the distribution of project trips within the immediate study area.

c. Trip Assignment

The final step of this process is to assign project trips to specific roadways based on the trip distribution described above and the turning movements at each intersection. This assignment was performed using the TRAFFIX model, which was ultimately used to calculate intersection LOS. Project-only volumes are illustrated on Figures 4.3-2 through 4.3-5 for Alternatives 2 through 5, respectively. It is important to note that the intensity of proposed land uses changes locations between alternatives (e.g., some have more density in the NRP, while others include extensive development in Bay View). Thus, volumes at a given intersection under an alternative may be higher than those for another alternative, even though the first alternative generates a lower number of total daily or peak hour trips.

d. Impacts on Intersection Operations

The project volumes generated by each alternative were added to the Future Cumulative No Project volumes shown in Section 3.3 and the LOS was re-calculated for each location. The results of the Future Cumulative Plus Project Conditions analysis is presented in Tables 4.3-6 through 4.3-9 for Alternatives 2 through 5, respectively. Besides showing the projected LOS at each intersection without and with the proposed project, these tables include the change in critical delay and the change in the critical volume-to-capacity

TABLE 4.3-2 **PROJECT TRIP GENERATION SUMMARY - ALTERNATIVE 2**

	Trips						
		AM			PM		
	Daily	In	Out	Total	In	Out	Total
Bay View Total	9,209	886	363	1,249	396	888	1,285
On-site Housing Reduction	-1,371	-137	-188	-325	-206	-176	-382
TDM Trip Reductions	-1,724	-165	-38	-203	-42	-157	-199
Net Bay View Trips	6,114	584	137	721	148	555	704
Eastside/Airfield Total	8,366	578	114	692	138	539	677
On-site Housing Reduction	-648	-129	-25	-154	-59	-121	-180
TDM Trip Reductions	-463	-27	-5	-32	-5	-25	-30
Net Eastside/Airfield Trips	7,255	422	84	506	74	393	467
Ames Campus Total	0	0	0	0	0	0	0
On-site Housing Reduction	0	0	0	0	0	0	0
TDM Trip Reductions	0	0	0	0	0	0	0
Net Ames Campus Trips	0	0	0	0	0	0	0
NRP Total	15,919	1,181	707	1,888	792	1,672	2,464
On-site Housing Reduction	-2,971	-326	-379	-704	-429	-398	-826
TDM Trip Reductions	-3,872	-340	-85	-425	-100	-419	-520
Net NRP Trips	9,076	515	243	759	263	855	1,118
Total Net Trips	**22,445**	**1,521**	**464**	**1,986**	**485**	**1,803**	**2,289**

Note: A standard TDM reduction of 22 percent was applied to all areas except the Eastside/Airfield, where a TDM reduction of 6 percent was applied. The TDM reduction for the NRP area may appear to be higher than 22 percent; however, this is caused by the increased on-site housing reduction provided by the already approved uses in the NASA Research Park under the CUP (i.e., some CUP employees will live in the on-site housing). A review of the detailed trip generation estimates included in the appendix illustrates all of the reductions.

TABLE 4.3-3 **PROJECT TRIP GENERATION SUMMARY - ALTERNATIVE 3**

	Trips						
		AM			PM		
	Daily	In	Out	Total	In	Out	Total
Bay View Total	0	0	0	0	0	0	0
On-site Housing Reduction	0	0	0	0	0	0	0
TDM Trip Reductions	0	0	0	0	0	0	0
Net Bay View Trips	0	0	0	0	0	0	0
Eastside/Airfield Total	3,220	287	63	350	83	263	346
On-site Housing Reduction	-208	-43	-8	-51	-20	-40	-60
TDM Trip Reductions	-181	-15	-3	-18	-4	-13	-17
Net Eastside/Airfield Trips	2,831	229	51	281	60	210	269
Ames Campus Total	0	0	0	0	0	0	0
On-site Housing Reduction	0	0	0	0	0	0	0
TDM Trip Reductions	0	0	0	0	0	0	0
Net Ames Campus Trips	0	0	0	0	0	0	0
NRP Total	21,153	1,872	817	2,689	991	2,556	3,548
On-site Housing Reduction	-3,092	-362	-397	-758	-455	-435	-890
TDM Trip Reductions	-4,997	-484	-106	-590	-139	-606	-744
Net NRP Trips	13,064	1,026	314	1,341	457	1,515	1,914
Total Net Trips	**15,895**	**1,255**	**365**	**1,622**	**517**	**1,725**	**2,183**

Note: A standard TDM reduction of 22 percent was applied to all areas except the Eastside/Airfield, where a TDM reduction of 6 percent was applied. The TDM reduction for the NRP area may appear to be higher than 22 percent; however, this is caused by the increased on-site housing reduction provided by the already approved uses in the NASA Research Park under the CUP (i.e., some CUP employees will live in the on-site housing). A review of the detailed trip generation estimates included in the appendix illustrates all of the reductions.

TABLE 4.3-4 **PROJECT TRIP GENERATION SUMMARY - ALTERNATIVE 4**

	Trips						
		AM			PM		
	Daily	In	Out	Total	In	Out	Total
Bay View Total	19,123	1,887	793	2,680	877	2,093	2,969
On-site Housing Reduction	-2,980	-286	-402	-688	-438	-370	-808
TDM Trip Reductions	-3,551	-352	-86	-438	-97	-379	-476
Net Bay View Trips	12,592	1,249	305	1,554	342	1,344	1,686
Eastside/Airfield Total	9,244	707	132	839	162	656	818
On-site Housing Reduction	-750	-146	-28	-173	-67	-136	-203
TDM Trip Reductions	-510	-34	-6	-40	-6	-31	-37
Net Eastside/Airfield Trips	7,984	528	98	625	89	489	577
Ames Campus Total	0	0	0	0	0	0	0
On-site Housing Reduction	0	0	0	0	0	0	0
TDM Trip Reductions	0	0	0	0	0	0	0
Net Ames Campus Trips	0	0	0	0	0	0	0
NRP Total	12,748	898	544	1,442	608	1,309	1,917
On-site Housing Reduction	-2,457	-283	-285	-568	-334	-332	-666
TDM Trip Reductions	-3,287	-287	-70	-357	-81	-354	-435
Net NRP Trips	7,004	328	189	517	193	623	816
Total Net Trips	**27,580**	**2,105**	**592**	**2,696**	**624**	**2,456**	**3,079**

Note: A standard TDM reduction of 22 percent was applied to all areas except the Eastside/Airfield, where a TDM reduction of 6 percent was applied. The TDM reduction for the NRP area may appear to be higher than 22 percent; however, this is caused by the increased on-site housing reduction provided by the already approved uses in the NASA Research Park under the CUP (i.e., some CUP employees will live in the on-site housing). A review of the detailed trip generation estimates included in the appendix illustrates all of the reductions.

TABLE 4.3-5 **PROJECT TRIP GENERATION SUMMARY - ALTERNATIVE 5**

	Trips						
		AM			PM		
	Daily	In	Out	Total	In	Out	Total
Bay View Total	7,245	138	725	863	678	334	1,013
On-site Housing Reduction	-2,536	-97	-508	-605	-476	-234	-710
TDM Trip Reductions	-1,036	-9	-48	-57	-45	-22	-67
Net Bay View Trips	3,673	32	169	201	157	78	236
Eastside/Airfield Total	0	0	0	0	0	0	0
On-site Housing Reduction	0	0	0	0	0	0	0
TDM Trip Reductions	0	0	0	0	0	0	0
Net Eastside/Airfield Trips	0	0	0	0	0	0	0
Ames Campus Total	3,850	461	95	556	76	432	508
On-site Housing Reduction	-600	-120	-23	-143	-55	-113	-168
TDM Trip Reductions	-715	-75	-16	-91	-5	-70	-75
Net Ames Campus Trips	2,535	266	56	322	16	249	265
NRP Total	15,668	1,217	552	1,768	659	1,798	2,457
On-site Housing Reduction	-3,897	-622	-308	-930	-453	-638	-1,091
TDM Trip Reductions	-3,613	-282	-67	-349	-66	-394	-460
Net NRP Trips	8,158	313	177	489	140	766	906
Total Net Trips	**14,366**	**611**	**402**	**1,012**	**313**	**1,093**	**1,407**

Note: A standard TDM reduction of 22 percent was applied to all areas except the Eastside/Airfield, where a TDM reduction of 6 percent was applied. The TDM reduction for the NRP area may appear to be higher than 22 percent; however, this is caused by the increased on-site housing reduction provided by the already approved uses in the NASA Research Park under the CUP (i.e., some CUP employees will live in the on-site housing). A review of the detailed trip generation estimates included in the appendix illustrates all of the reductions.

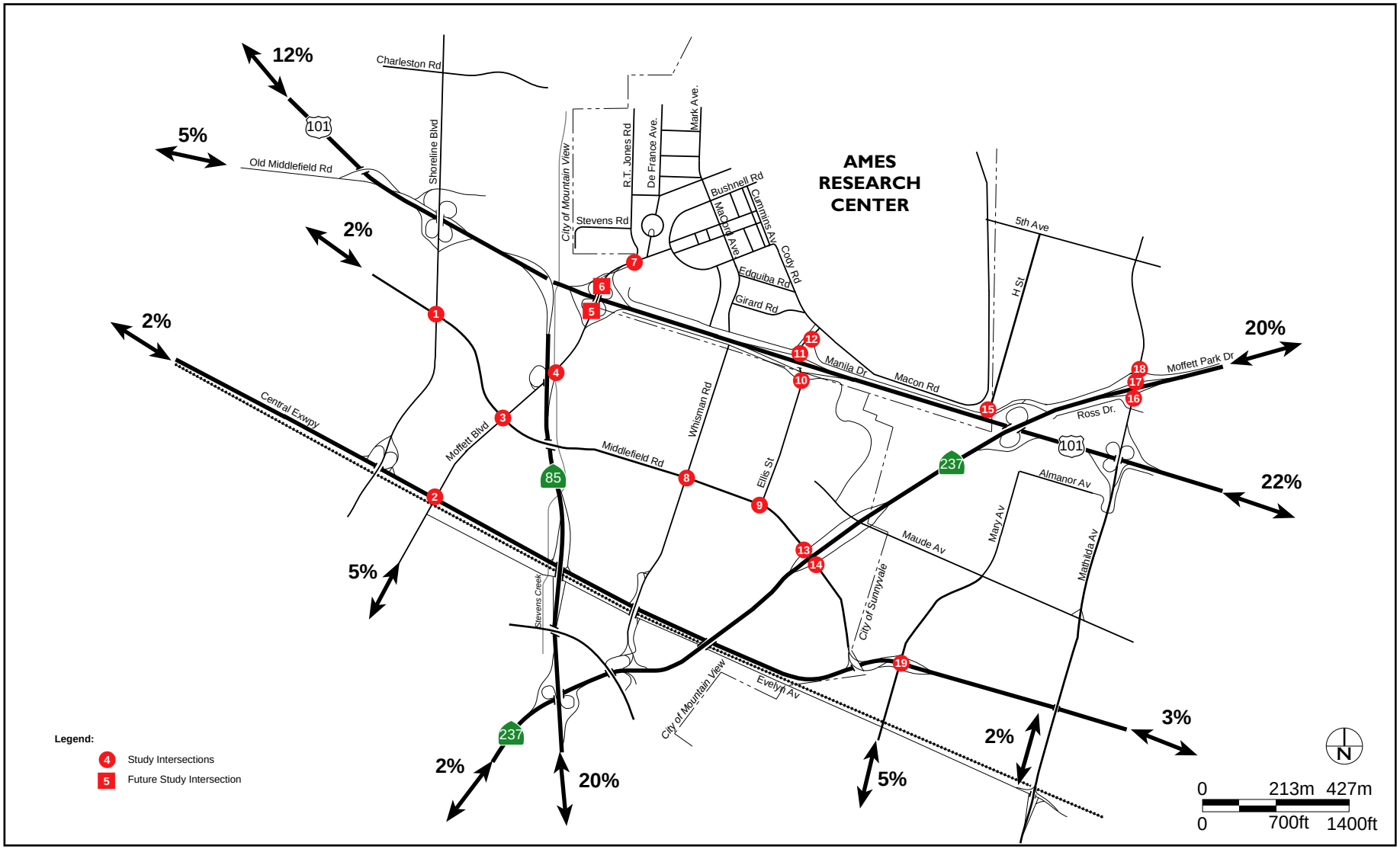
TABLE 4.3-5A **COMPARISON OF PROJECT TRIP GENERATION SUMMARY - ALL ALTERNATIVES**

	Total Net New Trips						
		AM			PM		
	Daily	In	Out	Total	In	Out	Total
Alternative 1 (No Project)	5,584	827	72	899	112	759	871
Alternative 2	22,455	1,521	464	1,986	485	1,803	2,289
Alternative 3	15,895	1,255	365	1,622	517	1,725	2,183
Alternative 4	27,580	2,105	592	2,696	624	2,456	3,079
Alternative 5	14,366	611	402	1,012	313	1,093	1,407
Mitigated Alternative 5*	14,880	-46	476	430	266	543	785

* For more information on Mitigated Alternative 5 trips, see Section 5.3.

(V/C) ratio. For the two unsignalized intersections (Moffett Boulevard/Clark Memorial Drive at R.T. Jones Road, and Ellis Street at Manila Drive), it should be noted that the data in the table represents the change in average control delay because of the different study methodology.

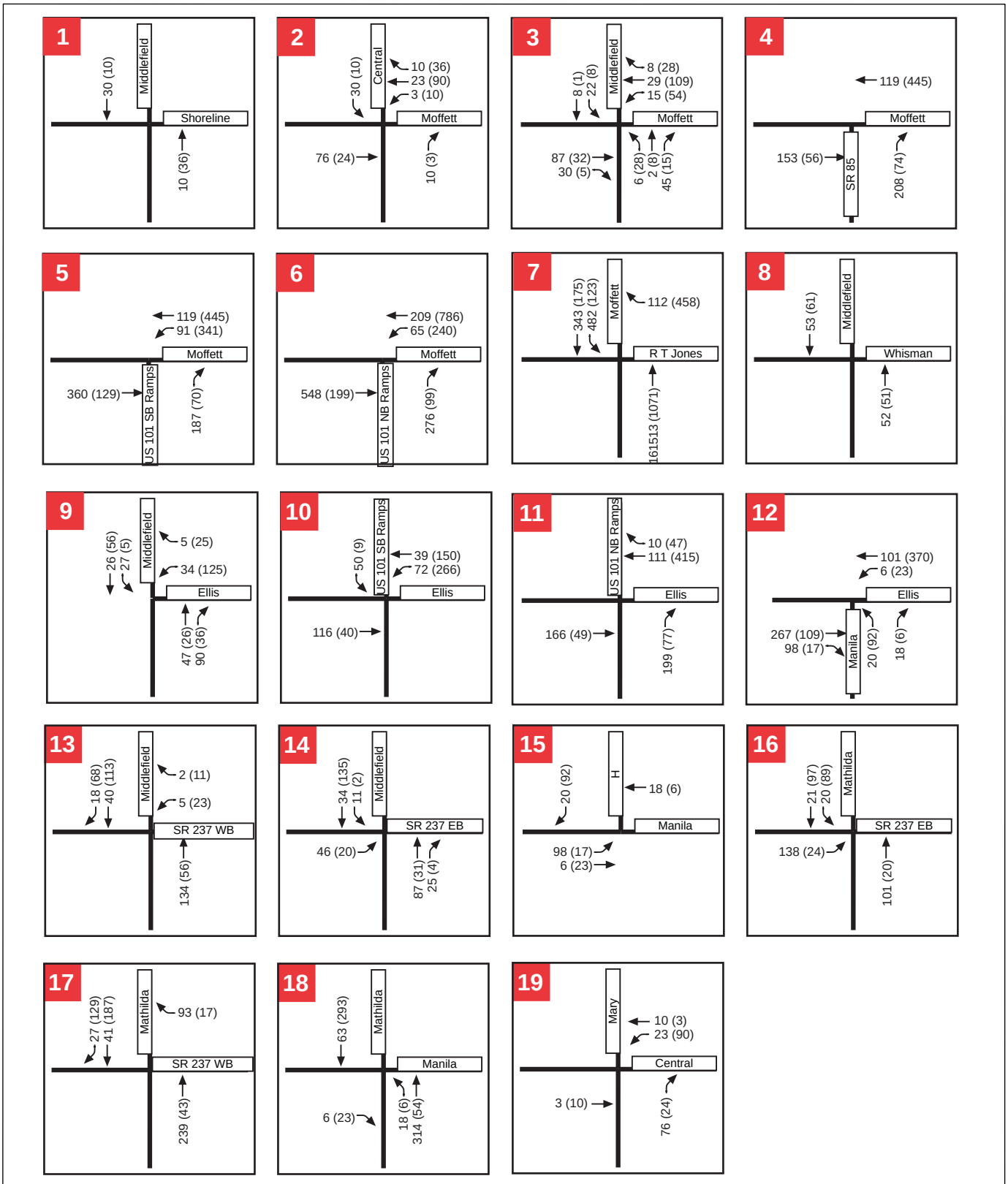
The results in Tables 4.3-6 through 4.3-9 show that implementation of the proposed project would cause varying numbers of study intersections to operate at unacceptable levels during the AM and/or PM peak hour. Under the Preferred Alternative (Alternative 5), one intersection would operate at unacceptable levels in both the AM and PM peak hour. Under Alternatives 2 and 3, seven intersections would operate at unacceptable levels in either or both the AM and PM peak hours. Under Alternative 4, there would be ten such intersections. Both unsignalized intersections are projected to experience excessive delay without installation of a traffic signal or changes to the existing lane configurations.



Source: Fehr & Peers Associates, Inc.

FIGURE 4.3-1

PROJECT TRIP DISTRIBUTION



not to scale

Source: Fehr & Peers Associates, Inc.

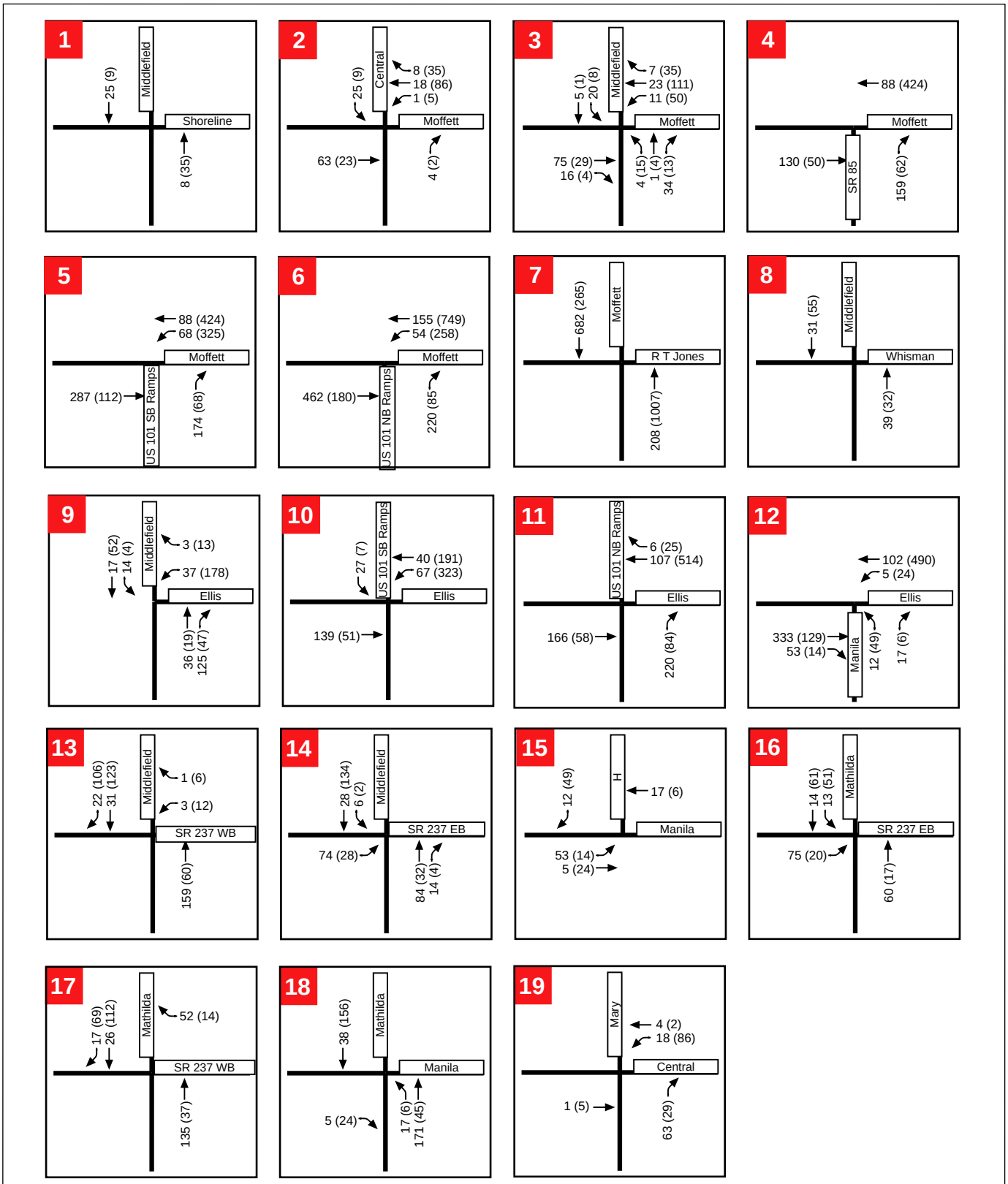
XX (YY) = AM (PM)
Peak Hour
Traffic Volumes

FIGURE 4.3-2

PROJECT TRIP ASSIGNMENT
ALTERNATIVE 2

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS



not to scale

Source: Fehr & Peers Associates, Inc.

XX (YY) = AM (PM)
Peak Hour
Traffic Volumes

FIGURE 4.3-3

PROJECT TRIP ASSIGNMENT
ALTERNATIVE 3

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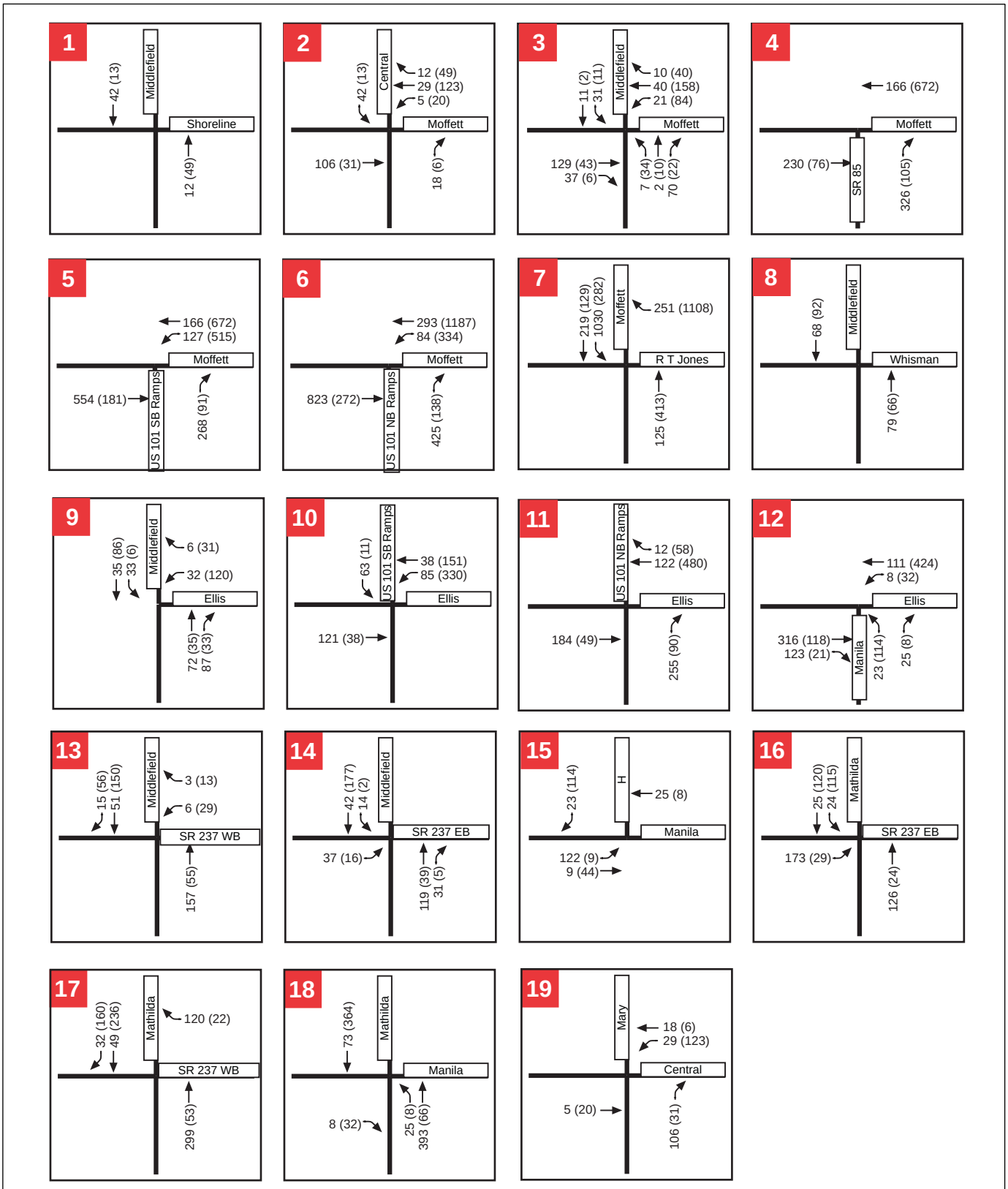


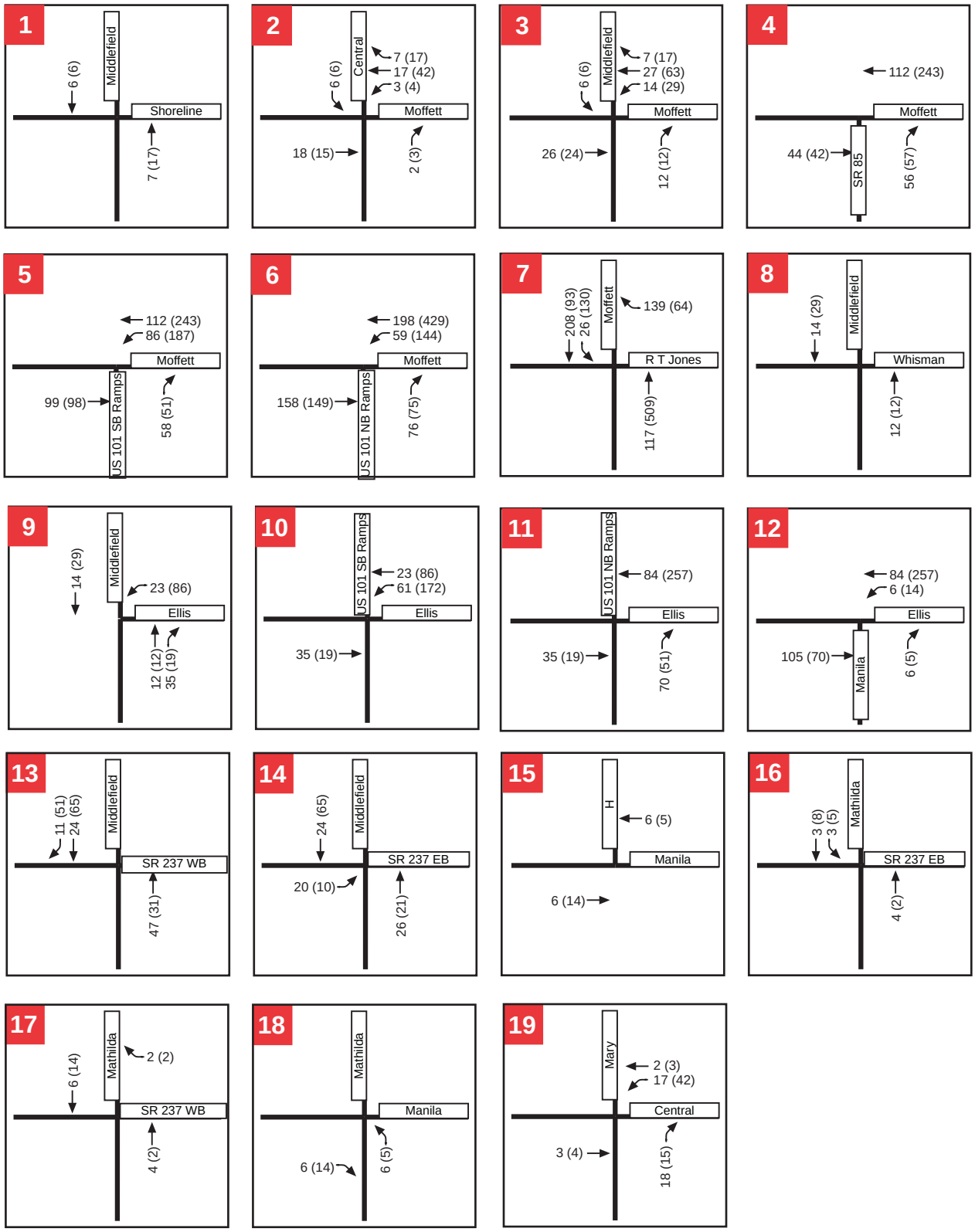
not to scale

Source: Fehr & Peers Associates, Inc.

XX (YY) = AM (PM)
Peak Hour
Traffic Volumes

FIGURE 4.3-4

PROJECT TRIP ASSIGNMENT
ALTERNATIVE 4



not to scale

Source: Fehr & Peers Associates, Inc.

XX (YY) = AM (PM)
Peak Hour
Traffic Volumes

FIGURE 4.3-5

PROJECT TRIP ASSIGNMENT
ALTERNATIVE 5

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TABLE 4.3-6: **YEAR 2013 CUMULATIVE CONDITIONS WITH AND WITHOUT ALTERNATIVE 2**

Intersection	Peak Hour	Year 2013 Cumulative Without Alternative 2		Year 2013 Cumulative Plus Alternative 2			
		Delay (sec)[1]	LOS[2]	Delay (sec)	LOS	Change in Delay[3]	Change in V/C[4]
Middlefield Road/	AM	*48.5*	*E*	48.6	E	+0.0	+0.000
Shoreline Boulevard	PM	*48.5*	*E*	48.9	E	+0.0	+0.000
Moffett Boulevard/	AM	48.0	E	55.8	E	+10.8	+0.050
Central Expressway	PM	53.4	E	**65.6**	**F**	**+12.2**	**+0.044**
Moffett Boulevard/	AM	36.1	D	**48.5**	**E**	**+21.0**	**+0.089**
Middlefield Road	PM	36.1	D	**43.8**	**E+**	**+10.4**	**+0.054**
Moffett Boulevard/	AM	11.3	B	15.0	C+	+4.7	+0.177
SR 85 NB Ramp	PM	5.6	B+	6.4	B+	+0.2	+0.130
Moffett Boulevard/	AM	10.3	B	16.0	C+	+7.5	+0.308
US 101 SB Ramps	PM	12.1	B	31.6	D	+39.5	+0.269
Moffett Boulevard/	AM	10.6	B	32.2	D	+29.0	+0.433
US 101 NB Ramps	PM	11.2	B	16.8	C+	+1.4	+0.327
Moffett Blvd.(Clark Road)/	AM	*63.8*	*F*	**217.8**	**F**	**+153.9**	**+0.517**
R.T. Jones Road	PM	*196.6*	*F*	**>360**	**F**	**+270.9**	**+0.720**
Whisman Road/	AM	13.6	B-	13.5	B-	-0.1	+0.016
Middlefield Road	PM	15.1	C+	15.0	B-	0.0	+0.018
Ellis Street/	AM	21.6	C	30.4	D	+12.2	+0.070
Middlefield Road	PM	17.2	C	19.5	C	+3.1	+0.066
Ellis Street/	AM	21.3	C	23.5	C-	+1.6	+0.023
US 101 SB Ramps	PM	16.8	C+	20.9	C	+5.5	+0.173
Ellis Street/	AM	18.2	C	18.9	C	+1.0	+0.049
US 101 NB Ramps	PM	11.8	B	11.9	B	-1.3	+0.066
Ellis Street/	AM	10.8	B	14.8	B	+4.0	+0.155
Manila Drive	PM	20.5	C	**53.6**	**F**	**+33.1**	**+0.297**
Middlefield Road/	AM	15.3	C+	15.6	C+	+0.7	+0.041
SR 237 WB Ramps	PM	19.4	C	21.6	C	+6.8	+0.050
Middlefield Road/	AM	19.3	C	19.6	C	+1.0	+0.035
SR 237 EB Ramps	PM	12.7	B	12.4	B	-0.3	+0.040
Manila Drive/	AM	7.1	B	8.1	B	+0.9	+0.077
H Street	PM	11.0	B	11.3	B	+0.5	+0.077
Mathilda Avenue/	AM	*100.5*	*F*	132.1	**F**	**+37.2**	**+0.054**
SR 237 EB Ramps	PM	17.3	C	18.5	C	+3.5	+0.022
Mathilda Avenue/	AM	*284.6*	*F*	**>360**	**F**	**+130.0**	**+0.092**
SR 237 WB Ramps	PM	*> 360*	*F*	**>360**	**F**	**>360**	**+0.080**
Manila Drive (Moffett Park	AM	*> 360*	*F*	**>360**	**F**	**>360**	**+0.063**
Ext.)/Mathilda Avenue	PM	*339.3*	*F*	**>360**	**F**	**+78.6**	**+0.059**
Central Expressway/	AM	*85.6*	*F*	86.5	F	+3.7	+0.009
Mary Avenue	PM	48.6	E	53.7	E	+15.8	+0.055

Note: Unacceptable operations without the project are shown in italics, while significant impacts are highlighted in bold and highlighted text.

[1] Whole intersection weighted average stopped delay expressed in seconds per vehicle (sec/veh) for signalized intersections, and total control delay in sec/veh for unsignalized intersections.
[2] LOS calculations for signalized intersections performed using the 1985 *Highway Capacity Manual* methodology contained in the TRAFFIX software package with adjusted saturation flow rates to reflect local conditions.
[3] LOS calculations for unsignalized intersections performed using the 1997 *Highway Capacity Manual* methodology contained in the TRAFFIX software package.
[4] Change in average critical delay between Background and Project Conditions.
[5] Change in critical volume/capacity (V/C).

TABLE 4.3-7: **YEAR 2013 CUMULATIVE CONDITIONS WITH AND WITHOUT ALTERNATIVE 3**

Intersection	Peak Hour	Year 2013 Cumulative Without Alternative 3 Delay (sec)[1]	LOS[2]	Year 2013 Cumulative Plus Alternative 3 Delay (sec)	LOS	Change in Delay[3]	Change in V/C[4]
Middlefield Road/	AM	*48.5*	*E*	48.6	E	+0.0	+0.000
Shoreline Boulevard	PM	*48.5*	*E*	48.9	E	+0.0	+0.000
Moffett Boulevard/	AM	48.0	E	54.2	E	+8.5	+0.041
Central Expressway	PM	53.4	E	**64.9**	**F**	**+11.7**	**+0.042**
Moffett Boulevard/	AM	36.1	D	**45.0**	**E**	**+15.2**	**+0.070**
Middlefield Road	PM	36.1	D	**43.4**	**E+**	**+10.3**	**+0.054**
Moffett Boulevard/	AM	11.3	B	13.7	B-	+3.2	+0.139
SR 85 NB Ramp	PM	5.6	B+	6.2	B+	+0.1	+0.124
Moffett Boulevard/	AM	10.3	B	14.8	B-	+6.0	+0.277
US 101 SB Ramps	PM	12.1	B	28.8	D	+34.1	+0.253
Moffett Boulevard/	AM	10.6	B	21.1	C	+14.6	+0.369
US 101 NB Ramps	PM	11.2	B	16.0	C+	+0.4	+0.315
Moffett Blvd. (Clark Road)/	AM	*63.8*	*F*	**278.4**	**F**	**+214.6**	**+0.748**
R.T. Jones Road	PM	*196.6*	*F*	**>360**	**F**	**>360**	**+1.250**
Whisman Road/	AM	13.6	B-	13.5	B-	-0.1	+0.009
Middlefield Road	PM	15.1	C+	15.0	C+	0.0	+0.016
Ellis Street/	AM	21.6	C	30.3	D	+12.0	+0.070
Middlefield Road	PM	17.2	C	20.4	C	+4.4	+0.085
Ellis Street/	AM	21.3	C	23.5	C-	+1.7	+0.023
US 101 SB Ramps	PM	16.8	C+	22.1	C	+7.3	+0.207
Ellis Street/	AM	18.2	C	18.9	C	+0.9	+0.049
US 101 NB Ramps	PM	11.8	B	11.9	B	-1.2	+0.089
Ellis Street/	AM	10.8	B	14.9	B	+4.1	+0.116
Manila Drive	PM	20.5	C	**49.0**	**E**	**+28.6**	**+0.240**
Middlefield Road/	AM	15.3	C+	15.7	C+	+0.9	+0.047
SR 237 WB Ramps	PM	19.4	C	22.9	C	+10.8	+0.072
Middlefield Road/	AM	19.3	C	19.6	C	+0.9	+0.036
SR 237 EB Ramps	PM	12.7	B	12.4	B	-0.3	+0.039
Manila Drive/	AM	7.1	B	7.7	B	+0.5	+0.046
H Street	PM	11.0	B	11.2	B	+0.3	+0.046
Mathilda Avenue/	AM	*100.5*	*F*	**118.2**	**F**	**+20.9**	**+0.031**
SR 237 EB Ramps	PM	17.3	C	18.2	C	+3.0	+0.014
Mathilda Avenue/	AM	*284.6*	*F*	**339.1**	**F**	**+69.7**	**+0.052**
SR 237 WB Ramps	PM	*>360*	*F*	**>360**	**F**	**>360**	**+0.043**
Manila Drive (Moffett Park	AM	*>360*	*F*	**>360**	**F**	**>360**	**+0.034**
Ext.)/Mathilda Avenue	PM	*339.3*	*F*	**>360**	**F**	**+50.9**	**+0.039**
Central Expressway/	AM	*85.6*	*F*	86.3	F	+3.0	+0.007
Mary Avenue	PM	48.6	E	53.4	E	+15.0	+0.053

Note: Unacceptable operations without the project are shown in italics, while significant impacts are highlighted in bold and highlighted text.

[1] Whole intersection weighted average stopped delay expressed in seconds per vehicle (sec/veh) for signalized intersections, and total control delay in sec/veh for unsignalized intersections.
[2] LOS calculations for signalized intersections performed using the 1985 *Highway Capacity Manual* methodology contained in the TRAFFIX software package with adjusted saturation flow rates to reflect local conditions.
[3] LOS calculations for unsignalized intersections performed using the 1997 *Highway Capacity Manual* methodology contained in the TRAFFIX software package.
[4] Change in average critical delay between Background and Project Conditions.
[5] Change in critical volume/capacity (V/C).

TABLE 4.3-8: **YEAR 2013 CUMULATIVE CONDITIONS WITH AND WITHOUT ALTERNATIVE 4**

		Year 2013 Cumulative Without Alternative 4		Year 2013 Cumulative Plus Alternative 4			
Intersection	Peak Hour	Delay (sec)[1]	LOS[2]	Delay (sec)	LOS	Change in Delay[3]	Change in V/C[4]
Middlefield Road/	AM	*48.5*	*E*	48.6	E	+0.0	+0.000
Shoreline Boulevard	PM	*48.5*	*E*	49.1	E	+0.0	+0.000
Moffett Boulevard/	AM	48.0	E	**59.5**	**E-**	**+16.1**	**+0.069**
Central Expressway	PM	53.4	E	**70.9**	**F**	**+17.5**	**+0.059**
Moffett Boulevard/	AM	36.1	D	**57.6**	**E-**	**+36.4**	**+0.130**
Middlefield Road	PM	36.1	D	**48.6**	**E**	**+16.8**	**+0.078**
Moffett Boulevard/	AM	11.3	B	21.1	C	+13.3	+0.274
SR 85 NB Ramp	PM	5.6	B+	7.3	B	+1.0	+0.196
Moffett Boulevard/	AM	10.3	B	26.4	D+	+20.4	+0.423
US 101 SB Ramps	PM	12.1	B	**66.3**	**F**	**+109.0**	**+0.402**
Moffett Boulevard/	AM	10.6	B	**109.5**	**F**	**+126.4**	**+0.618**
US 101 NB Ramps	PM	11.2	B	35.2	D	+29.5	+0.451
Moffett Blvd. (Clark Road)/	AM	*63.8*	*F*	**>360**	**F**	**+345.1**	**+1.692**
R.T. Jones Road	PM	*196.6*	*F*	**>360**	**F**	**>360**	**+1.855**
Whisman Road/	AM	13.6	B-	13.4	B-	-0.2	+0.020
Middlefield Road	PM	15.1	C+	15.0	B-	0.0	+0.027
Ellis Street/	AM	21.6	C	32.2	D	+14.7	+0.080
Middlefield Road	PM	17.2	C	19.4	C	+3.2	+0.067
Ellis Street/	AM	21.3	C	23.7	C-	+1.6	+0.022
US 101 SB Ramps	PM	16.8	C+	22.7	C	+7.8	+0.214
Ellis Street/	AM	18.2	C	19.0	C	+1.0	+0.055
US 101 NB Ramps	PM	11.8	B	11.9	B	-1.2	+0.089
Ellis Street/	AM	10.8	B	16.2	C	+5.4	+0.194
Manila Drive	PM	20.5	C	**62.9**	**F**	**+42.5**	**+0.351**
Middlefield Road/	AM	15.3	C+	15.7	C+	+0.9	+0.048
SR 237 WB Ramps	PM	19.4	C	21.3	C	+5.7	+0.044
Middlefield Road/	AM	19.3	C	19.6	C	+1.1	+0.036
SR 237 EB Ramps	PM	12.7	B	12.2	B	-0.3	+0.052
Manila Drive/	AM	7.1	B	8.4	B	+1.2	+0.098
H Street	PM	11.0	B	11.4	B	+0.7	+0.096
Mathilda Avenue/	AM	*100.5*	*F*	**140.5**	**F**	**+47.0**	**+0.067**
SR 237 EB Ramps	PM	17.3	C	18.9	C	+3.8	+0.027
Mathilda Avenue/	AM	*284.6*	*F*	**> 360**	**F**	**+170.5**	**+0.118**
SR 237 WB Ramps	PM	*> 360*	*F*	**> 360**	**F**	**> 360**	**+0.100**
Manila Drive (Moffett Park	AM	*> 360*	*F*	**> 360**	**F**	**> 360**	**+0.079**
Ext.)/Mathilda Avenue	PM	*339.3*	*F*	**> 360**	**F**	**+102.1**	**+0.075**
Central Expressway/	AM	*85.6*	*F*	**87.1**	**F**	**5.9**	**+0.012**
Mary Avenue	PM	48.6	E	56.4	E	+23.6	+0.076

Note: Unacceptable operations without the project are shown in italics, while significant impacts are highlighted in bold and highlighted text.

[1] Whole intersection weighted average stopped delay expressed in seconds per vehicle (sec/veh) for signalized intersections, and total control delay in sec/veh for unsignalized intersections.
[2] LOS calculations for signalized intersections performed using the 1985 *Highway Capacity Manual* methodology contained in the TRAFFIX software package with adjusted saturation flow rates to reflect local conditions.
[3] LOS calculations for unsignalized intersections performed using the 1997 *Highway Capacity Manual* methodology contained in the TRAFFIX software package.
[4] Change in average critical delay between Background and Project Conditions.
[5] Change in critical volume/capacity (V/C).

TABLE 4.3-9: **YEAR 2013 CUMULATIVE CONDITIONS WITH AND WITHOUT ALTERNATIVE 5**

Intersection	Peak Hour	Year 2013 Cumulative Without Alternative 5 Delay (sec)[1]	Year 2013 Cumulative Without Alternative 5 LOS[2]	Year 2013 Cumulative Plus Alternative 5 Delay (sec)	Year 2013 Cumulative Plus Alternative 5 LOS	Change in Delay[3]	Change in V/C[4]
Middlefield Road/	AM	*48.5*	*E*	48.5	E	+0.0	+0.000
Shoreline Boulevard	PM	*48.5*	*E*	48.7	E	+0.0	+0.000
Moffett Boulevard/	AM	48.0	E	50.4	E	+2.9	+0.016
Central Expressway	PM	53.4	E	58.9	E-	+5.5	+0.022
Moffett Boulevard/	AM	36.1	D	39.1	D-	+5.3	+0.029
Middlefield Road	PM	36.1	D	39.9	D-	+5.3	+0.032
Moffett Boulevard/	AM	11.3	B	12.5	B	+0.6	+0.043
SR 85 NB Ramp	PM	5.6	B+	6.0	B+	+0.0	+0.071
Moffett Boulevard/	AM	10.3	B	11.2	B	+1.8	+0.088
US 101 SB Ramps	PM	12.1	B	18.4	C	+12.9	+0.156
Moffett Boulevard/	AM	10.6	B	12.2	B	+3.7	+0.178
US 101 NB Ramps	PM	11.2	B	12.5	B	-4.0	+0.216
Moffett Blvd. (Clark Road)/	AM	*63.8*	*F*	**147.5**	**F**	**+83.6**	**+0.355**
R.T. Jones Road	PM	*196.6*	*F*	**382.4**	**F**	**+185.8**	**+0.619**
Whisman Road/	AM	13.6	B-	13.6	B-	0.0	+0.004
Middlefield Road	PM	15.1	C+	15.0	C+	0.0	+0.009
Ellis Street/	AM	21.6	C	23.6	C-	+2.9	+0.022
Middlefield Road	PM	17.2	C	18.5	C	+1.7	+0.040
Ellis Street/	AM	21.3	C	24.3	C-	+0.9	+0.013
US 101 SB Ramps	PM	16.8	C+	19.2	C	+2.9	+0.108
Ellis Street/	AM	18.2	C	18.3	C	+0.1	+0.010
US 101 NB Ramps	PM	11.8	B	12.2	B	-1.4	+0.005
Ellis Street/	AM	10.8	B	11.7	B	+0.9	+0.017
Manila Drive	PM	20.5	C	28.3	D	+7.8	+0.100
Middlefield Road/	AM	15.3	C+	15.4	C+	+0.2	+0.014
SR 237 WB Ramps	PM	19.4	C	20.6	C	+4.0	+0.033
Middlefield Road/	AM	19.3	C	19.3	C	+0.2	+0.005
SR 237 EB Ramps	PM	12.7	B	12.5	B	-0.1	+0.019
Manila Drive/	AM	7.1	B	7.2	B	+0.1	+0.004
H Street	PM	11.0	B	11.0	B	0.0	+0.003
Mathilda Avenue/	AM	*100.5*	*F*	101.7	F	+1.5	+0.002
SR 237 EB Ramps	PM	17.3	C	17.4	C	+0.1	+0.002
Mathilda Avenue/	AM	*284.6*	*F*	286.3	F	+2.3	+0.002
SR 237 WB Ramps	PM	*> 360*	*F*	> 360	F	+334.5	+0.000
Manila Drive (Moffett Park	AM	*> 360*	*F*	> 360	F	0.0	+0.000
Ext.)/Mathilda Avenue	PM	*339.3*	*F*	349.1	F	+11.5	+0.009
Central Expressway/	AM	*85.6*	*F*	85.6	F	+0.8	+0.002
Mary Avenue	PM	48.6	E	50.6	E	+6.5	+0.026

Note: Unacceptable operations without the project are shown in italics, while significant impacts are highlighted in bold and highlighted text.

[1] Whole intersection weighted average stopped delay expressed in seconds per vehicle (sec/veh) for signalized intersections, and total control delay in sec/veh for unsignalized intersections.
[2] LOS calculations for signalized intersections performed using the 1985 *Highway Capacity Manual* methodology contained in the TRAFFIX software package with adjusted saturation flow rates to reflect local conditions.
[3] LOS calculations for unsignalized intersections performed using the 1997 *Highway Capacity Manual* methodology contained in the TRAFFIX software package.
[4] Change in average critical delay between Background and Project Conditions.
[5] Change in critical volume/capacity (V/C).

TABLE 4.3-9A **YEAR 2013 CUMULATIVE CONDITIONS WITH AND WITHOUT THE MITIGATED ALTERNATIVE 5**

		Year 2013 Cumulative Without Alternative 5		Year 2013 Cumulative Plus Alternative 5 w/ Additional Housing		
Intersection	Peak Hour	Delay (sec)[1]	LOS[2]	Delay (sec)	LOS	Change in Delay[3]
Middlefield Road/	AM	*48.5*	*E*	48.5	E	+0.0
Shoreline Boulevard	PM	*48.5*	*E*	48.6	E	+0.0
Moffett Boulevard/	AM	48.0	E	49.1	E	+1.0
Central Expressway	PM	53.4	E	56.7	E-	+3.2
Moffett Boulevard/	AM	36.1	D	36.8	D	+1.0
Middlefield Road	PM	36.1	D	38.2	D-	+3.0
Moffett Boulevard/	AM	11.3	B	11.5	B	+0.2
SR 85 NB Ramp	PM	5.6	B+	5.9	B+	-0.1
Moffett Boulevard/	AM	10.3	B	10.5	B	+2.1
US 101 SB Ramps	PM	12.1	B	15.1	C+	+6.0
Moffett Boulevard/	AM	10.6	B	10.1	B	+1.5
US 101 NB Ramps	PM	11.2	B	11.7	B	-5.1
Moffett Blvd. (Clark	AM	*63.8*	*F*	**73.4**	**F**	**+9.5**
Road)/R.T. Jones Road	PM	*196.6*	*F*	**295.5**	**F**	**+99.1**
Whisman Road/	AM	13.6	B-	13.6	B-	-0.1
Middlefield Road	PM	15.1	C+	15.2	C+	-6.6
Ellis Street/	AM	21.6	C	22.0	C	+0.7
Middlefield Road	PM	17.2	C	17.8	C	+0.8
Ellis Street/	AM	21.3	C	23.4	C-	+1.2
US 101 SB Ramps	PM	16.8	C+	18.0	C	+1.4
Ellis Street/	AM	18.2	C	18.3	C	-0.1
US 101 NB Ramps	PM	11.8	B	12.1	B	+0.2
Ellis Street/	AM	10.8	B	10.9	B	+0.1
Manila Drive	PM	20.5	C	24.4	C	+4.0
Middlefield Road/	AM	15.3	C+	15.3	C+	-0.1
SR 237 WB Ramps	PM	19.4	C	19.9	C	+1.6
Middlefield Road/	AM	19.3	C	19.1	C	+0.0
SR 237 EB Ramps	PM	12.7	B	12.6	B	- 0.1
Manila Drive/	AM	7.1	B	7.1	B	0.0
H Street	PM	11.0	B	11.0	B	0.0
Mathilda Avenue/	AM	*100.5*	*F*	101.9	F	+1.5
SR 237 EB Ramps	PM	17.3	C	17.4	C	+0.0
Mathilda Avenue/	AM	*284.6*	*F*	283.6	F	-1.0
SR 237 WB Ramps	PM	*> 360*	*F*	> 360	F	+167.5
Manila Drive (Moffett Park	AM	*> 360*	*F*	> 360	F	0.0
Ext.)/Mathilda Avenue	PM	*339.3*	*F*	344.3	F	+5.7
Central Expressway/	AM	*67.2*	*F*	66.9	F	-0.3
Mary Avenue	PM	52.2	E	55.0	E	+7.8

Note: Unacceptable operations without the project are shown in italics, while significant impacts are highlighted in bold and highlighted text.

[1] Whole intersection weighted average stopped delay expressed in seconds per vehicle (sec/veh) for signalized intersections, and total control delay in sec/veh for unsignalized intersections.
[2] LOS calculations for signalized intersections performed using the 1985 *Highway Capacity Manual* methodology contained in the TRAFFIX software package with adjusted saturation flow rates to reflect local conditions.
[3] LOS calculations for unsignalized intersections performed using the 1997 *Highway Capacity Manual* methodology contained in the TRAFFIX software package.
[4] Change in average critical delay between Background and Project Conditions.
[5] Change in critical volume/capacity (V/C).

e. Estimated Intersection Queuing

The effect of project-generated traffic on vehicle queues under 2013 conditions can be estimated by comparing the total design queues from the baseline (i.e. the total number of vehicles regardless of the number of lanes) presented on the TRAFFIX LOS calculation worksheets. However, it is important to note that these estimates are based on substantial changes in traffic volumes over the next eleven years including trip estimates for numerous background projects. Since the green times for individual movements may change during the study time frame, maximum queue estimates may also vary from actual measured lengths under future conditions.

The impact of project traffic on left-turn vehicle queues was evaluated at five intersections serving CMP facilities. These locations were selected based on intersections where the project would add traffic to left-turn movements to and from CMP facilities. Estimated Year 2013 queues with and without the proposed project at each location under each alternative are presented in Table 4.3-10.

The proposed project may increase AM peak hour maximum queues by zero to four vehicles depending on the alternative as compared to Baseline Conditions without the project. Under 2013 PM peak hour conditions, the project is expected to increase queues under Baseline Conditions by zero to nine vehicles depending on the alternative, with the largest increases expected under Alternative 4. The only substantial increases in vehicle queues (i.e. more than one vehicle) under the Preferred Alternative (Alternative 5) are expected to occur in the westbound left-turn movements to southbound Highway 101 at Moffett Boulevard (three vehicle increase) and at Ellis Street (five vehicle increase).

The Moffett Boulevard interchange has yet to be reconstructed, and the north side of the Ellis Street interchange would be modified as part of development already approved under the CUP EA. In addition, the entire interchange may be modified to accommodate bicycle lanes. NASA will work with Caltrans and the appropriate local agencies to identify which, if any, interchange and

mainline improvements would be feasible to mitigate the traffic impacts caused by Alternatives 2 and 4 should either of these project alternatives be implemented.

f. Impacts on the Mathilda Avenue/Highway 237 Interchange

The Mathilda Avenue/Highway 237 interchange and the two adjacent intersections are closely spaced, operate on a single signal controller, and are fully coordinated. Thus, traffic from adjacent upstream and downstream intersections can effect operations at each location. However, the TRAFFIX analysis program used to calculate levels of service does not necessarily accurately represent conditions at this type of interchange because it analyzes intersections independently. The results in Tables 4.3-6 through 4.3-9 indicate that Alternatives 2 through 4 would substantially degrade operations at the Moffett Park Boulevard and Highway 237 westbound ramp intersections on Mathilda Avenue. In an attempt to better estimate future traffic operations, a CORSIM model was developed for the Mathilda Avenue/Highway 237 interchange including the adjacent intersections of Mathilda Avenue/Moffett Park Boulevard and Mathilda Avenue/Ross Drive. CORSIM is a software package developed by the Federal Highway Administration (FHA) that models an integrated network of roadways and/or freeway segments and ramps. The effects of vehicle queuing, merging traffic, and lane changes are just some the operational characteristics modeled by this software.

To be consistent with the TRAFFIX analysis, a model of year 2013 conditions was developed. Traffic signal timings provided by the City of Sunnyvale, in addition to lane configurations and turn pocket lengths, were used as inputs to the CORSIM model. Year 2013 traffic volumes without the proposed project were analyzed first to determine future baseline operations and calibrate the model for future conditions. Traffic volumes were obtained from the *1220 Mathilda Avenue Transportation Impact Analysis* (Draft Report 2, October 30, 2000) published by Meyer, Mohaddes Associates, Inc., and then adjusted to reflect additional traffic growth between 2002 (the horizon year for the Meyer, Mohaddes report) and 2013 (the proposed project's horizon year). The detailed results of the CORSIM model were summarized using a

TABLE 4.3-10 **YEAR 2013 VEHICLE QUEUES WITH AND WITHOUT PROPOSED PROJECT FOR KEY CMP INTERSECTIONS**

		AM Peak Hour		PM Peak Hour	
Left-turn Movement	Alternative	No Project	With Project	No Project	With Project
SB Central Expy to EB Moffett Blvd	2	19	21	13	14
	3	19	21	13	14
	4	19	22	13	15
	5	19	19	13	14
	Mit. 5	19	19	13	14
WB Moffett Blvd to SB Highway 101 On-ramp	2	5	8	13	18
	3	5	7	13	18
	4	5	9	13	22
	5	5	7	13	16
	Mit. 5	5	8	13	14
SB Highway 101 Off-ramp to EB Ellis St	2	10	12	10	11
	3	10	11	10	11
	4	10	12	10	12
	5	10	10	10	11
	Mit. 5	10	10	10	11
WB Ellis St to SB Highway 101 On-ramp	2	3	6	13	20
	3	3	6	13	22
	4	3	7	13	22
	5	3	6	13	18
	Mit. 5	3	7	13	16
SB Mathilda Ave to EB SR 237 On-ramp	2	9	10	15	17
	3	9	9	15	16
	4	9	10	15	18
	5	9	9	15	15
	Mit. 5	9	9	15	15
NB Mathilda Ave to WB Moffett Park Dr	2	35	35	30	30
	3	35	35	30	30
	4	35	36	30	30
	5	35	35	30	30
	Mit. 5	35	35	30	30

post-processor spreadsheet developed by Fehr & Peers Associates, and then used to calculate the LOS for all four intersections. The 2013 AM period was analyzed first since these volumes were substantially higher than the corresponding PM peak period volumes. A CORSIM model of existing conditions was not developed for calibration purposes because the extremely high projected increase in traffic volumes is expected to require a complete modification of the existing signal timing and phasing, even without the project.

The results of this analysis showed that according to the CORSIM model, the facilities were not able to serve all of the projected AM peak hour demand. The model was first analyzed using the minimum pedestrian times for each approach, which resulted in an overall cycle length of 134 seconds. Although pedestrian volumes in this area are relatively low, this would provide a more conservative analysis of traffic operations. Additional runs were completed assuming no pedestrian minimum times and a cycle length of 120 seconds. With either cycle length, the maximum AM peak hour volume that could be served was approximately 75 percent of projected demand, and the corresponding levels of service were not considered accurate. In summary, the existing peak period congestion and lengthy delays at this location are expected to worsen substantially; in addition, the interchange is projected to be over-saturated by 2013 regardless of project implementation unless additional capacity on SR 237 is provided or future traffic demand in the Moffet Park area of Sunnyvale is limited. Thus, the CORSIM analysis could not be used to accurately quantify project impacts at the Mathilda Avenue/SR 237 interchange.

g. Effect of Charleston Avenue Bridge

As noted in the Regulatory Setting section in Chapter 3.3, above, the City of Mountain View and the VTA have expressed interest in the construction of a new roadway connection between Shoreline Boulevard and Moffett Boulevard on the east side of Highway 101. The purpose of this connection would be to provide additional local circulation within and near the City of Mountain View and to provide additional parallel capacity to Highway 101.

The City of Mountain View Year 2010 travel demand model was used to estimate the shift in traffic volumes between Shoreline Boulevard, which serves the North Bayshore area, and Moffett Boulevard, which is the primary access to the Ames Campus. Land uses in the traffic analysis zone (TAZ) representing the existing Moffett/NASA areas (TAZ 125) were modified based on Alternative 4 uses and Alternative 5 (the preferred alternative). Uses were adjusted so that the number of new trips generated by the TAZ generally approximated the number of net new trips estimated using ITE rates. In addition, the highway network was modified to reflect the latest proposed configuration for the Highway 101/Highway 85 interchange. The model was run with this data, and AM and PM peak hour turning movement volumes were obtained at the Moffett Boulevard ramp intersections and at the Shoreline Boulevard/Charleston Road intersection.

The model was run a second time for each alternative with a new, two-lane roadway over Stevens Creek connecting R.T. Jones Road (the Moffett Boulevard Extension) and Charleston Road. The model estimated that the new bridge would serve a daily traffic volume of 11,000 and 8,500 vehicles per day for Alternatives 4 and 5, respectively. These volumes are well within the capacity of a two-lane roadway. Peak hour turning movement volumes were obtained for the intersections under both alternatives to determine the potential effect at intersections.

A review of the LOS calculations for all of the alternatives showed that operations at the Moffett Boulevard ramp intersections would not change substantially with construction of the bridge. Both intersections would operate at essentially the same levels and improvements would still be required at both locations to provide acceptable operations with the proposed project under both alternatives. Based on this impact analysis, it appears that the Charleston Road bridge would provide an alternate path for North Bayshore and Ames Campus traffic, but it is not required to mitigate impacts of the proposed project.

h. Effects on Freeways

Freeway analysis was conducted for both the highway segments close to the Ames Campus, and for those segments located further away or in adjacent counties that would likely serve some project-generated traffic. As noted under the Existing Freeway Analysis Methodology and Operations section (Chapter 3.3, Section C-1.f), some project-generated trips made by employees are expected on highway segments located a substantial distance from the Ames Campus, such as in San Mateo County, Alameda County, distant portions of Santa Clara County and other more distant, outlying counties. Trips made by university students, on-site residents, and museum visitors were assumed to be more local (i.e., mostly within Santa Clara County). As a result, not all project-generated trips were assigned to the furthest freeway segments.

Commuter trips, which represent approximately 40 to 50 percent of the total net new project vehicle trips depending on the peak hour, were distributed to the regional freeway system based on the projected residences of commuters to the Sunnyvale/Mountain View employment superdistrict published by the Metropolitan Transportation Commission (2000). As noted previously, the analysis of potential freeway impacts was identified by determining those segments to which the proposed project would add more than one percent of a segment's capacity. It is important to note that although some study segments operate at LOS D or better under existing conditions, increases in traffic from future regional growth will possibly degrade operations to LOS E or F. The analysis of nearby and external freeway segments for each alternative that includes new construction is summarized in the tables found in Traffic and Circulation Appendix B. A segment is defined as a two-way section of freeway.

The freeway analysis shows that the proposed project would likely significantly affect operations on all segments of Highways 85, 101 and 237 near the project site in at least one direction during the AM and/or PM peak hour. Regardless of the alternative, the proposed project would add traffic volumes that are at least one percent of capacity (and in some cases nearly

eight percent) on all nearby segments (see Tables B-1 through B-4 in Appendix B). Nearby segments were defined as freeway segments within approximately 1.6 kilometers (one mile) of the project site.

Project-generated commute traffic is expected to exceed one percent of the capacity on 16 of the 24 external study segments under Alternatives 2 and 3, 18 segments under Alternative 4, and nine (9) segments under Alternative 5. Overall, project traffic generally represents between 0.1 and 2.5 percent of freeway capacity for most external segments outside a 16-kilometer (10-mile) radius from the project site.

i. Construction Traffic Impacts

Development of the proposed project will require demolition of existing structures, transport of waste, earth, materials, and construction of new buildings and utilities. All of these activities will generate trips by construction vehicles and workers. The vehicles with the greatest impact on peak period traffic operations are trucks because of their slow acceleration, long deceleration, and wide turning radii. These characteristics can reduce the capacity of the adjacent streets if they constitute a significant proportion of traffic.

The construction activity that is expected to generate the highest number of truck trips is the filling of the Bay View area prior to construction of the residential units. The amount of earth needed is expected to generate 12,300 truck loads or 24,600 truck trips over a two- to three-year period. Based on 250 working days per year, this equates to an average of approximately 33 to 49 truck trips per day likely using the Highway 101/Moffett Field interchange. These trips will be distributed throughout the day and are not expected to significantly affect peak period intersection operations at the ramps or on-site.

Buildout of the proposed project is expected to take until 2013. With only approximately 350,000 square feet of building space under construction each year, the number of construction workers is expected to be limited. At any

one time, up to 100 workers are expected to travel to and from the project site during the peak period. This volume of traffic is not expected to significantly affect any of the study intersections, including the intersections of Moffett Boulevard-Clark Memorial Drive at R.T. Jones Road or Ellis Street at Manila Avenue. Based on the limited number of truck trips and construction worker vehicle trips during the peak periods, construction traffic impacts are expected to be less than significant.

2. Effects on Public Transit

The development of a substantial new employment and student base at the Ames Campus would increase the number of potential public transit riders in the study area. The purpose of the proposed aggressive TDM plan is to encourage as many people as possible to use alternatives to single-occupant vehicle trips.

As noted under existing conditions, the level of light rail, bus, and Caltrain shuttle ridership to and from the Ames Campus is high compared to the rest of Santa Clara County, but is relatively low given the capacity of each mode. Less than 300 daily trips are made using all of these modes. VTA light rail service is currently operated on 10-minute headways during the peak periods with trains that have a standing-room only capacity of 160 people per car. Bus service is typically adjusted to accommodate demand, and would be enhanced with increased ridership. Although current demand sometimes exceeds capacity (especially for bicyclists), Caltrain service is constantly being modified and expanded to handle increased demand. As part of the proposed project, the number of vehicles and frequency of the dedicated Caltrain shuttle service would be increased, and an on-site shuttle would include a stop at the light rail station. These services, in addition to provision of transit subsidies (e.g., EcoPass, Commuter Check), would encourage ridership by increasing convenience and reducing costs and travel times.

Although implementation of the project would not conflict with existing or planned public transit facilities and services, implementation of the NADP would generate additional public transit demand. According to the project

trip generation summary, the alternative with the highest level of TDM reduction is Alternative 4. The aggressive TDM program would be expected to provide a reduction of 712 inbound trips in the AM peak hour and 800 outbound trips in the PM peak hour. These trips would be distributed amongst Caltrain, VTA light rail, VTA buses, bicycle facilities, pedestrian facilities, and carpools/vanpools. Even if 50 percent of the PM peak hour trips or 400 trips were made using light rail, for example, this would equate to an average of 66 additional passengers per train, assuming 10-minute headways during peak hours. This load could be accommodated by the existing service or, in the worst-case, would require an additional vehicle. VTA Long-Range Planning staff has indicated that the Tasman West line is designed to accommodate up to three-car trains when ridership increases and an adequate supply of vehicles is available.[2]

Additional demand on buses could be accommodated by the existing service or may require an increase in the frequency of service. The proposed shuttle service to Caltrain will serve some of the TDM demand. Consistent with transportation studies for private development throughout Santa Clara County, the proposed project is being designed to accommodate bus vehicles including through the Town Center traffic circle feature. VTA buses could share proposed shuttle stops within the campus.

Thus, the increased public transit demand generated by the proposed project could be accommodated by the existing and proposed facilities and services, given the multiple public transit opportunities, the existing available capacity, and each transit agency's ability to modify service to accommodate changing demand.

3. Effects on the Bicycle Network

Bicycle travel to and from the Ames Campus using Moffett Boulevard, Ellis Street, and Mathilda Avenue is generally considered difficult because of the

[2] Jim Lightbody, VTA, October 2001.

volume and speed of traffic, potential conflict points (at Moffett Boulevard and Ellis Street), and the lack of designated bicycle lanes or paths. The planned improvements to the Moffett Boulevard/Highway 101 interchange will improve bicycle travel because the elimination of the direct and loop ramps and construction of signalized ramp intersections will require vehicles to reduce their travel speed, and will eliminate weaving sections (where vehicles merge and diverge over a short distance) that are more hazardous for bicycle travel. As part of the interchange upgrade, bicycle lanes will be provided across Highway 101 to the Moffett Boulevard-Clark Memorial Drive/R.T. Jones Road intersection.

The City of Sunnyvale's plan to construct pedestrian/bicycle bridges on Borregas Avenue over Highway 101 and SR 237 to the east, as well as bike lanes on Moffett Park Drive east of Mathilda Avenue, will improve bicycle access to the study area. These facilities will improve access across these freeways and provide an alternative to the congested Mathilda Avenue corridor for bicyclists.

No improvements have been identified for the Ellis Street underpass at the Highway 101 interchange, which creates hazardous conditions for bicycle travel. As currently configured, bicyclists must share travel lanes with vehicles next to large concrete bridge piers because of the adjacent light rail line and limited right-of-way. Implementation of the NADP, with its aggressive TDM plan, would increase the number of bicycle trips through the Ellis Street underpass, subjecting more riders to hazardous travel conditions. A similar conclusion can be reached regarding bicycle travel on Mathilda Avenue, but Ellis Street south of Highway 101 is generally more attractive to bicyclists because of lower traffic volumes; thus, fewer bicyclists would be expected to approach the site from Mathilda Avenue and Moffett Park Drive, which would typically be used by Eastside/Airfield employees only. Once the Borregas Avenue bridges are constructed, bicyclists approaching from the southeast will have another route option to access the site.

On-site bicycle facilities will be extensively improved in the NRP area with the provision of bicycle lanes and multi-use paths. In addition, most streets will be designed to minimize vehicle travel speeds, which enhances bicycle travel. Bicycle parking will be provided at key locations throughout the Research Park (i.e., employment centers) and in the residential developments in Bay View. Secure parking will be provided in addition to bicycle racks, which will be installed near retail and service centers.

4. Effects on Pedestrian Facilities

As noted above, the on-site pedestrian system at the Ames Campus would be improved substantially by the implementation of the NADP. Under all four project alternatives, an extensive network of sidewalks and paths would be constructed to improve safety and accommodate new demand. As part of the project, a new pedestrian path linking the NRP area to the existing Bayshore light rail station would also be constructed.

The number of pedestrians accessing the project site from west of Highway 101 is expected to be very limited because: 1) the existing land uses west of Highway 101 would not generate substantial walk trips to the Ames Campus, and 2) other modes such as light rail transit, bus transit, shuttle service and bicycling will offer better travel opportunities. As described above in relation to bicycle circulation, the reconfiguration of the Moffett Boulevard/Highway 101 interchange will improve pedestrian travel by eliminating the existing direct and loop ramps and constructing signalized ramp intersections. These intersections are expected to include pedestrian signals and activation buttons. Thus, the proposed project is not expected to negatively affect pedestrian travel across Highway 101.

C. Impacts and Mitigation Measures

This section summarizes significant impacts associated with traffic and circulation, and proposes mitigation measures for each identified impact.

Impact CIR-1: Implementation of the proposed project would increase vehicle trips and traffic congestion on segments of Highways 101, 85, and 237 in the immediate vicinity of the Ames Campus, as well as on highway segments outside the local study area. On all nearby segments projected to operate at LOS F, the project would add more than one percent of capacity in at least one direction during the AM and/or PM peak hour. The project is also expected to add more than one percent of capacity to numerous highway segments outside the immediate vicinity of the project in Santa Clara County, as well as on several segments in adjacent counties. Under the Mitigated Alternative 5, the number of segments would be reduced to three.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure CIR-1: As part of the NADP, NASA and its partners would implement an aggressive Transportation Demand Management (TDM) program designed to reduce trip generation by a total of at least 22 percent. AVR goals are set for each phase of the TDM plan. Development will not proceed to the next phase until the previous phase's goal has been met. In addition, on-site housing would also help to reduce vehicle trip generation to external streets and freeways by internalizing trips to on-site employment centers and amenities.

To completely mitigate the highway impacts of the proposed project under any of the development alternatives, each highway segment would have to be widened to provide an additional travel lane in at least one direction or other capacity improvements would have to be made. In many cases, widening is infeasible due to right-of-way constraints and the proximity of existing building structures and development. Immediately adjacent to the project site, for example, Highway 101 could not be widened because of the proximity of Manila Drive and the VTA light rail line. In addition, large-scale freeway widening projects are beyond the scope of a single project and could only garner a relatively small fair-share contribution towards the improvement. Therefore, despite the substantial trip reductions from implementation of the TDM program, the increase

in vehicle trips and congestion on the highway system associated with implementation of the NADP would be a significant, unavoidable impact. NASA will work with VTA and Caltrans to consider other mitigations.

Impact CIR-2: The proposed project would increase vehicle trips and traffic congestion at the Moffett Boulevard/Central Expressway and Ellis Street/Manila Drive intersections.

Applicable to: Alternative 2 through 4

Mitigation Measure CIR-2a: *Moffett Boulevard/Central Expressway*. The improvement required to mitigate this impact is the addition of a separate right turn lane from southbound Moffett Boulevard to westbound Central Expressway. This measure would require right-of-way acquisition to implement. The additional lane would improve operations to LOS E during the PM peak hour and would fully mitigate the impact.

Mitigation Measure CIR-2b: *Intersection of Ellis Street/Manila Drive.* Development under the NADP would include the following improvements to achieve acceptable operations and minimize queuing at this intersection:

- Install a traffic signal.
- Provide the following lane configurations:
  - *Northbound (from Highway 101)*: two through lanes and one right-turn lane.
  - *Southbound (from NRP)*: one left-turn lane and two through lanes.
  - *Westbound (from the LRT station)*: one left-turn lane and one shared left-turn/right-turn lane.

This measure would provide LOS C operations during the PM peak hour.

Impact CIR-3: The proposed project would increase vehicle trips and traffic congestion at the intersections of Moffett Boulevard-Clark Memorial Drive/ R.T. Jones Road.

Applicable to: Alternative 2 through 5, and Mitigated Alternative 5

Mitigation Measure CIR-3: *Intersection of Moffett Boulevard/Clark Memorial Drive/R.T. Jones Road.* Development under the NADP would include the following improvements to achieve acceptable operations and minimize queuing at this intersection:

- Installation of a traffic signal.
- Provision of the following lane configurations:
  - *Northbound (from Space Camp/base housing)*: one left-turn lane, one shared through/right-turn lane.
  - *Southbound (from Bay View)*: one left-turn lane, one through lane, and one "free" right-turn lane (i.e., the right-turn movement would not be controlled by the signal and would require a third westbound receiving lane on Moffett Boulevard).
  - *Westbound (from Clark Memorial Drive)*: one left-turn lane, two through lanes, and one right-turn lane.
  - *Eastbound (from Highway 101)*: two left-turn lanes, one through lane, and one shared through/right-turn lane.

This measure would provide LOS C or D operations or better during all periods under all alternatives.

Impact CIR-4: The proposed project would increase vehicle trips and traffic congestion at the following intersections:

Moffett Boulevard/Highway 101 SB ramps

Moffett Boulevard/Highway 101 NB ramps
Central Expressway/Mary Avenue.

Applicable to: Alternative 4

Mitigation Measure CIR-4a: *Moffett Boulevard/Highway 101 SB ramps*. Mitigation of this impact for Alternative 4 would require the addition of a second westbound left-turn lane to southbound Highway 101. The current plans for the interchange modification currently only include a single westbound left-turn lane. This improvement would provide LOS B operations during the PM peak hour. Because of cost, political, and ownership considerations, this mitigation measure is not feasible. Thus this impact would remain significant and unavoidable.

Mitigation Measure CIR-4b: *Moffett Boulevard/Highway 101 NB ramps*. Mitigation for Alternative 4 would require the addition of a second northbound right-turn lane on the off-ramp from U.S. 101. The current plans for the interchange modification currently only include a single northbound right-turn lane towards the project site. This improvement would provide LOS C operations during the AM peak hour. Because of cost, political, and ownership considerations, this mitigation measure is not feasible. Thus this impact would remain significant and unavoidable.

Mitigation Measure CIR-4c: *Central Expressway/Mary Avenue*. Mitigation for Alternative 4 would require the addition of a second southbound right-turn lane to westbound Central Expressway. This improvement would provide LOS E operations during the AM peak hour. However, adjacent existing development and a sidewalk would preclude widening of the roadway. Because of these right-of-way constraints, this mitigation measure is not considered feasible. Thus this impact would remain significant and unavoidable.

Impact CIR-5: Alternatives 2 and 4 would increase vehicle trips and traffic congestion at the following intersections:

Moffett Boulevard/Middlefield Road
SR 237 EB Ramps/Mathilda Avenue
SR 237 WB Ramps/Mathilda Avenue
Moffett Park Drive/Mathilda Avenue

Applicable to: Alternatives 2 through 4

Mitigation Measure CIR-5a: *Moffett Boulevard/Middlefield Road.* To fully mitigate the impacts under both the AM and PM peak hours at this location, a separate right-turn lane from Middlefield Road to northbound Moffett Boulevard would be required. In addition, an overlap signal phase concurrent with the left-turn phase for southbound Moffett Boulevard to eastbound Middlefield Road would be required.

These improvements would provide LOS D operations during both peak hours and would fully mitigate the projected impacts. However, a preliminary field review indicates that this improvement is not feasible due to the proximity of existing development and a sidewalk. Thus, the impact is expected to remain significant and unavoidable.

Mitigation Measure CIR-5b: *SR 237 EB Ramps/Mathilda Avenue*. The addition of any lane capacity at this location would require: complete re-construction of the Highway 101 overpass to widen the road for additional through lanes, non-standard lane configurations such as four left-turn lanes, or provision of another street crossing over SR 237 (e.g., the Mary Avenue overcrossing). Because of cost, political, and ownership considerations, this mitigation measure is not feasible. Thus this impact would remain significant and unavoidable.

Mitigation Measure CIR-5c: *SR 237 WB Ramps/Mathilda Avenue*. Mitigation of this impact would require the addition of a separate southbound right-turn lane from Mathilda Avenue to the on-ramp to westbound SR 237 to provide four exclusive southbound through lanes. Because of cost, political, and ownership considerations, this mitigation

measure is not feasible. Thus this impact would remain significant and unavoidable.

Mitigation Measure CIR-5d: *Moffett Park Drive/Mathilda Avenue.* Mitigation of this impact would require the addition of a second southbound right-turn lane from Moffett Park Drive to westbound Mathilda Avenue towards downtown Sunnyvale. This lane would be in addition to the existing right-turn lane from Moffett Park Drive to westbound Highway 237, but would likely require modification of this already short-radius curve. Because of cost, political, and ownership considerations, this mitigation measure is not feasible. Thus, this impact would remain significant and unavoidable.

Impact CIR-6: The increased level of vehicle and bicycle traffic through the Ellis Street underpass at Highway 101 resulting from the project would increase hazards for bicyclists, who share the standard travel lanes in this location.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure CIR-6: Development under the NADP would modify the Ellis Street underpass to better accommodate bicyclists.

One option would be to shift all of the vehicle travel lanes to the north by 4 to 5 meters (12 to 15 feet). Currently, two travel lanes are provided in each direction between three sets of concrete piers. By moving the westbound lane to the north side of the northernmost piers and shifting the other lanes accordingly, additional width could be provided to accommodate bicycle lanes. The northern abutment would have to be rebuilt with a retaining wall similar to the design that was implemented to accommodate the light rail tracks. If this option were implemented, bike lanes would be at least 1.5 meters (5 feet) wide, and adequate signage and lighting would be provided. Figure 4.3-6 illustrates this measure. The feasibility of this improvement would have to be evaluated by a

structural engineer and by Caltrans since the intersection configurations at the two adjacent ramp intersections would have to be modified.

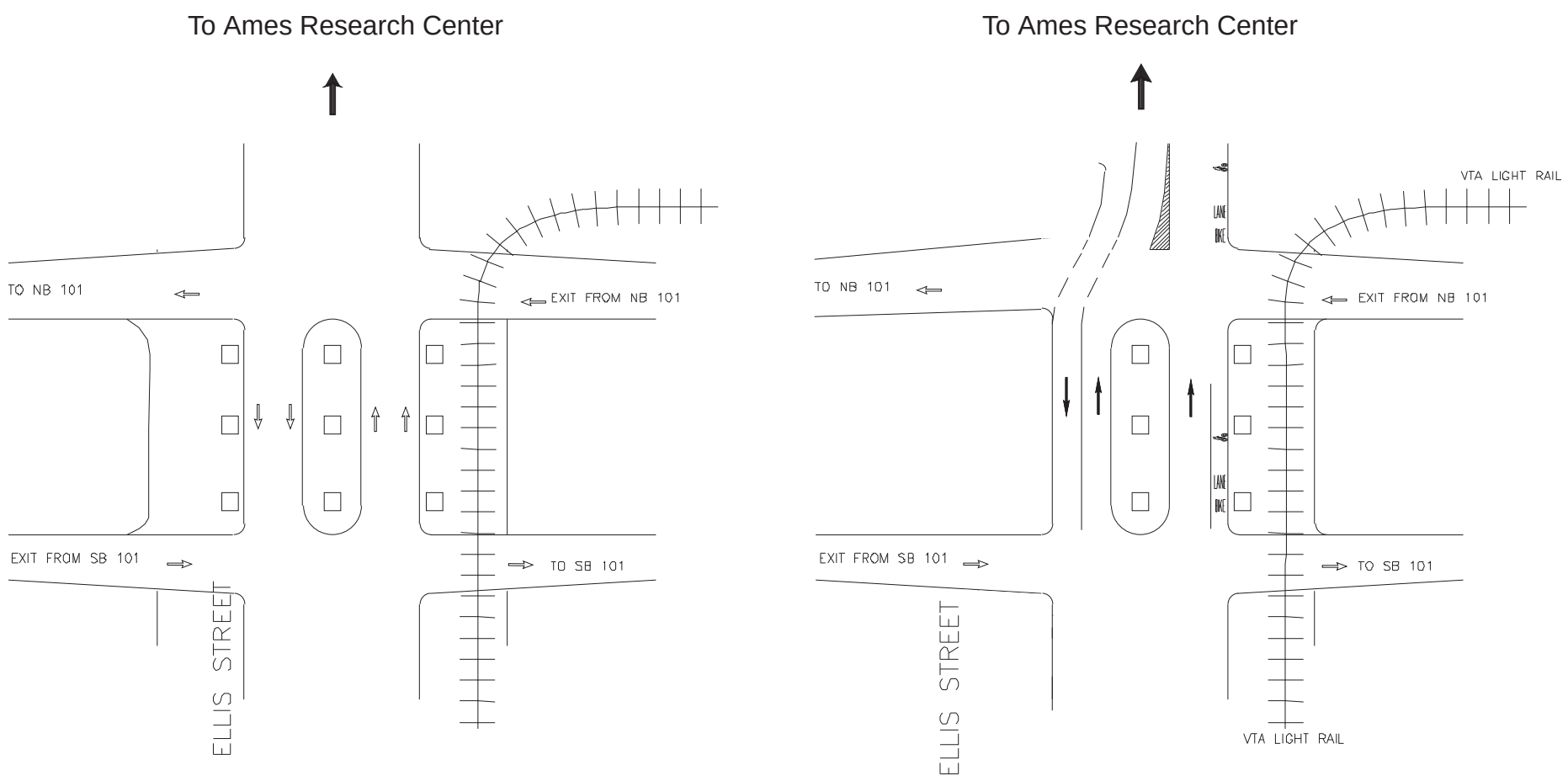
Another option would be modify the intersection to provide reversible 2.4-meter (8-foot) lanes that would allow for two lanes of car traffic and one lane of eastbound bike traffic in the morning and only one lane of car traffic and one lane for bikes in a westbound direction. In the afternoon/evening, the extra lane would provide westbound traffic flows. Again, adequate signage and lighting would be provided.

Implementation of this mitigation measure would reduce the potential impact on bicyclist safety to less-than-significant levels. If this improvement is determined to be infeasible and no alternative is found, then the impact would remain significant and unavoidable.

Impact CIR-7: Construction activity associated with the proposed improvements to facilities within Caltrans right-of-way has the potential to introduce pollutant laden runoff into the storm drain system.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure CIR-7: Improvements to facilities within Caltrans right-of-way associated with the development proposed under the NADP shall adhere to the conditions and requirements of Caltrans statewide NPDES Permit CAS #000003, Order #99-06-DWQ and NPDES General Permit CAS #000002, Order #99-08-DWQ, and shall incorporate Best Management Practices described in Section 4.4 of the Storm Water Management Plan which implements the statewide NPDES permit, as such requirements specifically apply to the proposed improvements. In general, this would include the preparation and implementation of a Storm Water Pollution Prevention Plan and Best Management Practices for construction and post-construction conditions for each such project.



Source: Fehr & Peers Associates, Inc.

FIGURE 4.3-6

POTENTIAL ELLIS STREET INTERCHANGE MODIFICATIONS

4.4 AIR QUALITY

A. Methodology

This section describes the methodologies used to forecast and evaluate potential air quality impacts from the proposed project.

1. Conformity Applicability Test Methodology

In response to the Clean Air Act (42 U.S.C. § 7401 *et seq.*) amendments enacted in 1990, the US EPA promulgated regulations (40 CFR Parts 51 and 93) requiring federal actions to conform to the State Implementation Plan (SIP), described in Section 3.4. Each state then established procedures for evaluating the conformity of federal actions with the applicable SIP. In 1994, the Association of Bay Area Governments prepared the Federal General Conformity Regulation for incorporation into the San Francisco Bay Area's portion of the SIP. Because the Bay Area's portion of the SIP only regulates emissions of ozone and carbon monoxide, the Federal General Conformity Regulation applies only to direct and indirect emissions of ozone precursor pollutants (i.e., reactive organic gases (ROG) and nitrogen oxides (NOx)) and carbon monoxide (CO). The Regulation sets *de minimus* levels of 91 metric tons (100 tons) per year for each ozone precursor pollutant and carbon monoxide. Thus if a federal action, such as the adoption of the NASA Ames Development Plan (NADP), would result in emissions under 91 metric tons per year (100 tons per year), no further analysis would be required. If a federal action exceeds the *de minimus* levels, however, the agency proposing it is required to make a SIP conformity determination, as described below.

To evaluate the conformity of the NADP with the Bay Area's portion of the SIP, both direct and indirect emissions from the proposed action have been calculated. Emissions were predicted for three source types: 1) construction, 2) operational mobile sources (i.e., project-generated traffic), and 3) area sources (e.g., natural gas combustion for space and water heating).

a. Construction Emissions

Annual emissions of carbon monoxide and ozone precursor pollutants from construction activities are calculated to evaluate the applicability of General Conformity requirements to the project. There is not yet a construction

schedule for implementation of the NADP, so the amount, type and duration of construction cannot be estimated. Instead, potential emissions from the construction of the proposed project must be calculated on the basis of project size.

General construction emission factors based on estimated development sizes are contained in the CEQA Air Quality Handbook that is published by the South Coast Air Quality Management District (SCAQMD CEQA Guidelines). Table 9-1 of the SCAQMD CEQA Guidelines lists screening level emission factors for estimating total construction emissions based on the type and size of the construction project. These factors account for all construction-related emissions, including diesel combustion from heavy-duty equipment, materials handling (i.e., truck traffic), and construction worker travel. When the screening emission factors for worker travel and materials handling are subtracted from the overall construction emission factors, it appears that emissions from heavy-duty construction equipment account for over 80 percent of the total construction period emissions of ROG, NOx and CO. Materials handling appears to account for 14 per cent of the construction period emissions, with worker travel generating only 6 per cent of the emissions. Screening emission factors from the SCAQMD CEQA Guidelines are shown in Table 4.4-1.

i. Emissions from Construction Equipment

When examined closely, the SCAQMD screening emission factors appear to have been developed from a number of sources that estimate emissions based on out-of-date methodologies and levels of emission control. Since 1987, controls have been adopted that substantially reduce emissions from heavy-duty compression ignited (or diesel) engines. In addition, EPA has recently developed the OFFROAD Model for estimating emissions from various off-road mobile sources, such as construction equipment. The California Air Resources Board (CARB) has modified the OFFROAD Model to reflect the effects of the new heavy-duty engine standards and reformulated diesel fuel. CARB has also recently updated the inventory of state-wide emissions to reflect

TABLE 4.4-1 **SCREENING FACTORS FOR ESTIMATING TOTAL CONSTRUCTION EMISSIONS**

	Total Emission Factors in Kilograms per 100m^2 (lbs per 1,000 ft^2) of Development		
Land Use Type	**ROG**	**CO**	**NOx**
Apartment/Housing	10.8 (22.0)	34.4 (70.2)	158.2 (322.9)
Hotel	20.4 (41.6)	65.1 (132.9)	299.4 (611.0)
Conference/Training	20.4 (41.6)	65.1 (132.9)	299.4 (611.0)
Museum/Exhibit Space	20.4 (41.6)	65.1 (132.9)	299.4 (611.0)
Office Park	27.1 (55.4)	86.8 (177.2)	399.2 (814.7)
Research & Development	27.1 (55.4)	86.8 (177.2)	399.2 (814.7)
Retail	15.6 (31.8)	49.8 (101.6)	228.8 (467.0)
University	23.0 (47.0)	73.6 (150.2)	338.3 (690.5)

Note: Table 9-3 indicates that material handling accounts for 14 percent of emissions.

Source: CEQA Air Quality Handbook, Table 9-1 (South Coast AQMD 1993).

the modified OFFROAD Model.[1] One of the refinements to the state emissions inventory was to update zero hour emission rates and include deterioration rates (increase in emission rates as equipment ages). These changes resulted in about an 8 percent increase to the overall off-road emission inventory for the baseline year (1990). Therefore, the heavy-duty construction equipment portion of the emission factors shown in Table 4.4-1 may be underestimated by 8 percent.

[1] *Notice of Public Meeting to Consider Approval of California's Emissions Inventory for Off-road Large Compression-ignited Engine (*$ *25 HP)*, California Air Resources Board.

The refined OFFROAD model was used by CARB to update emission inventories for future years. Based on CARB's inventory projections,[2] as shown in Tables 4.4-2 and 4.4-3, the unit emission rate for construction equipment is decreasing considerably. For example, unit NOx emissions in the year 2000 are only 67 percent of 1990 emissions, and they are forecasted to decrease to 42 percent in 2010. This substantial decrease resulting from cleaner burning engines and reformulated fuels is not accounted for in the SCAQMD CEQA Guidelines.

ii. Emissions from Construction-Generated Truck Trips

As described above, the SCAQMD CEQA Guidelines say that materials handling (mostly truck deliveries) accounts for about 14 per cent of total construction emissions. CARB predicts that heavy-duty truck emissions will decrease substantially in the future. The forecasted change was obtained from the EMFAC7F model for 1990 and the MVEI7G model for years 2005 through 2015. It is assumed that material handling emissions were estimated using an emission factor model similar to EMFAC7F. This model predicted 1990 heavy-duty truck emissions that are about 8 percent lower than the more recent EMFAC7G emission factor model. Similar to the OFFROAD model, the MVEI7G model forecasts substantial decreases in heavy-duty truck emissions in the future. For example, unit NOx emissions in the year 2000 are 61 percent of 1990 emissions. They are forecasted to decrease to 45 percent in 2010. These substantial reductions are not accounted for in the SCAQMD CEQA Guidelines.

iii. Adjusted Screening Emission Factors

Illingworth & Rodkin, the air quality experts on the consultant team preparing this EIS, corrected the screening emission factors published in the SCAQMD CEQA Guidelines to more accurately predict emission from construction activities based on the refined numbers described above. Corrections included an increase of 8 percent to the baseline emission factors. Emission factors for

[2] Personal communication with Debbie Futaba, California Air Resources Board Mobile Source Division, September 8, 2000.

TABLE 4.4-2 **CONSTRUCTION EQUIPMENT STATEWIDE EMISSION INVENTORY**

		Emissions in Metric Tons Per Day (Tons per Day) per Total Inventory			
Year	**Population**	**ROG**	**CO**	**NOx**	**PM_{10}**
1990	153,729	44.56 (49.12)	203.16 (223.94)	406.88 (448.50)	29.42 (32.43)
1995	161,089	39.74 (43.81)	165.85 (182.82)	353.76 (389.95)	24.30 (26.79)
2000	168,448	34.94 (38.51)	128.55 (141.70)	300.65 (331.41)	19.18 (21.14)
2005	180,482	29.87 (32.93)	109.08 (120.24)	267.80 (295.20)	17.67 (19.48)
2010	188,114	21.14 (23.30)	101.03 (111.37)	208.33 (229.64)	14.05 (15.49)
2015	193,493	15.35 (16.92)	96.88 (106.79)	154.08 (169.84)	10.90 (12.02)

future years were then adjusted by the factors shown in Table 4.4-4 . These factors take into account the benefits of reformulated diesel fuel, and the phase-in of newer cleaner heavy-duty diesel engines.

b. Mobile Sources

Emissions from mobile sources associated with operation of the proposed project were estimated using the MVEI7G model. This model was developed by CARB to calculate the mobile source inventory for the State. The BURDEN report for Santa Clara County, generated by the MVEI7G Model, was used to develop composite fleet emission rates. These rates were applied

TABLE 4.4-3 **CONSTRUCTION EQUIPMENT UNIT EMISSION RATES**

	Project Unit Emission Rate in Kilograms Per Day Based on Statewide Inventory			
Year	**ROG**	**CO**	**NOx**	**PM_{10}**
1990	0.29	1.32	2.65	0.19
1995	0.25	1.03	2.20	0.15
2000	0.21	0.76	1.78	0.11
2005	0.17	0.60	1.48	0.10
2010	0.11	0.54	1.11	0.07
2015	0.08	0.50	0.80	0.06

to the number of trips generated and forecasted vehicles miles traveled. Composite fleet emission rates were obtained for summer and winter seasons of the years 2005, 2010 and 2015.

Project trip generation data were developed by Fehr & Peers Associates, Inc. for weekdays, Saturdays, and Sundays. In a typical year, 65 percent of the trips were assumed for weekdays, 16 percent for Saturdays (including some holidays), and 19 percent were assumed for Sundays and major holidays.

The daily vehicle kilometers traveled was calculated by multiplying each trip by 11 kilometers (6.9 miles), which is the average trip length reported for Santa Clara.[3] Running exhaust and evaporative loss emissions (for ROG) were multiplied by the daily VMT. Start and trip end emissions, including "hot-

[3] Table 9, BAAQMD CEQA Guidelines 1996, revised 1999.

TABLE 4.4-4 **FACTORS TO ADJUST SCREENING CONSTRUCTION EMISSIONS FOR FUTURE YEARS**

	Adjustment Factors (Multipliers) to SCAQMD Construction Emission Factors			
Year	**ROG**	**CO**	**NOx**	**PM_{10}**
1990	1.08	1.08	1.08	1.08
1995	0.90	0.83	0.89	0.84
2000	0.72	0.59	0.72	0.60
2005	0.57	0.47	0.60	0.50
2010	0.40	0.43	0.46	0.39
2015	0.29	0.40	0.35	0.29

soak,"[4] were multiplied by the number of daily trips and calculated for both summer and winter conditions. The daily emission calculations were then converted to annual emissions, and are expressed in terms of metric tons per year.

Project trip generation data include the reductions from the proposed TDM program for Alternatives 2 through 5[5] as described in Chapter 2. These reductions take into account proposed on-site housing, the proximity of the project to light rail service, and shuttle service within the site and to Caltrain.

[4] Emissions produced by the heat of the engine after an automobile is turned off.

[5] Memo from Barb Laurenson of Nelson/Nygaard Consulting Associates to Sorhab Rashid of Fehr & Peers Associates on January 5, 2001.

c. Operational Area Sources

Emissions associated with typical area sources were calculated using the methods developed by the Sacramento Metropolitan Air Quality Management District (SMAQMD 1995). This method estimates emissions from natural gas combustion for space and water heating. Emissions from each type of land use were calculated on the basis of square footages using the SMAQMD factors.

2. PM_{10} Emissions During Construction

Generation of dust leads to emissions of PM_{10} during construction. The Bay Area Air Quality Management District (BAAQMD) guidance for evaluating construction-generated air quality impacts emphasizes implementation of effective and comprehensive control measures rather than detailed quantification of construction PM_{10} emissions. The significance of dust related emissions for this project is based on the implementation of mitigation measures to prevent dust clouds from impacting sensitive receptors such as residences.

3. Miscellaneous Sources

Potential stationary sources of air pollutant emissions identified at this time include laboratory uses and a disaster training facility. At this time, design details are not available for either of these uses, so air pollutant emissions cannot be quantified. Such sources may be required to obtain permits from the BAAQMD. Under the BAAQMD CEQA Guidelines, stationary sources of air pollution that obtain permits or are exempt from permitting are not expected to result in significant air quality impacts.

4. Local Carbon Monoxide Analysis

To assess local air quality impacts, carbon monoxide (CO) concentrations were modeled at congested intersections substantially affected by the project. Total emission calculations indicate that project-related emissions of CO will exceed the General Conformity *de minimus* level of 91 metric tons per year (100 tons per year). Therefore, a conformity determination would be needed to address the potential for CO concentrations that violate the National Ambient Air

Quality Standards (NAAQS). This conformity determination is included in Appendix D.

Hot spot CO screening modeling was conducted for eight of the most congested intersections that would be affected by traffic from the proposed project. The screening procedure was based on the methodology recommended by the BAAQMD.[6]

At the Moffet Boulevard/R.T. Jones Road intersection, a more detailed study was warranted by the results of the screening and was therefore conducted. This refined modeling analysis used the CALINE4 model following the Transportation Project-Level Carbon Monoxide Protocol.[7] This protocol includes two screening level methods and a refined level of analysis.

In both the screening and the detailed analysis, the CALINE4 model was used to predict 8-hour CO concentrations for comparison to the NAAQS of 9 parts per million (ppm) and the CAAQS of 9.0 ppm. Emission factors were developed with the EMFAC7Fv1.1 model, using the vehicle mix representative of Santa Clara County traffic and wintertime operating conditions. Although this model has been updated, EPA and CARB still require use of EMFAC7v1.1 as part of the CO dispersion modeling for conformity determinations. Inputs to the CALINE4 model included meteorological conditions representative of worst-case conditions (wind speed of 1 meter per second, worst-case wind angle search, sigma theta of 10E, mixing height 1,000 meters, and atmospheric stability of category F). Traffic conditions (either peak-am or peak-pm) for the busiest hour were used. The model predicts a one-hour level that was converted to an 8-hour level using a persistence factor of 0.7. Background 8-hour concentrations were determined using 8-hour CO background concentrations reported in Figure 4 of the BAAQMD CEQA Guidelines. These concentrations were adjusted for future years using the rollback factors

[6] BAAQMD *CEQA Guidlines*, 1996, revised 1999, pp. 36-46.

[7] University of California, Davis, 1997. *Transportation Project-Level Carbon Monoxide Protocol*. Institute of Transportation Studies. December.

contained in Table 13 of the CEQA Guidelines. Use of this method indicates background CO levels of 5.3 ppm in the year 2000 and 4.1 ppm for the year 2010 and beyond.

The total predicted 8-hour concentration was calculated by adding the modeled 8-hour CO level to the appropriate background 8-hour levels. Predicted concentrations are compared to the 8-hour CO NAAQS of 9 pm (or 9.4 ppm) to determine if the project conforms to the SIP. A predicted 8-hour CO concentration caused by the project that exceeded the California Ambient Air Quality Standard of 9.0 ppm would be considered a significant impact.

B. Standards of Significance

Project impacts would be considered significant if they would:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation. *A significant impact to local air quality is defined in this EIS as increased carbon monoxide concentrations at the closest sensitive receptors that cause a violation of the most stringent ambient standard for carbon monoxide (20 ppm for the one-hour averaging period, 9.0 ppm for the eight-hour averaging period).*
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). *A significant impact on regional air quality is defined in this analysis as an increase in emissions of an ozone precursor or PM_{10} exceeding the BAAQMD recommended thresholds of significance. The latest guidelines issued by the BAAQMD for the evaluation of project air quality impacts consider emission increases to be significant if they exceed 36 kilograms per day (80 pounds per day or 15 tons/year) for ozone precursors or PM_{10}. Any proposed project that would*

individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact.

- Expose sensitive receptors to substantial pollutant concentrations.
- Expose the General Public to significant levels of toxic air contaminants, defined as follows: 1) the probability of contracting cancer for the Maximally Exposed Individual (MEI) exceeds 10 in one million or 2) ground-level concentrations of non-carcinogenic toxic air contaminants would result in a hazard Index greater than 1 for the MEI.
- Create objectionable odors affecting a substantial number of people.

C. Impact Discussion

This section discusses potential air quality impacts that could be generated by the proposed project.

1. Regional Air Quality Planning

Air quality planning in the Bay Area is conducted to address both the Federal Clean Air Act and the State Clean Air Act. As described in Section 3.4, the State Implementation Plan (SIP) addresses the federally-enforceable Clean Air Act, and the Bay Area Clean Air Plan addresses the California Clean Air Act.

a. Conformity with the State Implementation Plan

Section 176(c) of the Clean Air Act Amendments requires Federal agencies to ensure that their actions conform to applicable plans for achieving and maintaining the National Ambient Air Quality Standards. The primary oversight responsibility for assuring conformity is assigned to the Federal agency.

NASA has calculated the annual emissions associated with the build out and operations of the NASA Ames Development Plan to evaluate the need for a conformity analysis. Emissions calculated included direct emissions from any new stationary sources, traffic generated by the project, area source emissions

such as natural gas usage for space and water heating, and construction emissions. As noted in Chapter 2, NASA envisions a 10-year build-out period, beginning about 2003. During the build out phase, emissions would vary year to year depending on the amount of construction conducted and the rate of occupancy. Emissions associated with build out over a 10-year period are shown in Table 4.4-5. Calculations used to develop these emissions are contained in Technical Appendix D.

Calculations indicate that project-related emissions would exceed *de minimus* levels of carbon monoxide for Alternatives 2 through 5 under 10-year build out plans. Thus implementation of any of Alternatives 2 through 5 would require a SIP conformity determination for carbon monoxide.

As also shown in Table 4.4-5, emissions of nitrogen oxides or reactive organic gases would not exceed *de minimus* levels under Alternative 5, assuming it is constructed in a uniform manner over the 10-year period. However, generation of ozone precursors would be expected to exceed *de minimus* levels under Alternative 5 if the construction schedule were accelerated, and this would constitute a significant impact. Moreover, Alternatives 2, 3 and 4 would also require a conformity determination for ozone, since NO_x (an ozone precursor) emissions are predicted to exceed *de minimus* levels for those alternatives if constructed over a 10-year period.

Given that NASA's preferred alternative for the NADP is Mitigated Alternative 5 and that Mitigated Alternative 5 requires a conformity determination for carbon monoxide (but not for other pollutants), NASA has drafted a conformity determination, which is included in Appendix D. The conformity determination includes the following findings:

1. The Proposed Action is the build out of Mitigated Alternative 5 described in this Final EIS for the NASA Ames Development Plan.

TABLE 4.4-5 **MAXIMUM ANNUAL EMISSIONS ASSOCIATED WITH BUILD OUT OF THE NADP ALTERNATIVES**

	Maximum Annual Construction and Operational Emission in Metric Tons Per Year (in tons per year)*		
	10-Year Build out		
Description	**ROG**	**NOx**	**CO**
Alternative 1	Baseline Conditions		
Alternative 2	17 (19)	112 (123)	**363 (399)**
Alternative 3	14 (15)	95 (104)	**322 (354)**
Alternative 4	21 (23)	136 (149)	**439 (482)**
Alternative 5	13 (15)	83 (91)	**287 (315)**
Mitigated Alternative 5	17 (19)	99(109)	**380 (417)**
Mitigated Alternative 5 (11-Year Buildout)**	15(17)	91(100)	**356(390)**
de minimus levels	*91 (100)*	*91 (100)*	*91 (100)*

* Emissions calculated for Alternatives 2 through 5 do not include baseline emissions (i.e., Alternative 1).

** For detailed discussion of Mitigated Alternative 5, see Section 5.4.

2. The Proposed Action is located in the Bay Area Air Quality Management District (BAAQMD), which is designated by the EPA as a maintenance area for the national carbon monoxide standard.

3. The Proposed Action, built out over a period of 11 or more years, would result in maximum annual total direct and indirect emissions of carbon

monoxide that exceed 100 tons per year. These emissions exceed the de minimus amounts specified in the General Conformity Rule (40 CFR 51), thus requiring a conformity determination.

4. The air quality analysis described in Part D2 of Appendix D, conducted for the Proposed Action, indicates that predicted carbon monoxide concentrations associated with the project would not cause or contribute to any new violation of the National Ambient Air Quality Standard (NAAQS) for carbon monoxide or increase the frequency or severity of any existing violation of the carbon monoxide NAAQS. Results of the CO dispersion modeling are included in Table 4.4-9.

5. Pursuant to Section 176(c) of the Clean Air Act (42 U.S.C. 7476(c)), NASA has determined that implementation of the Proposed Action (Alternative 5) will conform to the Bay Area Air Quality Management District (BAAQMD) State Implementation Plan for Carbon Monoxide. The applicable state implementation plan for carbon monoxide is the Bay Area Redesignation Request and Maintenance Plan for the National Carbon Monoxide Standard, approved by the EPA on June 1, 1998.

b. Consistency with the 2000 Bay Area Clean Air Plan

Project consistency with the Bay Area Clean Air Plan is evaluated in two ways:

- Population, employment and increases in vehicle miles traveled are compared to the ABAG projections used to develop the Clean Air Plan.
- Proposed measures to reduce emissions from traffic are compared to the applicable Transportation Control Measures contained in the 2000 Clean Air Plan.

The 2000 Clean Air Plan uses population and employment projections contained in ABAG's Projections 1999.

Future population and employment resulting from build out of Alternatives 2 through 5, shown in Table 4.4-6, would consume a large percentage of the assumed employment growth for both Mountain View and Sunnyvale. This would likely lead to greater growth than projections used to develop the 2000

TABLE 4.4-6 **RESIDENTIAL POPULATION AND EMPLOYMENT PROJECTIONS COMPARISON**

	Projected Increase 2000-2015	
Study Area	**Employment**	**Residential Population**
Alternative 1	Baseline	Baseline
Alternative 2	13,068	2,009
Alternative 3	11,047	1,266
Alternative 4	15,599	2,577
Alternative 5	7,222	2,808
Mitigated Alternative 5	*7,088*	*4,909*
*Mountain View**	*9,680*	*11,300*
*Sunnyvale**	*15,710*	*15,800*

* Includes sphere of influence.
Note: Mountain View and Sunnyvale data for 2015 are based on ABAG projections.

Bay Area Clean Air Plan indicate. Projects or plans that result in higher population and employment projections than those developed by ABAG could lead to inaccuracies in attainment planning efforts. As a result, the project may interfere with BAAQMD, MTC and ABAG planning efforts to attain the State ozone standard. Alternative 1 represents baseline conditions, which are assumed in future projections made by ABAG.

The 2000 Clean Air Plan includes measures to reduce transportation-related emissions, which are referred to as transportation control measures or TCMs. The plan relies on many different agencies, cities and counties to successfully implement these measures. NASA's Transportation Demand Management

TABLE 4.4-7 **TRANSPORTATION CONTROL MEASURE OF BAAQMD AND NRP/BAY VIEW TDM POLICIES AND ACTIONS**

Clean Air Plan Transportation Control Measure	Clean Air Plan Description of Relevant Implementing Measures	NRP/Bay View Transportation Demand Management Action
#1 Support Voluntary Employer-Based Trip Reduction Programs	" Provide assistance to local and regional ridesharing organizations	" 4.1.10: On-site Car-share Program " 4.1.12: Vanpool Program " 4.1.13: Site-wide EcoPass, or other public transit subsidy " 4.1.14: Guaranteed Ride Home Program " 4.1.15: Marketing and Information of transportation alternatives " 5.2: Parking Supply (at least additional 20% reduction in parking from required standards)
#9 Improve Bicycle Access	" Improve and expand bicycle lane system " Develop and implement comprehensive bicycle plans " Provide bicycle access to facilities	" 4.1.7: Bicycle Path/Lane Network " 4.1.8: Bicycle Parking (rack and secure) " 4.1.9: Bicycle Promotional Programs " 4.1.11: On-site Bicycle Fleet " 4.2.1, 4.2.2, 4.2.3: Required Partner/Tenant Bicycle Conveniences
#12 Improve Arterial Traffic Management	" Improve arterials for bus operations and encourage bicycle and pedestrian use " Improve signal timing	" 3.3: The NRP Transportation Management Agency " 4.1.1: Shuttle Program " 4.1.16: Improved VTA Bus Service
#15 Local Plans, Policies and Programs	" Incorporate air quality beneficial policies and programs into planning and development activities	" 2.3: Minimize Traffic and Air Quality Impacts " 3.2: Project Phasing (TDM program will start at beginning of project) " 4.1.2: Preferential Parking for Carpools and Vanpools " 5.3: Parking Phasing " 5.2: Parking Supply (at least additional 20% reduction in parking)
#17 Conduct Demonstration Projects	" Promote demonstration projects to reduce motor vehicle emissions (e.g. low-emission vehicle fleets and fueling stations)	" 4.2.6: Electric Carts/Bikes Requirements for Service Fleets " 5.2 Parking Supply (at least additional 20% reduction in parking)

Clean Air Plan Transportation Control Measure	Clean Air Plan Description of Relevant Implementing Measures	NRP/Bay View Transportation Demand Management Action
#19 Pedestrian Travel	" Include policies to promote pedestrian travel " Promote development patterns that encourage walking " Include pedestrian capital improvement programs	" 4.1.3 On-site Housing " 4.1.4 On-site Retail and Open Space " 4.1.6: Pedestrian Path Network " 4.1.13: Site-wide EcoPass, or other public transit subsidy " 4.2.1, 4.2.2, 4.2.3: Required Partner/Tenant Pedestrian Friendly Orientation (site-wide networks, showers)
#20 Promote Traffic Calming Measures	" Include traffic calming strategies in capital improvements	" 2.2 Campus Urban Design Vision (roadway segments a maximum of two land width) " 4.1.6: Pedestrian Path Network " 4.1.7: Bicycle Path/Lane Network

Sources: 1997 Bay Area Clean Air Plan (updated in 2000) and NASA Research Park Draft TDM Plan, dated April 2001

Plan will considerably reduce trips. Table 4.4-7 identifies TCMs that the BAAQMD recommends for implementation by local jurisdictions, along with the corresponding measures contained in the draft TDM plan. As shown in Table 4.4-7 , the TDM plan incorporated into the NASA Ames Development Plan would be consistent with transportation control measures contained in the 2000 Bay Area Clean Air Plan.

2. Regional Air Pollutant Emissions

Regional air pollutant emissions associated with project operations include new stationary sources, changes in the use of motor vehicles (i.e., project-related traffic increases) and new area sources (i.e., emissions from space and water heating) associated with the NASA Ames Development Plan. The NADP is not expected to result in increases to aircraft operations at the airfield, so there would be no changes to aircraft air pollutant emissions.

The key regional air pollutants analyzed in this EIS are ozone precursors and small particulate matter (PM_{10}). Emissions of these air pollutants were predicted for two different years, with the following assumptions:

- 2010: Approximately 75 percent buildout.
- 2015: 100 percent buildout.

Calculations used to develop these emissions are contained in Technical Appendix D. As shown in Table 4.4-8 , vehicle and area source air pollutant emissions of NOx and PM_{10} associated with Alternatives 2 through 5 would exceed the significance thresholds established by the BAAQMD for at least one of these pollutants.

Alternative 4 would result in the highest emission levels, while Alternative 5 (the Preferred Alternative) would result in the lowest levels.

3. Carbon Monoxide Concentrations

Carbon monoxide modeling is recommended under the BAAQMD CEQA Guidelines for projects or plans that generate over 250 kilograms or 550 pounds

TABLE 4.4-8 **AIR POLLUTANT EMISSIONS ASSOCIATED WITH PROJECT OPERATION**

Air Pollutant Emissions in Kilograms per Day *(pounds per day)*

Project Alternative	2010 (~75% Build out)			2015 (~100% Build out)		
	ROG	NO_x	PM_{10}	ROG	NO_x	PM_{10}
Alternative 1	Baseline Conditions			Baseline Conditions		
Alternative 2	39 (86)	114 (253)	49 (108)	35 (77)	135 (299)	65 (144)
Alternative 3	28 (63)	85 (189)	36 (79)	26 (57)	101 (224)	47 (105)
Alternative 4	48 (107)	138 (307)	60 (133)	43 (96)	163 (363)	80 (177)
Alternative 5	28 (62)	87 (193)	34 (76)	25 (56)	104 (230)	47 (101)
Mitigated Alternative 5*	37 (82)	113(250)	46(102)	38(85)	135(299)	62 (137)
BAAQMD Thresholds	36 (80)	36 (80)	36 (80)	36 (80)	36 (80)	29.8 (80)

* For details, see Section 5.4

per day and affect traffic at intersections. Furthermore, lead federal agencies under the General Conformity Rules (40 CFR Parts 51 and 93) must make a SIP conformity determination for carbon monoxide when project emissions are predicted to exceed 91 metric tons per year (100 tons per year). The SIP Conformity Determination includes an analysis that indicates whether or not the project would cause or contribute to a violation of the National Ambient Air Quality Standard for carbon monoxide. Since project-generated traffic would result in large quantities of carbon monoxide (i.e., over 250 kilograms per day or 91 metric tons per year), and would affect congested or potentially-congested intersections, carbon monoxide concentrations were modeled. The modeled concentration was added to background levels to predict total future concentrations. This prediction method assumes worst-case meteorological conditions during winter when carbon monoxide levels are highest (i.e., very

light winds, cold temperatures and stable atmospheric conditions). Predicted concentrations, shown in Table 4.4-9, were compared to State and federal standards. Since the 8-hour carbon monoxide standard is the most stringent, that standard was used to evaluate the significance of changes to carbon monoxide levels. The analysis was based on unmitigated traffic conditions.

Carbon monoxide concentrations are typically highest in the evening periods, especially near large sources of automobile trips. This is due to a combination of factors that include higher traffic volumes, meteorological conditions, and emissions from traffic combining with wood smoke. In addition, a higher percentage of commuter vehicles near NASA are in what is referred to as "cold-start" mode where carbon monoxide emissions are considerably higher. After these vehicles have been operating for a few minutes, carbon monoxide emissions decrease. Carbon monoxide emissions are higher during cold-start mode, since cold fuel is not efficiently combusted and catalytic converters in the exhaust line must heat up to reduce emissions effectively.

Carbon monoxide levels at many of the off-site intersections in the area would not change much due to the project. Results of the model indicate that carbon monoxide concentrations would remain below State and federal standards for all alternatives. Under Alternative 4, carbon monoxide concentrations near the intersections of Moffett-Clark and the Moffett Extension would be the highest. Concentrations were modeled to be 8.6 parts per million in the PM period under worst-case meteorological conditions. Violations of either federal or state standards for local carbon monoxide concentrations are not predicted under any of the project alternatives; therefore, the impact would be less than significant under those alternatives. The project would conform to the San Francisco Bay Area Maintenance Plan for the National Carbon Monoxide Standard (the approved SIP, BAAQMD 1994) since violations of the carbon monoxide ambient air quality standards are not predicted.

TABLE 4.4-9 **WORST-CASE PREDICTED CARBON MONOXIDE CONCENTRATIONS (PARTS PER MILLION)**

	Alt 1		Alt 2		Alt 3		Alt 4		Alt 5	
Intersection	1-Hr.	8-Hr.	1-Hr.	8-Hr.	1-Hr.	8-Hr.	1-Hr.	8-Hr.	1-Hr.	8-Hr.
Middlefield and Shoreline	13	8.3	13	8.3	13	8.3	13	8.3	13	8.3
Moffett and Central Expwy.	12	7.3	12	7.4	12	7.4	12	7.4	12	7.3
Moffett and Middlefield	12	7.4	12	7.7	12	7.7	12	7.8	12	7.6
Moffett-Clark and R.T. Jones Rd	10	6.2	12	7.6	12	7.9	13	8.6	12	7.4
Ellis and Middlefield	13	8.0	13	8.3	13	8.4	13	8.4	13	8.2
Ellis and Manilla	9	5.4	10	6.1	10	6.1	10	6.2	9	5.7
SR-237 WB ramps and Mathilda	13	8.4	13	8.6	13	8.6	14	8.7	13	8.4
Manilla-Moffett Park and Mathilda	13	8.3	13	8.5	13	8.4	13	8.5	13	8.3

State 1-hour standard is 20 ppm and federal 1-hour standard is 35 ppm.
State 8-hour standard is 9.0 ppm and federal 8-hour standard is 9 pm.
Note: Results do not include effects of traffic mitigation measures.

4. Toxic Emissions

This section describes potential toxic emissions from laboratory facilities constructed under the NADP and from the Regional Plume, described in Section 3.7, above.

a. Laboratories

The NADP would include new laboratory facilities. Small amounts of gasses considered toxic or hazardous may be used within these facilities, but specific types and quantities cannot be identified at this time. Storage of toxic gases is regulated by the Santa Clara County Health Department. The BAAQMD regulates emissions of toxic air contaminants and has determined that sources of these emissions that comply with all applicable regulations will generally not be considered to have an adverse significant impact to air quality. The BAAQMD reviewed health risk assessments prepared for university and commercial laboratories and found that teaching and commercial laboratories smaller than 2,300 square meters (25,000 square feet) in floor size with fewer than 50 fume hoods do not present an adverse significant health risk to the public, provided that responsible laboratory management practices are in place. As a result, the BAAQMD exempts these types of emissions from their permitting requirements (Regulation 2, Rule 1, Section 2.11 and Section 2.12). At this point, laboratories greater than 2,323 square meters (25,000 square feet) in size have not been identified under any of the alternatives, so significant toxic air contaminant emissions are not anticipated under the NADP. If larger labs are planned in the future, they would be subject to BAAQMD permit requirements and possible controls to ensure insignificant emissions.

b. Regional Plume

A Regional Plume of contaminated groundwater underlies a portion of Ames Research Center. The contamination was caused mostly by the semiconductor manufacturing and metal finishing activities of facilities across Highway 101. The Regional Plume also contains contaminants from past operations at the former Naval Air Station and NASA. The Regional Plume includes various chemicals, particularly chlorinated solvents (refer to Figure 3.7-1 in Section 3.7, Hazardous Materials and Site Contamination).

From 1999 to 2001, indoor air testing was conducted at many NASA buildings due to concern that buildings situated over the Regional Plume in the NRP area could be exposed to elevated levels of these contaminants.[8] The primary concern was that vapor-phase contaminants associated with the Plume could migrate through the soils into buildings. NASA requested measurements of volatile organic air contaminants in Hangar 1 and Buildings 6, 21, 22, 26, 111, 148, 156 and N-269 using EPA Sampling and Analysis Method TO-14. This method is used to measure very low levels of toxic contaminants in air. It involves the collection of air samples in specially designed canisters and subsequent analysis using gas chromatography/mass spectrometry with selective ion monitoring techniques.

Target compounds were identified through the results of groundwater testing. Each air sample collected was analyzed for 26 different volatile organic compounds, which included trichloroethylene, benzene, chloromethane, 1,2-dichloroethane, and vinyl chloride. A summary of the initial testing results is shown in Table 4.4-10. The testing results were compared against acceptable workplace standards, adjusted EPA Region 9 Preliminary Remediation Goal (adjusted for 24-hour per day exposure over 20 years), and EPA countywide average ambient air quality data. All measurements, including ambient air, found benzene concentrations above EPA preliminary remediation goals but well below OSHA's permissible exposure levels (PEL). These benzene concentrations were similar to concentrations measured by the BAAQMD in Mountain View and are considered to be characteristic of ambient air in the region. Motor vehicles are a major source of benzene emissions in the Bay Area. Concentrations of up to six different chlorinated hydrocarbons were detected above adjusted preliminary remediation goals (PRG) at five of the nine buildings tested. One other volatile organic compound, 1,4-dioxane, was detected above the PRG in all buildings that were tested except Building 111.

[8] NASA Ames Research Center. *Indoor Air Testing Report for Hangar 1 and Buildings 6, 21, 22, 26, 111, 148, 156 and N-269,* January 2000. Prepared by Science Applications International Corporation.

TABLE 4.4-10 SUMMARY OF VOC CONCENTRATION (IN PPBV) MEASURED DURING INDOOR AND AMBIENT AIR TESTING PROGRAM

VOC Analyte	Buildings																	Reference Values		
	Hanger 1	Bldg. 6	Bldg. 21	Bldg. 22	Bldg. 26	Bldg. 111	Bldg. 148	Bldg. 156	Bldg. N-269	Bldg. 555	Bldg. 583C	Bldg. 15	Bldg. 2	Bldg. 566	Bldg. 543	Bldg. 476	Ambient Samples	OSHA PEL	EPA PRG	EPA CEP
Trichloroethylene	**n.d.-1.0**	**0.08-1.1**	0.13-0.47	0.052	n.d.	n.d.-0.041	**n.d.-1.5**	**n.d.-0.84**	n.d.	0.08-0.10	n.d.	0.08-0.10	0.09-0.14	**n.d.-1.8**	n.d.	n.d.	n.d.	25,000	0.72	0.23
Perchloroethylene	0.48	0.069-0.27	0.06-0.07	0.098	0.13-0.34	0.48	0.052-0.07	0.07-0.23	0.045-0.07	n.d.-0.10	n.d.-0.11	0.30-0.43	0.13-1.1	n.d.-0.72	n.d.	n.d.-0.15	0.05	25,000	1.70	0.13
cis-1,2-Dichloroethene	n.d.-6.7	0.12-2.9	0.1-0.43	0.083	n.d.	n.d.-0.075	n.d.-0.27	n.d.-0.31	n.d.-0.22	n.d.-0.21	n.d.	n.d.-0.12	n.d.-0.09	n.d.	n.d.	n.d.	n.d.-0.26	200,000	32.20	n/a
trans-1,2-Dichloroethene	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.-0.64	n.d.	n.d.	n.d.	200,000	64.40	n/a
Vinyl chloride	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	1,000	0.03	n/a
Benzene	**n.d.-1.0**	**0.46-1.1**	**0.44-0.7**	**0.5**	**0.45-0.81**	**0.48-0.62**	**0.27**	**0.63-1.6**	**0.26-0.49**	0.22-0.25	0.14-0.17	**0.20-0.30**	0.16-0.21	**0.5-1.1**	**0.18-0.71**	0.12-0.21	**1.10**	1,000	0.25	**0.79**
Chloromethane	n.d-0.8	**n.d.-4.9**	n.d.-1.1	0.44	n.d.-0.88	n.d.-0.8	n.d.-1	n.d.-1.6	n.d.-0.78	0.60	0.56-0.82	0.57-0.89	0.56-0.79	n.d.-3.5	n.d.	n.d.	0.26	50,000	1.81	0.60
Bromomethane	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	0.08	0.11-0.13	0.11-0.13	0.09-0.12	n.d.-0.33	n.d.	n.d.-0.15	n.d.	5,000	4.69	0.01
1,1-Dichloroethene	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	--	n.d.	n.d.	n.d.	n/a	0.03	n/a
Methylene Chloride	n.d.-0.52	n.d.-1.2	0.48-2.6	2.2	n.d.-0.27	n.d.	n.d.-0.98	0.12-0.75	n.d.-0.7	0.20-0.21	0.19-0.22	0.21-0.22	0.26-0.84	n.d.-0.79	0.13-0.24	0.22-0.37	n.d.-1.2	500,000	4.11	0.23
1,2-Dichloroethane	**n.d.-0.076**	**n.d.-1.5**	n.d.	n.d.	n.d.	n.d.	n.d.	**n.d.-0.1**	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n/a	0.06	0.02
1,1,2-Trichloroethane	n.d.	**n.d.-0.21**	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	--	n.d.	n.d.	n.d.	10,000	0.08	0.00

TABLE 4.4-10 SUMMARY OF VOC CONCENTRATION (IN PPBV) MEASURED DURING INDOOR AND AMBIENT AIR TESTING PROGRAM

VOC Analyte	Buildings																	Reference Values		
	Hanger 1	Bldg. 6	Bldg. 21	Bldg. 22	Bldg. 26	Bldg. 111	Bldg. 148	Bldg. 156	Bldg. N-269	Bldg. 555	Bldg. 583C	Bldg. 15	Bldg. 2	Bldg. 566	Bldg. 543	Bldg. 476	Ambient Samples	OSHA PEL	EPA PRG	EPA CEP
Chlorobenzene	n.d.-0.47	**n.d.-16**	n.d.-0.071	n.d.	n.d.-0.22	0.07-0.1	n.d.-0.53	n.d.-0.26	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.-0.16	n.d.	n.d.	n.d.	n/a	15.87	0.02
1,3,5- Trimethyl-benzene	n.d.-0.20	n.d.-0.39	n.d.-0.43	n.d.	n.d.	n.d.	n.d.	n.d.-0.93	n.d.-0.044	n.d.-0.08	n.d.	n.d.-0.09	n.d.	n.d.-0.21	n.d.-0.44	n.d.	0.04-0.05	25,000	4.42	n/a
1,2,4- Trimethyl-benzene	n.d.-0.11	n.d.-0.62	0.198	0.082	0.06-0.13	n.d.-0.13	n.d.-0.22	n.d.-2.2	n.d.-0.1	0.22-0.28	0.092-0.095	0.20-0.36	0.15-0.17	n.d.-1.0	n.d.-1.5	n.d.-0.24	n.d.-0.043	n/a	4.42	n/a
1,3-Dichlorobenzene	n.d.	n.d.-0.049	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	--	n.d.	n.d.	n.d.	n/a	4.89	n/a
1,4-Dichlorobenzene	n.d.-0.09	n.d.-0.06	**0.07-0.25**	n.d.	n.d.-0.054	n.d.-0.047	n.d.-0.16	**0.15-7.9**	n.d.-0.052	n.d.	n.d.	n.d.	n.d.	**n.d.-1.7**	n.d.-0.15	**n.d.-0.17**	n.d.-0.05	75,000	0.16	0.02
Chlorotoluene	n.d.	n.d.	n.d.	n..d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	50,000	49.35	n/a
1,4-Dioxane	**n.d.-11**	**n.d.-5.4**	**n.d.-5.9**	**0.71**	**n.d.-4**	n.d.-0.23	**n.d.-7.6**	**n.d.-21**	**0.22-10**	**n.d.**	**n.d.-2.5**	**0.59-1.1**	**0.46-1.0**	**n.d.-7.1**	**0.66-4.5**	**0.5-5.5**	**n.d.-0.83**	100,000	0.59	n/a

Notes: ppbv = parts per billion by volume
OSHA PELS: Occupational Safely and Health Administration Permissible Exposure Limits
Adjusted EPA PRGs: U.S. EPA Region 9 Preliminary Remediation Goals, adjusted for exposure period of 24 hours/day over 20 years
EPA CEP: County-wide average ambient air concentrations as modeled during EPA's Cumulative Exposure Project
n.d: not detected. **Bold and highlighted** values exceed the Adjusted EPA PRG guidelines
* Ambient samples collected at Buildings 6, 26, 148, N-269, 566, 583 and 583C.

Source: SAIC, 2000.

A similar indoor air testing program was conducted for Building 566 by SAIC.[9] Phase 1 of the testing program was developed based on results of a passive gas monitoring survey that identified, but did not quantify, the presence of chlorinated hydrocarbons. Phase 2 used results of Phase 1 to focus on specific rooms within the building. This program also measured elevated benzene levels indoors that were similar to ambient concentrations. These benzene levels were below the adjusted PRG levels, with the exception of one sample that was suspected to be an outlier. Two chlorinated hydrocarbon compounds, 1,4-Dichlorobenzene and trans 1,3-Dichloropropene, were found at levels that exceed their respective adjusted PRGs. Both detections were from one of many samples and were not confirmed through duplicate sample collections. The only other volatile organic compound found at levels above the adjusted PRG was 1,4-Dioxane. This compound was found in a majority of the 19 indoor samples and exceeded the adjusted PRG in two of those samples (Rooms 110 and 111). The report suggested further testing for some of the compounds to more definitively resolve remaining air quality concerns regarding the use of Building 566.

In May of 2000, Harding and Lawson Associates, under contract to NASA, conducted another similar indoor air quality testing program for volatile organic compounds at Buildings 476 and 543.[10] Benzene was detected in both indoor and outdoor samples of both buildings, but levels were below the adjusted PRGs. Similar to other measurement programs, 1,4-Dioxane was detected in all samples. Measured concentrations of 1,4-Dioxane exceeded the adjusted PRGs at both buildings as well as in the ambient air. These levels were well below worker permissible exposure limits. The report recommended further testing to quantify these levels and that restriction on the usage of these

[9] NASA Ames Research Center. *Indoor Air Testing Program Report for Building 566.* December 1999. Prepared by Science Applications International Corporation.

[10] *Indoor Air Quality Investigation Buildings 476 and 543 NASA Ames Research Center.* December 2000. Prepared by Harding ESE, Inc.

buildings for dormitory uses be considered until the source can be located or managed.

In August 2001, Harding ESE collected another set of indoor air samples from Buildings 555, 583C, 15 and 2 and outdoor ambient air samples near these buildings. Results were similar to previous measurements. Overall, levels were slightly lower than previous measurements. Concentrations of 1,4-Dioxane were found to be above the adjusted PRG in all buildings except Building 555.

Maximum concentrations of some of the volatile organic compounds exceeded adjusted PRG, at many of the buildings tested. Results of these studies indicate that all maximum concentrations of volatile organic compounds were below OSHA permissible exposure levels for workers.

The testing results are not conclusive, but they do indicate that without proper remediation or new building design, residential uses located over the highly contaminated areas of the Regional Plume could be exposed to potentially significant levels of toxic air contaminants that are suspected to be emitted from contaminated groundwater and soils. This would be a potentially significant impact if long-term residential uses were to be developed over areas of the Regional Plume with high concentrations of contaminants. However, current plans do not indicate any residential use over highly concentrated areas of the Regional Plume. Student apartments and dormitories are planned on the western edge of the Regional Plume and conference and training lodging is planned to be located over highly concentrated areas. This could cause significant impacts.

Additionally, an Environmental Issues Management Plan (EIMP) has been developed for the project. This plan addresses construction techniques and minimum design requirements for new development located over the Regional Plume to reduce the potential for elevated toxic contaminant levels inside buildings.

c. Exposure to Background Toxic Air Contaminants

The project would not only have the potential to expose people to toxic air contaminants from on-site sources; it would also expose new residents, students and employees to toxic air contaminants that exist in the ambient air in the South Bay region. Monitoring conducted by CARB and BAAQMD reveal that background levels of several toxic air contaminants in many parts of the South Bay exceed acceptable risk levels. New residents, students and employees would be exposed to these background levels of contamination if they live, work or study at the ARC. However, this same exposure already occurs throughout the South Bay, and construction of facilities similar to those proposed under the NADP anywhere in the region would have the same impacts. Therefore, this impact is not considered significant.

d. Cumulative Impacts Related to Toxic Air Contaminants

Development under the NADP would also combine with other projects in the region to increase exposure to toxic air contaminants. NADP and cumulative projects would all lead to increased vehicular traffic, which would increase toxic air contaminant levels. Additionally, both the NADP and cumulative projects would bring additional people to the region, where existing levels of toxic air contaminants already exceed acceptable risk levels, thereby exposing these people to these toxic air contaminants.

5. Construction Emissions

Construction associated with the NADP is anticipated to occur in phases over a 10-year period. No specific construction schedules or plans are available at this time. Construction activities are a source of particulate matter and gaseous emissions during much of the construction period. The pollutants of greatest concern from construction activities are NO_x and PM_{10}. The main sources of PM_{10} emissions would be dust generated from site grading and other disturbance of soil. Other sources of construction-related emissions include exhaust emissions from gasoline or diesel powered construction equipment, solvents in construction materials, and gases emitted from asphalt for a short period of time after paving occurs.

Disturbance to dry soils by graders and other mobile construction equipment could generate substantial amounts of fugitive dust, resulting in elevated PM_{10} concentrations. Wind and disturbance of exposed areas would also be sources of dust emissions. EPA studies have estimated uncontrolled construction related PM_{10} emissions at about 23 kilograms per acre per day (51 pounds per acre per day). These emissions can be reduced greatly through application of control measures. Emissions from construction activities would vary considerably by season and would be greatest during late spring through fall when ground disturbances usually occur. Typical winds at Ames Research Center during this time period are from the northwest. PM_{10} emissions from construction would potentially affect downwind receptors .

Removal of hazardous materials or contaminated soils during demolition could lead to emissions of toxic air contaminants. Buildings constructed prior to 1980 may include asbestos or lead containing materials. NASA is conducting lead and asbestos surveys on all buildings to be demolished. Demolition, renovations or removal of these materials is subject to BAAQMD and California Department of Toxic Substances Control regulations.

Combustion of diesel fuel from heavy-duty equipment and truck traffic associated with construction would result in significant emissions of nitrogen oxides. Construction activities would also result in significant PM_{10} emissions, primarily due to dust generation. The range of annual emissions of pollutants including particulates from construction activities ground disturbance, equipment exhaust, truck exhaust, and worker vehicle exhaust is shown in Table 4.4-11 , which anticipates a 10-year build-out period. Construction plans are not known at this time, so the predicted emissions in Table 4.4-11 should be considered preliminary as they would vary considerably depending on the amount and type of construction activities.

As shown in Table 4.4-11 , preliminary calculations indicate that construction activities associated with all of the alternatives would result in emissions that exceed BAAQMD significance thresholds for nitrogen oxides and PM_{10}, which are more stringent than federal emissions standards.

TABLE 4.4-11 **MAXIMUM ANNUAL AIR POLLUTANT EMISSIONS FROM CONSTRUCTION ACTIVITIES AND CONSTRUCTION WORKER TRAFFIC ASSUMING 10-YEAR BUILDOUT PERIOD**

	Air Pollutant Emissions in Metric Tons Per Year *(tons per year)*		
Project Scenario	**ROG**	**NO_x**	**PM_{10}**
Alternative 1		Baseline	
Alternative 2	7 (8)	106 (116)	120 (132)
Alternative 3	6 (7)	91 (100)	73 (88)
Alternative 4	8 (9)	127 (140)	137 (151)
Alternative 5	5 (6)	75 (82)	117 (129)
Mitigated Alternative 5*	17(19)	99(109)	140(154)
BAAQMD Thresholds	*14 (15)*	*14 (15)*	*14 (15)*

* Due to additional housing in Mitigated Alternative 5, the project would have an 11-year buildout For details see Section 5.4.

Particulate matter from diesel fuel combustion was identified by the California Air Resources Board in 1998 as a toxic air contaminant. Since construction activities associated with the NADP would occur over many years, the potential for exposure of sensitive- receptors (primarily on-site receptors) to unhealthy levels of diesel particulates exists. CARB has recently begun a public process of developing regulations for retrofitting in-use diesel engines to reduce diesel particulate emissions. Over the next few years, CARB plans to develop regulations that address off-road (e.g., construction equipment) diesel-fueled engines (CARB 2001).

The BAAQMD evaluates the significance of construction PM_{10} emissions based on the implementation of effective and comprehensive control measures rather than detailed quantification of construction emissions. NASA is adopting all of the BAAQMD mitigation measures for PM_{10} (through Mitigation Measure AQ-5a, below).

D. Impacts and Mitigation Measures

This section summarizes significant impacts identified in Section C, and proposes mitigation measures for each identified impact.

Impact AQ-1: Build out of the NASA Ames Development Plan would result in population and vehicle uses projections that are inconsistent with regional air quality planning, and in emissions of air pollutants from automobiles and construction equipment which would exceed significance thresholds established by the BAAQMD.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure AQ-1: The NADP includes a proposed TDM plan to reduce automobile trips from existing and planned uses. Even with the substantial reductions in vehicle trips projected in the TDM plan, emissions would remain above BAAQMD significance thresholds. This impact is significant and unavoidable.

Impact AQ-2: Without limits on the timing of construction, emissions of ozone precursors associated with combined construction and operation of the project could exceed 90,719 kilograms (100 tons) in any given year in which construction occurs. This would exceed the *de minimus* levels set forth in the Federal General Conformity Regulation and trigger the need for an additional conformity determination beyond the one proposed for carbon monoxide.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure AQ-2: NASA and its partners would schedule construction to ensure that annual emissions of ozone precursors associated with project construction and operation do not exceed a cumulative total of 100 tons per year. This would apply over all years of project construction and operation or until an applicable State Implementation Plan that includes the project emissions is approved by EPA. Implementation of this mitigation is mandatory to comply with the Federal Clean Air Act.

Impact AQ-3: Proposed laboratories and disaster training facilities would be a potential source of air pollutant emissions, including emissions of toxic air contaminants.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure AQ-3 : Prior to the issue of occupancy permits, operators of laboratories and disaster training facilities would be required to consult with the BAAQMD regarding possible permit requirements and emissions reduction equipment and to comply with BAAQMD's requirements.

Impact AQ- 4: Any long-term residential uses located over high concentrations of the Regional Plume would potentially be exposed to levels of air contaminants that present an adverse health risk.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure AQ- 4: Long-term residential uses would be avoided at areas located over high concentration zones of the Regional Plume in accordance with the Human Health Risk Assessment (HHRA) and EIMP.

Impact AQ-5: New proposed land uses under the NADP would be exposed to elevated levels of toxic air contaminants associated with the Regional Plume. This exposure could present a health risk.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure AQ-5: NASA would review all planned uses in light of the findings of the HHRA to ensure that planned uses would not create unacceptable public health risks. Proposed uses would be moved if unacceptable risks which could not be mitigated to an acceptable level were found.

Impact AQ-6: Construction emissions of PM_{10} associated with new development and renovation of existing facilities would result in potentially unhealthy air pollutant concentrations.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure AQ-6a: Measures to control dust generation would reduce this impact associated with PM_{10} to a level of less-than-significant. The following measures, including all control measures recommended by the BAAQMD, would be incorporated into construction contract specifications and enforced by NASA. These measures include the following provisions:

- Use reclaimed water on all active construction areas at least twice daily and more often during windy periods. Watering is the single-most effective measure to control dust emissions from construction sites. Proper watering could reduce dust emissions by over 75 percent.
- Cover all hauling trucks or maintain at least 0.6 meters (2 feet) of freeboard. Dust-proof chutes would be used as appropriate to load debris onto trucks during any demolition.
- Pave, apply reclaimed water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
- Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas and sweep streets daily (with water sweepers) if visible soil material is deposited onto the adjacent roads.

- Hydro seed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas that are inactive for 10 days or more).
- Enclose, cover, water twice daily, or apply (non-toxic) soil binders to exposed stockpiles.
- Limit traffic speeds on any unpaved roads to 25 kilometers per hour (15 mph).
- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- Replant vegetation in disturbed areas as quickly as possible.
- Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.
- If necessary, install windbreaks, or plant trees/vegetative windbreaks at the windward side(s) of construction areas.
- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 40 kilometers per hour (25 mph) and visible dust emission cannot be prevented from leaving the construction site(s).
- Limit areas subject to disturbance during excavation, grading, and other construction activity at any one time.
- Prior to disturbance (or removal) of materials suspected to contain asbestos, lead or other toxic air contaminants, contact the BAAQMD.
- NASA would designate an *Environmental Coordinator* responsible for ensuring that mitigation measures to reduce air quality impacts from construction are properly implemented. This person would also be responsible for notifying adjacent land uses of construction activities and schedule.

Mitigation Measure AQ-6b: Measures to reduce emissions of nitrogen oxides and particulate matter from diesel fuel combustion during construction should be evaluated and implemented where reasonable and

feasible. The following measures would reduce the impacts from construction fuel combustion:

- Properly maintain construction equipment. This measure would reduce emissions of ROG, NOx and PM_{10} by about 5 percent.
- Evaluate the use of available alternative diesel fuels and where reasonable and feasible, use alternative diesel fuels. *The CARB has verified reductions of NOx by almost 15 percent, and particulate matter by almost 63 percent, from use of alternative diesel fuels. However, the use of these fuels may not be appropriate for all diesel equipment*.
- Reduce construction traffic trips through TDM policies and implementation measures.
- Reduce unnecessary idling of construction equipment and avoid staging equipment near or upwind from sensitive receptors such as on-site residences or daycare uses.
- Where possible, use newer, cleaner burning diesel-fueled construction equipment. The *Environmental Coordinator* would prohibit the use of equipment that visibly produces substantially higher emissions than other typical equipment of similar size.

Impact AQ-7: Construction emissions associated with new development and renovation of existing facilities would result in potentially unhealthy air pollutant concentrations.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure AQ-7a: NASA would install air pollution devices, for example, particulate traps and oxidation catalysts, on construction equipment to the greatest extent that is technically feasible.

Mitigation Measure AQ-7b: NASA and its partners would develop and implement a Construction Emissions Mitigation Plan (CEMP) to ensure

that the project would comply with the Federal Clean Air Act and further reduce emissions. The plan would include measures and procedures, sufficiently defined to ensure a reduction of nitrogen oxides, PM_{10}, and diesel particulate matter.

The CEMP would be developed in consultation with EPA and BAAQMD. The CEMP would be evaluated by NASA and its partners on an annual basis to schedule construction ensuring that emissions of ozone precursors associated with project construction and operation would not exceed 91 tonnes (100 tons) per year and update measures to include new rules or regulations. NASA and its partners would consult with the BAAQMD on an annual basis during project construction to determine if additional air quality mitigations to reduce the project's air quality impact are warranted, and to take such additional air quality mitigation as is appropriate and reasonable, and in an expeditious manner.

A CEMP coordinator, who would also act as a "Disturbance Coordinator" would be responsible for ensuring that measures included in the CEMP are implemented. This would be done through field inspections, records review, and investigations of complaints.

At a minimum, the CEMP would include the following measures to reduce emissions from construction activities:

- Require that all equipment is properly maintained at all times. All construction equipment working on site would be required to include maintenance records indicating that all equipment is tuned to engine manufacturer's specifications in accordance with the time frame recommended by the manufacturer.
- All construction equipment would be prohibited from idling more than 5 minutes.
- Tampering with equipment to increase horsepower would be strictly prohibited.

- Include particulate traps, oxidation catalysts and other suitable control devices on all construction equipment used at the site.
- Diesel fuel having a sulfur content of 15 ppm or less, or other suitable alternative diesel fuel, would be used unless such fuel cannot be reasonably procured in the market area.
- The CEMP would also ensure that construction-related trips are minimized through appropriate policies and implementation measures.
- The CEMP would address the feasibility on a biannual basis of requiring the use of reformulated or alternative diesel fuels.
- The CEMP Coordinator (or Environmental Coordinator) would prohibit the use of equipment that visibly produces substantially higher emissions than other typical equipment of similar size.
- The staging of three or more pieces of construction equipment near or just upwind from sensitive receptors such as residences or daycare uses would be prohibited.

Mitigation Measure AQ-7c: The CEMP would address the feasibility of requiring or encouraging the use of "Cleaner" (Lower Emissions) construction equipment on an annual basis. For larger construction projects (i.e. projects greater than 9,290 square meters (100,000 square feet)), a percentage of the equipment would be required to be 1996 or newer. This would be determined as follows:

- If equipment is leased by the contractor, then the percentage of 1996 or newer equipment would be maximized so that the total cost of leasing equipment would not exceed 110 percent of the average available cost for leased equipment.
- If equipment is owned by the Contractor, then the CEMP shall identify the minimum percentage of total horsepower for 1996 or newer equipment that should be used in construction. For the first year of construction, it shall be considered possible that 1996 or newer

equipment shall makeup a minimum of 75 percent of the total horsepower, unless NASA and its partners can show the BAAQMD that it is not reasonable.

4.5 INFRASTRUCTURE AND DRAINAGE

This section discusses proposed utility systems at Ames Research Center, each of the alternatives' potential impacts on the local and regional systems, and proposes mitigation measures to address them.[1]

A. Water

The following section describes the NASA Ames Development Plan's (NADP) potential impacts to the water system at Ames Research Center. Mitigation measures, where needed, are at the end of this section.

1. Standards of Significance

An alternative for the NADP would have a significant impact with respect to the water system if it would:

- Create a demand for water service that exceeds existing water supply capacity to Ames Research Center.
- Place a demand on existing water distribution facilities that exceeds available conveyance capacity to Ames Research Center.
- Substantially deplete ground water supplies.
- Exceed baseline water demand projected to occur under baseline conditions defined in Chapter 2 to the extent that this exceedance would interfere with provision of water service to existing off-site land uses.

2. Impact Discussion

Tables 4.5-1 and 4.5-2 present the annual and peak water demands for the five alternatives as a whole and in individual development areas. These demands are based on the use of low-flow plumbing fixtures in all new construction, as required by the sustainable design provisions of the NASA Research Park

[1] In this section, the precision of the calculations is appropriate for this level of environmental review. However, no detailed discussions of required infrastructure improvements should occur without performing a similarly detailed analysis of expected demands and design of proposed systems.

Design Guide. The annual water savings due to the use of low-flow fixtures is presented in Table 4.5-3. Irrigation use is listed as zero where it will be provided by reclaimed water, as discussed in the Section B, below. The annual water savings due to the use of reclaimed water for irrigation is equal to the reclaimed water demand presented in Tables 4.5-5 and 4.5-6.

a. Annual Water Demand

Existing annual demand for the development areas covered by the EIS is roughly 901 mega-liters (238 million gallons). As shown in Table 4.5-1, Alternatives 2 and 4 would each increase the total annual water demand over this amount. Alternatives 1, 3 and 5 would result in a reduction in overall annual water demand as compared to current annual demands. However, Mitigated Alternative 5 would increase annual total water demand over the existing amount.

The increased demand generated under Alternatives 2 and 4 would create additional demand on the SFWD system. However, the projected increase in demand from Alternative 4, which would be highest of any of the alternatives at 146 mega-liters (39 million gallons), would represent only 0.11 percent of the total water demand on the SFWD system projected for 2030, as shown in the San Francisco Public Utilities Commission's Water Supply Master Plan (April 2000). Alternative 2 would represent an even smaller percentage. Given the small amount of additional water demand, this would not constitute a significant impact.

b. Peak Water Demand

Existing peak demand for the development areas covered by the EIS is roughly 9,729 liters per minute (2,570 gpm). As shown in Table 4.5-2, the expected peak demands associated with Alternatives 1 through 5 would be less than this amount.

TABLE 4.5-1 **ANNUAL POTABLE WATER DEMAND**

Annual Water Demand in Mega-Liters
(Annual Demand in Millions of Gallons)

	Alternatives					
Development Area	**1**	**2**	**3**	**4**	**5**	**Mitigated 5***
NRP	267.0 (70.5)	335.9 (88.7)	416.1 (109.9)	279.1 (73.7)	291.0 (76.9)	371.7 (98.2)
NRP Irrigation	109.5 (28.9)	0	0	0	0	0
Bay View	0	142.4 (37.6)	0	300.0 (79.3)	183.9 (48.6)	266.3 (70.4)
Bay View Irrigation	0	0	0	0	0	0
East Side/Airfield	35.5 (9.4)	121.0 (32.0)	78.7 (20.8)	131.0 (34.6)	36.5 (9.6)	36.5 (9.6)
East Side/ Airfield Irrigation	6.4 (1.7)	0	6.4 (1.7)	0	0	0
Moffett Field Golf Course	115.5 (30.5)	0	0	0	0	0
Ames Campus	183.2 (48.4)	183.2 (48.4)	183.2 (48.4)	183.2 (48.4)	224.7 (59.4)	224.7 (59.4)
Ames Campus Irrigation	153.6 (40.6)	153.6 (40.6)	153.6 (40.6)	153.6 (40.6)	153.6 (40.6)	153.6 (40.6)
Total	871 (230)	936 (247)	838 (221)	1,047 (277)	890 (232)	1,053 (278)

Note: For existing facilities, demand is not reduced for low flow fixtures. Irrigation demand is included only for areas that will be irrigated with potable water.
* For details see Section 5.5

TABLE 4.5-2 **PEAK POTABLE WATER DEMAND**

	Peak Water Demand in Liters per Minute (Peak Demand in Gallons per Minute) Alternatives					
Development	**1**	**2**	**3**	**4**	**5**	**Mit. 5***
NRP	2,031 (536)	2,554 (675)	3,164 (836)	2,123 (561)	2,213 (585)	2,828 (747)
NRP Irrigation	1,761 (465)	0	0	0	0	0
Bay View	0	1,083 (286)	0	2,282 (603)	1,398 (369)	2,025 (535)
Bay View Irrigation	0	0	0	0	0	0
East Side/Airfield	270 (71)	920 (243)	599 (158)	996 (263)	278 (73)	278 (73)
East Side/Airfield Irrigation	103 (27)	0	103 (27)	0	0	0
Moffett Field Golf Course	1,325 (350)	0	0	0	0	0
Ames Campus	1,394 (368)	1,394 (368)	1,394 (368)	1,394 (368)	1,709 (451)	1,709 (451)
Ames Campus Irrigation	2,471 (653)	2,471 (653)	2,471 (653)	2,471 (653)	2,471 (653)	2,471 (653)
Total	9,355 (2,470)	8,422 (2,225)	7,731 (2,042)	9,266 (2,448)	8,069 (2,131)	9,311 (2,459)

Note: For existing facilities, demand is not reduced for low flow fixtures. Irrigation demand is included for areas that will be irrigated with potable water.

* For details see Section 5.5

TABLE 4.5-3 **ANNUAL POTABLE WATER SAVINGS**

	Annual Savings in Mega-Liters (Annual Savings in Millions of Gallons) Alternatives					
Development	**1**	**2**	**3**	**4**	**5**	**Mit. 5***
NRP	44.8	187.3	240.6	155.4	175.3	209.7
	(11.8)	(49.4)	(63.6)	(41.0)	(46.3)	(55.4)
Bay View		82.3		172.1	84.0	120.8
	0	(21.7)	0	(45.5)	(22.2)	(31.9)
East Side/Airfield		71.4	43.2	78.0	0.7	0.7
	0	(18.9)	(11.4)	(20.6)	(0.2)	(0.2)
Ames Campus					27.7	27.7
	0	0	0	0	(7.3)	(7.3)
Total	45	341	284	406	288	359
	(12)	(90)	(75)	(107)	(76)	(95)

Note: This table presents annual water savings due to the use of low flow fixtures. The annual water savings due to the use of reclaimed water for irrigation is equal to the reclaimed water demand presented in Tables 4.5-5 and 4.5-6.
* For details see Section 5.5

c. Off-Site Supply Lines

The Hetch Hetchy aquaduct and the three main service lines that supply water to Ames Research Center have adequate capacity to supply water for all development foreseen under all of the alternatives.

SFWD would continue to supply domestic water to Ames Research Center. As an alternative, the Bay View area could be served by the City of Mountain View. This would alter the point of connection for Bay View but would not change the regional impacts because Mountain View has stated that any water provided to NASA would come from Hetch Hetchy.

d. On-Site Water Delivery

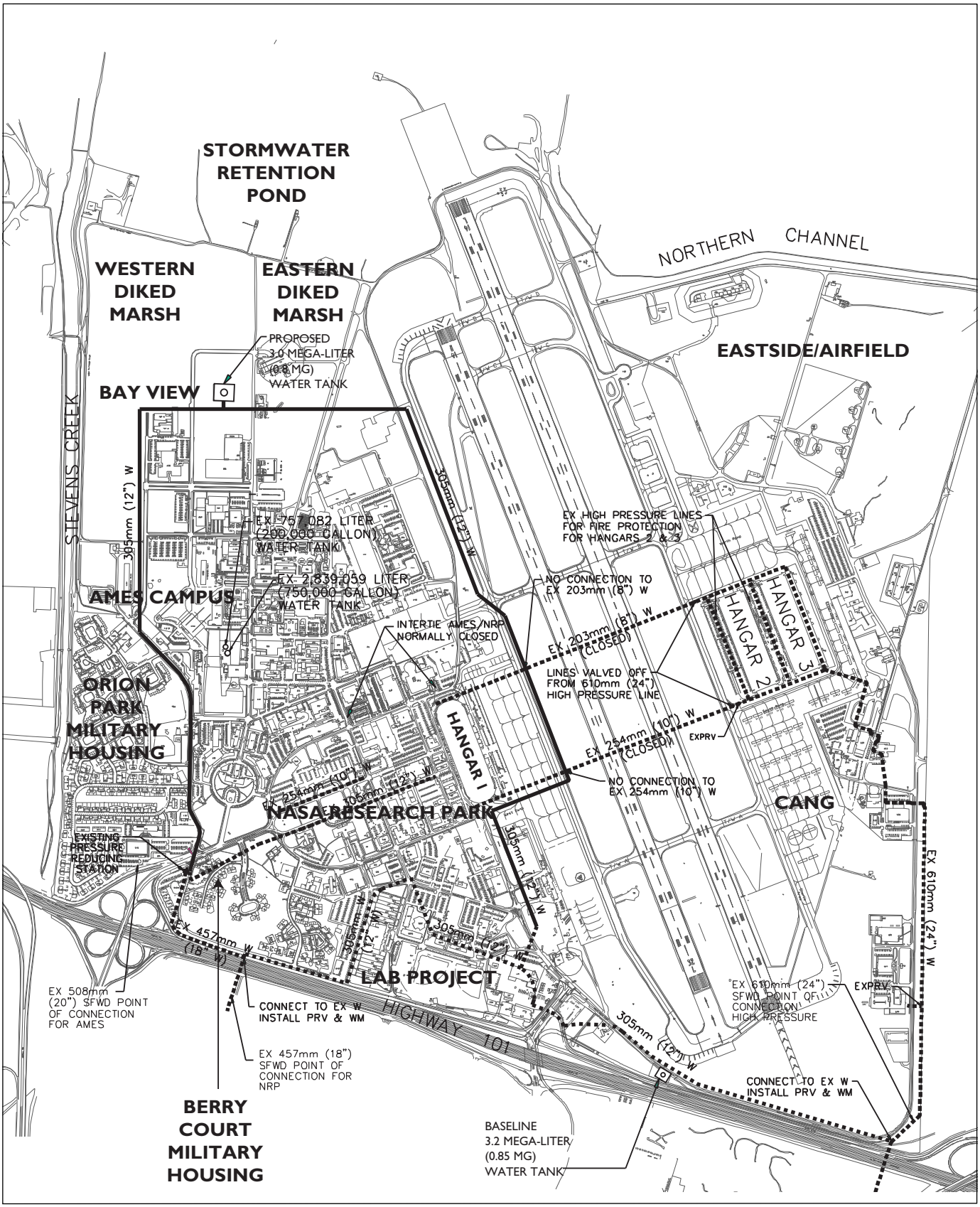
The primary factor in determining peak water demand is the flow requirement for fire protection. Under normal operating conditions, SFWD will be able to meet the demand for fire flow. In the event of an interruption of service (such as a break in the Hetch Hetchy line), emergency water supply is required to provide fire flow for the duration of the fire plus operational storage. Fire demand for all alternatives in all planning areas is 11,000 liters per minute (3,000 gpm) for 4 hours.

These conclusions assume that all new and renovated buildings would be equipped with a fire sprinkler system. Because the installation of fire sprinkler systems in buildings is so effective in assisting with fire suppression, the Uniform Fire Code allows a significant reduction in the required flow rate for development with sprinkler systems. In addition, fire sprinkler systems increase the level of protection to life and property. For these reasons, all new development under the NADP would include fire sprinkler systems.

Storage tanks for emergency water supply will be installed to provide fire flow for the duration of the fire plus operational storage in NRP and Bay View. The storage tank in Bay View will also provide for three days of average residential domestic use. A pump distribution system would be installed with each tank.

Table 4.5-4 presents the storage volume to be installed. The proposed locations of the water storage tanks are presented diagrammatically in Figure 4.5-1.

The four development areas would have independent water systems. Existing valves between the Ames Campus and Shenandoah Plaza normally remain closed because of differences in water pressure, as described in Section 3.5, and would continue to remain closed because the systems will be independent. These valves could be opened in the event of a fire in the Ames Campus area during an interruption of service. The water used to fight the fire would deplete the storage for the NRP area. A mechanism would be put in place to replenish the storage in the NRP in order to restore the level of protection for



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0 278ft 556ft

Source: BKF

Baseline Water Mains ·····

Proposed Water Mains ——

Water Tank ○

FIGURE 4.5-1

PROPOSED CONDITIONS WATER SYSTEM

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

TABLE 4.5-4 **WATER STORAGE VOLUMES**

Development Area	Volume of Storage Liters	Volume of Storage Gallons
NRP*	3,200,000	850,000
Bay View	3,000,000	800,000

* This storage is included in the baseline condition.

which the system is designed. For example, water could be trucked in and pumped into the storage tank to be available in case of another fire.

e. Cumulative Impacts

As noted in Chapter 2, significant additional cumulative projects are planned in the Mountain View/Sunnyvale area. Although the NADP alternatives would generate little or no additional water demand, these cumulative projects would generate an increase in annual water demand of approximately 5,000 mega-liters (1,300 million gallons), which would represent an increase of 3 percent of the current annual usage in the SFWD. This would constitute a significant impact from cumulative projects, although it is not associated with the project.

3. Impacts and Mitigation Measures

Since no impacts to the water system have been identified, no mitigation measures are necessary.

B. Reclaimed Water

The following section describes the NADP's potential impacts to the reclaimed water system at Ames Research Center.

1. Standards of Significance

An alternative for the NADP would have a significant impact with respect to reclaimed water if it would:

- Create a demand for reclaimed water service that exceeds existing supply capacity.
- Place a demand on existing reclaimed water distribution facilities that exceeds available conveyance capacity.
- Interfere with provision of reclaimed water service to existing land uses.
- Interfere with provision of reclaimed water service for future, planned development.

2. Impact Discussion

a. Regional Capacity

The primary use for reclaimed water under the NADP would be irrigation. The City of Sunnyvale has indicated that there is adequate reclaimed water available from its system to serve all of Ames Research Center's irrigation demands. The City of Mountain View anticipates that its future system will also provide an abundant supply of irrigation water. The availability of reclaimed water thus would not be an issue.

In addition to sources from Sunnyvale and Mountain View, reclaimed water from the remediation of the Regional Plume is available as well, with water from the Navy available for irrigation and water from the MEW companies available for use in cooling towers and boilers.

b. Off-Site Reclaimed Water Supply Lines

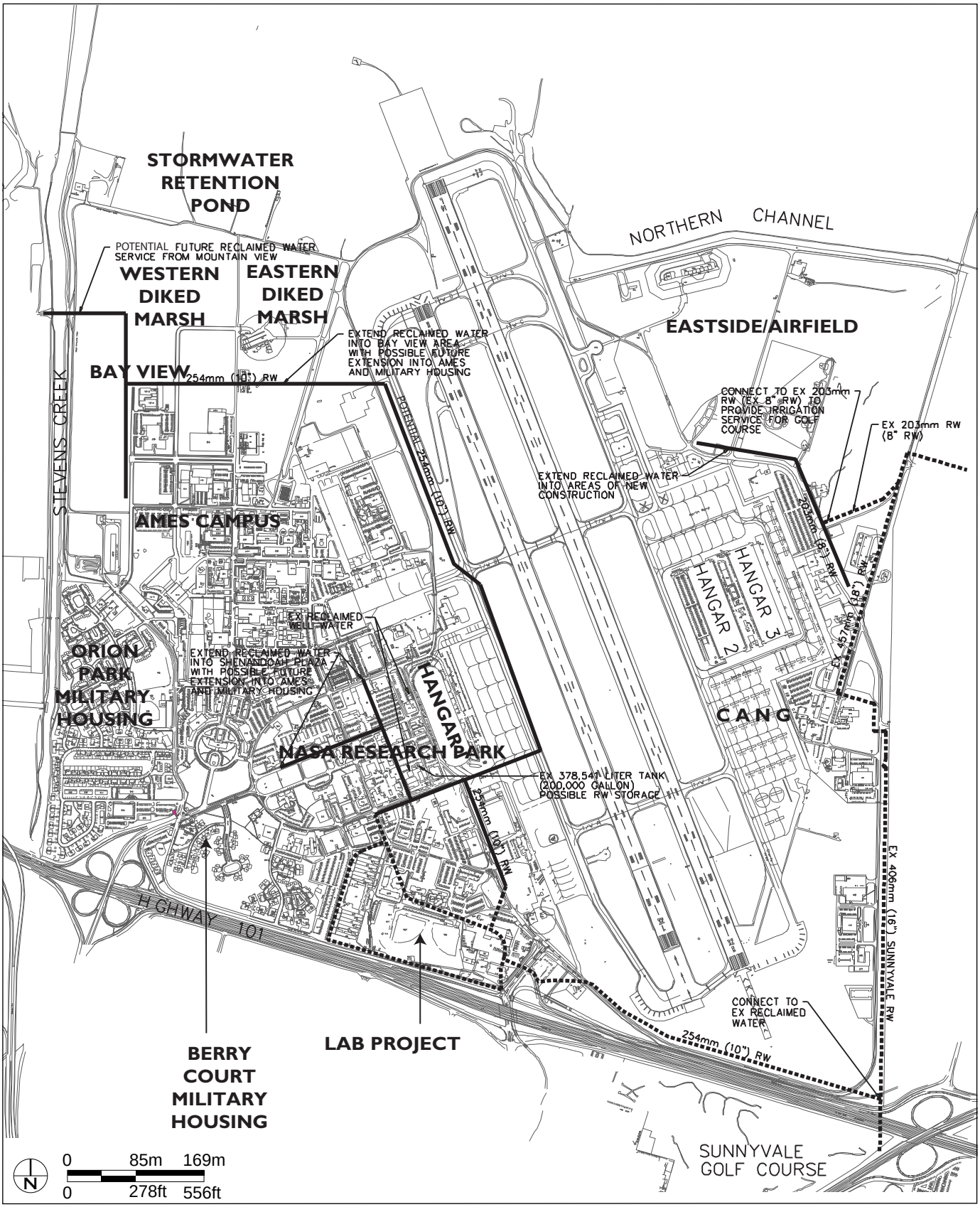
At present, a main line supplying reclaimed water from the City of Sunnyvale enters the site at the Lockheed Gate, just north of First Avenue. The line runs south along East Patrol Road and Macon Road and leaves Ames Research Center at the southeast corner of the site, near the intersection of Highways 101 and 237.

c. On-Site Reclaimed Water Delivery

The existing and proposed reclaimed water lines are shown in Figure 4.5-2.

Reclaimed water from the Sunnyvale line is available for irrigation use throughout the Eastside/Airfield area. Reclaimed water would be supplied to the other three planning areas in one of two ways, depending on the phasing of the NADP and the timing of the construction of the Mountain View supply line. The Sunnyvale reclaimed water main could be extended to the west side of the airfield to supply proposed development in the NRP area and perhaps the Bay View area as well. Alternatively, reclaimed water from the City of Mountain View could be available for the proposed development in Bay View, and could be extended into the Ames Campus and NRP areas if necessary. It may turn out that the demand from the Bay View, NRP and Ames Campus areas would require supply from both directions to meet the peak demand at the areas most distant from the points where reclaimed water enters Ames Research Center.

The proposed development in the Bay View area, parts of the Eastside/Airfield area, and the portion of the NRP area south of Shenandoah Plaza would require new roadway systems. The distribution piping for the reclaimed water would be installed along with the other underground utilities as the roadway system was developed, and would be immediately available for irrigating roadway and site landscaping. Installation of the reclaimed water system in the Shenandoah Plaza Historic District, and possible extension into the Ames Campus area, would be phased with planned upgrades in utility service.



Source: BKF

Baseline Reclaimed Water Mains .....

Proposed Reclaimed Water Mains ——

Note: Bay View will potentially be served from Mountain View or Sunnyvale (via NRP).

FIGURE 4.5-2

PROPOSED CONDITIONS RECLAIMED WATER SYSTEM

d. Reclaimed Water Use

Tables 4.5-5 and 4.5-6 present the reclaimed water demands for irrigation under the five alternatives in each development area. Under the NADP, reclaimed water would be used for irrigation at the Moffett Field Golf Course, which is not currently the case. Therefore, peak existing potable water demand would be decreased by roughly 1,325 liters per minute (350 gpm) and annual existing potable water demand would be decreased by 115.5 mega-liters (30.5 million gallons). This is a significant reduction in the demand for potable water and represents more than 10 percent of the total expected potable water demand for Ames Research Center.

The planned use of reclaimed industrial wastewater and treated groundwater for industrial uses such as cooling and boiler makeup in the Ames Campus Area would provide additional reductions in potable water use. Total annual water savings from industrial uses would be 54.5 mega-liters (14.4 million gallons). Because NASA is in the process of implementing this program, this savings has not been deducted from total potable water demands shown in Table 4.5-1.

3. Impacts and Mitigation Measures

Since no impacts to the reclaimed water system have been identified, no mitigation measures are necessary. As noted above, however, the installation of a reclaimed water system in parts of the study area would serve to avoid impacts to water supply from the project.

C. Sanitary Sewer

The following section describes the NADP's potential impacts to the sanitary sewer system at Ames Research Center. Mitigation measures, where needed, are at the end of this section.

TABLE 4.5-5 **ANNUAL RECLAIMED WATER DEMAND (FOR IRRIGATION)**

Annual RW Demand in Mega-Liters
(Annual RW Demand in Millions of Gallons)

	Alternatives					
Development	**1**	**2**	**3**	**4**	**5**	**Mit. 5****
NRP	17.8 (4.7)	127.2 (33.6)	127.2 (33.6)	127.2 (33.6)	127.2 (33.6)	127.2 (33.6)
Bay View	0 (0)	61.0 (16.1)	0 (0)	61.0 (16.1)	61.0 (16.1)	61.0 (16.1)
East Side/Airfield (not including golf course)	0 (0)	56.7 (15.0)	0 (0)	56.7 (15.0)	6.4 (1.7)	6.4 (1.7)
Moffett Field Golf Course	0 (0)	115.5 (30.5)	115.5 (30.5)	115.5 (30.5)	115.5 (30.5)	115.5 (30.5)
Ames Campus *	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	17.8 (4.7)	360.4 (95.2)	242.7 (64.1)	360.4 (95.2)	310.1 (81.9)	310.1 (81.9)

* Ames Campus will not be retrofitted to provide reclaimed water for irrigation use.
** For details see Section 5.5

1. Standards of Significance

An alternative for the NADP would have a significant impact with respect to the sanitary sewer system if it would:

- Create a demand for wastewater treatment that exceeds existing treatment capacity.
- Place a demand on existing wastewater collection facilities that exceeds the available conveyance capacity.
- Interfere with provision of service to existing land uses.
- Utilize treatment or conveyance capacity intended for identified future projects.

TABLE 4.5-6 **PEAK RECLAIMED WATER DEMAND (FOR IRRIGATION)**

	Peak RW Demand in Liters per Minute (Peak RW Demand in Gallons per Minute) Alternatives					
Development Area	**1**	**2**	**3**	**4**	**5**	**Mit. 5****
NRP	305 (80)	2,045 (540)	2,045 (540)	2,045 (540)	2,045 (540)	2,045 (540)
Bay View	0 (0)	985 (260)	0 (0)	985 (260)	985 (260)	985 (260)
East Side/Airfield (not including golf course)	0 (0)	910 (240)	0 (0)	910 (240)	103 (27)	103 (27)
Moffet Field Golf Course	0 (0)	1,325 (350)	1,325 (350)	1,325 (350)	1,325 (350)	1,325 (350)
Ames Campus *	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	305 (80)	5,265 (1,390)	3,370 (890)	5,265 (1,390)	4,458 (1,177)	4,458 (1,177)

* Ames Campus will not be retrofitted to provide reclaimed water for irrigation use.
** For details see Section 5.5

2. Impact Discussion

As described in Section 3.5, Ames Research Center's sewage needs are currently served by Sunnyvale, Mountain View and Palo Alto. The areas served by the each of the cities would not change with the implementation of the NADP. The Sunnyvale Water Pollution Control Plant (SWPCP) would continue to serve the NRP area, the Eastside/Airfield area (including the California Air National Guard area), the southern and eastern portion of the Ames Campus area, and the Berry Court Military Housing area through the eastern sanitary sewer system. The City of Mountain View and the Palo Alto Regional Water Quality Control Plant (PARWQCP) would continue to serve the remainder of the Ames Campus area, the Orion Park housing area, and the Bay View area through the western sanitary sewer

system. Both eastern and western sanitary sewer systems, as well as existing and proposed sanitary sewer systems, are presented diagrammatically in Figure 4.5-3.

The total peak sewer flow from proposed development under the NADP has been calculated in two ways. The first estimates the maximum flow that would be expected to leave the site and enter the conveyance system owned by the cities. For practical purposes, this flow is considered to be an instantaneous maximum, and is used to determine the impact to the sewer piping system. The second method for calculating total peak sewer flow estimates the flow that is expected to leave the site during a maximum day. This flow is used to determine the impact to the treatment plant.

Each maximum flow has two components. The first is dry weather flow. This is the flow that results from domestic and industrial use. The second component is inflow and infiltration, commonly referred to as I and I or I/I. This is the flow that results from surface storm runoff entering the sewer system through manholes (inflow) and from groundwater entering the sewer system through cracks and loose joints (infiltration). In areas of high groundwater, a certain amount of infiltration occurs during dry weather. Since the peak flows are estimated during wet weather conditions, this fine point is not critical to the calculations. For clarity, the peak wet weather flow used to determine the impact to the sewer piping system is presented in liters per minute and gallons per minute, while the peak wet weather flow used to determine the impact to the treatment plant is presented in megaliters per day and millions of gallons per day.

a. Eastern Sanitary Sewer System

Table 4.5-7 presents the sanitary sewer demands under each of the alternatives for the eastern sanitary sewer system.

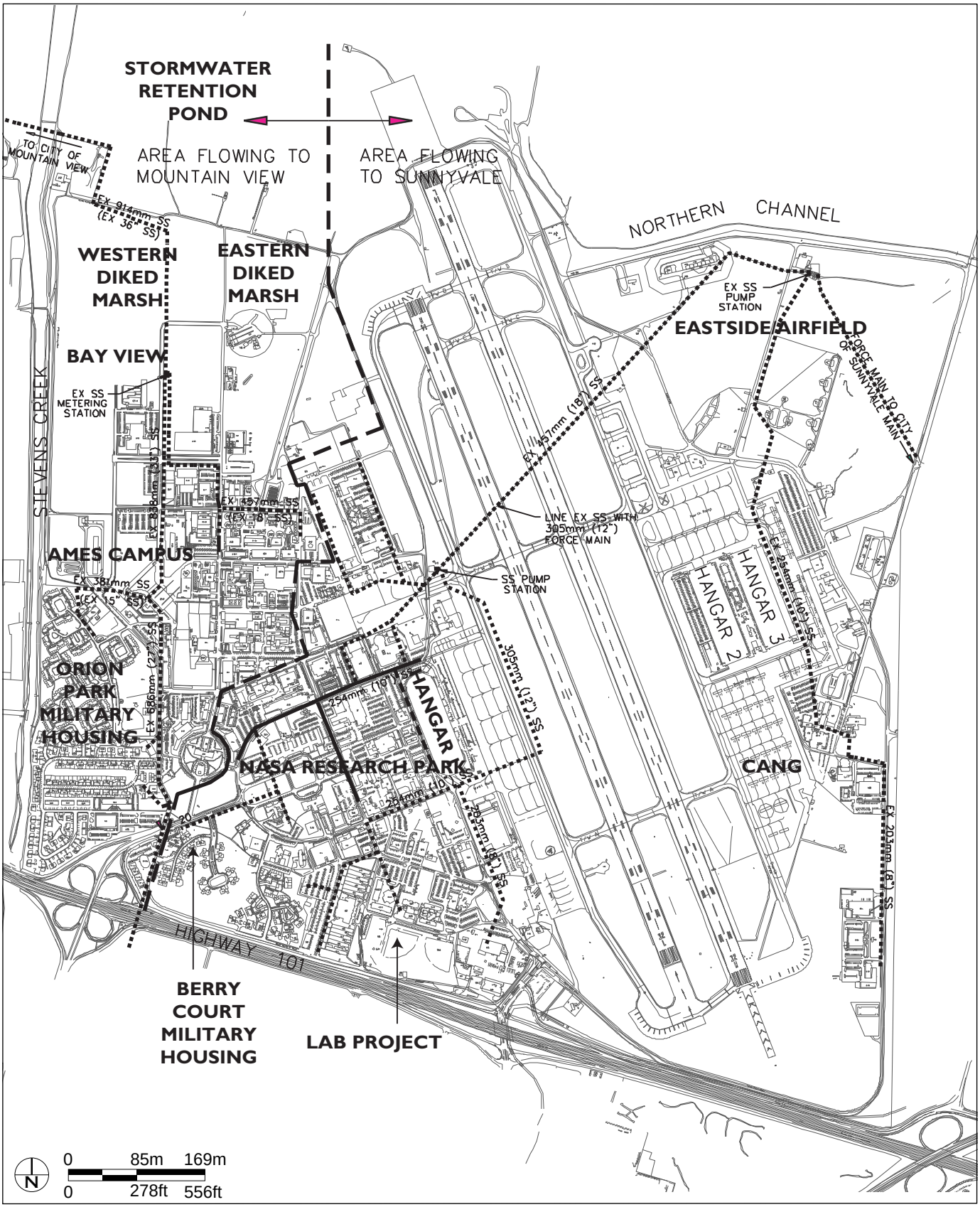
The current metered sewer flow at the existing pump station is 4,900 liters per minute (1,320 gpm) and 3.26 mega-liters per day (0.86 MGD), using the conventions in the table above. By comparison, Alternatives 1 and 5 would not create significant impacts to the existing system. The flow from Alternative 1 is almost equal to the existing flow. The flow from Alternative 5, which represents a 1.4 percent increase

over existing, is essentially equal to the existing flow given the nature of planning level calculations. The reason for the negligible increase in discharge would be the installation of new sewer lines to serve the proposed development. The new lines would reduce I/I, which would offset the increase in domestic flow from the proposed development.

The increases from Alternatives 2, 3 and 4 are greater (14 to 24 percent increase), and would be significant. Assuming a 0.5 percent pipe slope, the additional flow from these alternatives would require a parallel pipe between 152 mm (6 inches) and 203 mm (8 inches) in diameter between ARC and the treatment plant, which is the size of a standard sewer main. By comparison, Alternative 5 would require a 64 mm (2.5 inch) pipe, which is smaller than a house lateral.

Several recent developments east of Ames Research Center have impacted the conveyance system between the Center and the SWPCP, and observation indicates that portions of the system are already flowing at maximum capacity. In addition, many future development projects are planned for this area, which would produce total flows in excess of the capacity of the conveyance system. Before the discharge from Ames Research Center exceeds the historical maximum from the site of approximately 3.79 mega-liters per day (1.0 MGD), the system would have to be upgraded to accommodate the increased flows from Ames Research Center and flows from adjacent developments. Because the system consists of many interconnected lines that have been abandoned and later reopened for use, it may be more efficient to install a parallel system to convey sewer discharge directly from Ames Research Center to the SWPCP.

Treatment capacity is not an issue in the eastern sanitary sewer system because the peak daily flow from Ames Research Center with implementation of the NADP would be a small percentage of the 112 mega-liters per day (29.5 MGD) capacity of the SWPCP. Current loading on the treatment plant is 62.5 mega-liters per day (16.5 MGD) and the modest increases from the proposed project would not threaten the



Source: BKF

Baseline Sanitary Sewer Mains

Proposed Replacement Sanitary Sewer Mains

Limits of Municipal Sewer Service Area

FIGURE 4.5-3

PROPOSED CONDITIONS SEWER SYSTEM

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

TABLE 4.5-7 **EASTERN SANITARY SEWER SYSTEM DEMANDS**

	Peak Wet Weather Flow Alternatives					
	1	**2**	**3**	**4**	**5**	**Mit.5***
Flow rate for determining impacts to pipe system liters per minute (gpm)	4,993 (1,319)	5,966 (1,576)	6,209 (1,640)	5,671 (1,498)	5,057 (1,336)	5,433 (1,438)
Flow rate for determining impacts to treatment plant mega-liters per day (MGD)	3.29 (0.87)	4.05 (1.07)	4.09 (1.08)	3.86 (1.02)	3.33 (0.88)	3.56 (0.94)

* For details see Section 5.5

Plant's ability to handle total peak flows from the remaining areas that it serves. Cumulative projects in the City of Sunnyvale are expected to generate 29.5 mega-liters per day (7.8 MGD), bringing the total load on the plant to 95.8 mega-liters per day (25.3 MGD), which is still less than the Plant's capacity. Discussions with the SWPCP staff indicate that the existing treatment facility has sufficient capacity to support the proposed development, and there are no plans for expansion of the facility.

As mentioned above, the installation of new sewer lines within Ames Research Center to serve the proposed development would reduce I/I, as would any repair and rehabilitation of existing sewer lines. This would reduce the total peak wet weather flow leaving the site, and could be a mitigating factor to offset the increase in domestic flow from the proposed development.

The existing sewer pump station that discharges into the Sunnyvale system has a capacity of approximately 7,600 liters per minute (2,000 gpm), which exceeds the peak flow expected from any of the alternatives. However, the pump station is nearing the end of its useful life and would need to be replaced at some point during the implementation of the NADP.

The sanitary sewer conveyance system between Ames Research Center and the SWPCP is experiencing capacity problems under existing conditions. Based on the September 2001 list of approved projects provided by the Sunnyvale Planning Department, portions of the conveyance piping will require upgrading regardless of whether or not the development proposed under the NADP proceeds. NASA is not obligated to contribute to the solution of this problem until such time as discharge from the development proposed under the NADP begins to impact the City system. At that time, NASA would negotiate an agreement with the City to contribute its fair share to the solution of the sewer capacity problem.

The discharge from Ames Research Center for the Preferred Alternative would not exceed the historical maximum of 1.0 MGD. It is assumed that the cost of the improvements to the City's sanitary sewer conveyance system would be shared by all development that discharges to the piping to be upgraded. NASA would not be obliged to commission studies of current usage, capacities and new flows of Sunnyvale's system. NASA cannot control the approval of projects outside its boundaries that would push the total flow to the SWPCP above the threshold that triggers expansion of the plant. These issues would be addressed during the CEQA process for the projects that would increase their discharge to the plant.

b. Western Sanitary Sewer System - Mountain View and Palo Alto

Table 4.5-8 presents the sanitary sewer demands for the western sanitary sewer system, which is served by the City of Mountain View and Palo Alto, for the different alternatives. The current flow is 3,300 liters per minute (872 gpm) and 2.20 mega-liters per day (0.58 MGD) using the conventions previously discussed.

Alternatives 1 and 3 would not add flow to the western sewer system. Therefore, they do not create impacts to the existing pipe system. The increases from Alternatives 2, 4 and 5 vary from 34 to 65 percent, and would be significant.

Assuming a 0.5 percent pipe slope, the additional flow from these alternatives would require a parallel pipe between 203 mm (8 inches) and 254 mm (10 inches) in diameter between ARC and the treatment plant, which is slightly larger than a standard sewer main.

TABLE 4.5-8 **WESTERN SANITARY SEWER SYSTEM DEMANDS**

	Peak Wet Weather Flow Alternatives					
Development Area	**1**	**2**	**3**	**4**	**5**	**Mit.5***
Flow rate for determining impacts to pipe system liters per minute(gpm)	3,300 (872)	4,440 (1,173)	3,300 (872)	5,477 (1,447)	4,460 (1,178)	4,840 (1,278)
Flow rate for determining impacts to treatment plant mega-liters per day (MGD)	2.20 (0.58)	2.99 (0.79)	2.20 (0.58)	3.60 (0.95)	3.22 (0.85)	3.41 (0.90)

* For details see Section 5.5

The conveyance system between Ames Research Center and the PARWQCP already has capacity problems during wet weather. The lift station located near the Mountain View Golf Course collects discharge from a large area to the west of Ames Research Center, to the south of Highway 101, and from ARC itself. A few times each year, peak flows exceed the capacity of this lift station. When the capacity of the lift station is exceeded, the pumps shut down and the system goes into gravity bypass mode, which allows flow to back up past the Ames Research Center metering station.

In general, this situation would not change with the increased flows from the NADP. Gravity bypass mode would continue to be employed during peak flows. Although the back up would extend farther upstream and take longer to dissipate, the Mountain View system would be able to handle the increased flow. However, this operating condition does not conform to standard engineering practice and it will worsen as other development occurs. An additional 620,000 square feet of office space is planned in cumulative projects for the area currently served by the lift station. An initial study of the lift station indicates that increasing its capacity would not be an effective solution because the capacity of the pipes downstream is the limiting factor. Instead, City staff has been studying the installation of a new gravity

line between the area now served by the lift station and the PARWQCP to address the existing capacity problem and to accommodate the future expected flows from this area. This line would also serve the ARC. The existing lift station would remain in service but would serve a much smaller area.

The peak daily flow from Ames Research Center is a small percentage of Mountain View's allocation at the PARWQCP, which is 114 mega-liters per day (30 MGD) for peak wet weather flow. However, the flow for all alternatives would exceed what is specified in the 1993 agreement (which was renewed in 1999) between PARWQCP and Ames Research Center. Therefore, the agreement would need to be amended to allow for increased flows.

Cumulative projects in the City of Mountain View are expected to generate 2.3 mega-liters per day (0.6 MGD) peak wet weather flow, bringing the total load on the plant from Mountain View and ARC to 89 mega-liters per day (23.5 MGD), which is still less than Mountain View's allocation of plant capacity.

Wherever new sewer lines are installed, they would reduce I/I, as would repair and rehabilitation of existing sewer lines. This would reduce the total peak wet weather flow leaving Ames Research Center and would be a mitigating factor to offset the increase in domestic flow from the proposed development.

3. Impacts and Mitigation Measures

This section summarizes significant impacts to the sanitary sewer system, and proposes mitigation measures for each identified impact.

Impact INFRA-1: Portions of the sanitary sewer conveyance system between Ames Research Center and the SWPCP are already flowing at or near maximum capacity. Under Alternatives 2 through 5, discharge from the development proposed under the NADP would contribute to the existing capacity problems.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure INFRA-1: NASA would cooperate with the City of Sunnyvale in determining the cumulative impact of existing and proposed development on the sanitary sewer conveyance system between Ames Research Center and the SWPCP. NASA and its partners would contribute their fair share toward construction of conveyance pipes and supporting infrastructure which are determined to be necessary to mitigate the cumulative impact of existing and proposed development.

Impact INFRA-2: Under Alternatives 2, 4 and 5, discharge from the western sanitary sewer system would increase. The capacity of the conveyance system between Ames Research Center and the PARWQCP is not adequate for existing flows.

Applicable to: Alternatives 2, 4 and 5, and Mitigated Alternative 5

Mitigation Measure INFRA-2: New conveyance piping would be installed between the area served by the existing lift station at the Mountain View Golf Course and the PARWQCP, with sufficient capacity to accommodate the total expected flow. This would require the installation of roughly 5,486 meters (18,000 lineal feet) of pipe. Development under the NADP would contribute its fair share to the solution to this existing regional problem.

Impact INFRA-3: Under Alternatives 2, 4 and 5, discharge from Ames Research Center to the PARWQCP would increase. The plant has sufficient capacity to treat the additional flow. However, the flow for all alternatives would exceed what is specified in the 1993 agreement (which was renewed in 1999) between Ames Research Center and the Plant. NASA does not have a current flow capacity agreement with the City of Mountain View or the PARWQCP. However, NASA has a current wastewater discharge permit with PARWQCP.

Applicable to: Alternatives 2, 4 and 5, and Mitigated Alternative 5

Mitigation Measure INFRA-3: The 1993 agreement for flow capacity between the PARWQCP and Ames Research Center and between Mountain View and

Ames Research Center would be amended to address the additional flow expected from the project before commencing any development. The agreement with Mountain View would include trigger amounts and a formula for the fair share as identified in INFRA-2.

D. Storm Drainage

The following section describes the NADP's potential impacts to the storm drainage system at Ames Research Center.

1. Standards of Significance

An alternative for the NADP would have a significant impact with respect to storm drainage if it would:

- Result in storm runoff that would exceed the capacity of existing receiving bodies.
- Result in storm runoff that exceeds the available off-site conveyance capacity.
- Violate any water quality standards or otherwise substantially degrade surface or ground water quality.
- Interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table.
- Cause substantial soil erosion or loss of topsoil.
- Place housing or other improvements susceptible to flooding within a 100-year flood hazard zone as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard map.

2. Impact Discussion

As described in Section 3.5, ARC currently has two drainage systems. Proposed development under Alternatives 2 through 5 would necessitate the creation of three new drainage systems and the diversion of a portion of one of the existing systems.

Together, there would be a total of six drainage systems draining the six drainage areas shown in Figure 4.5-4.

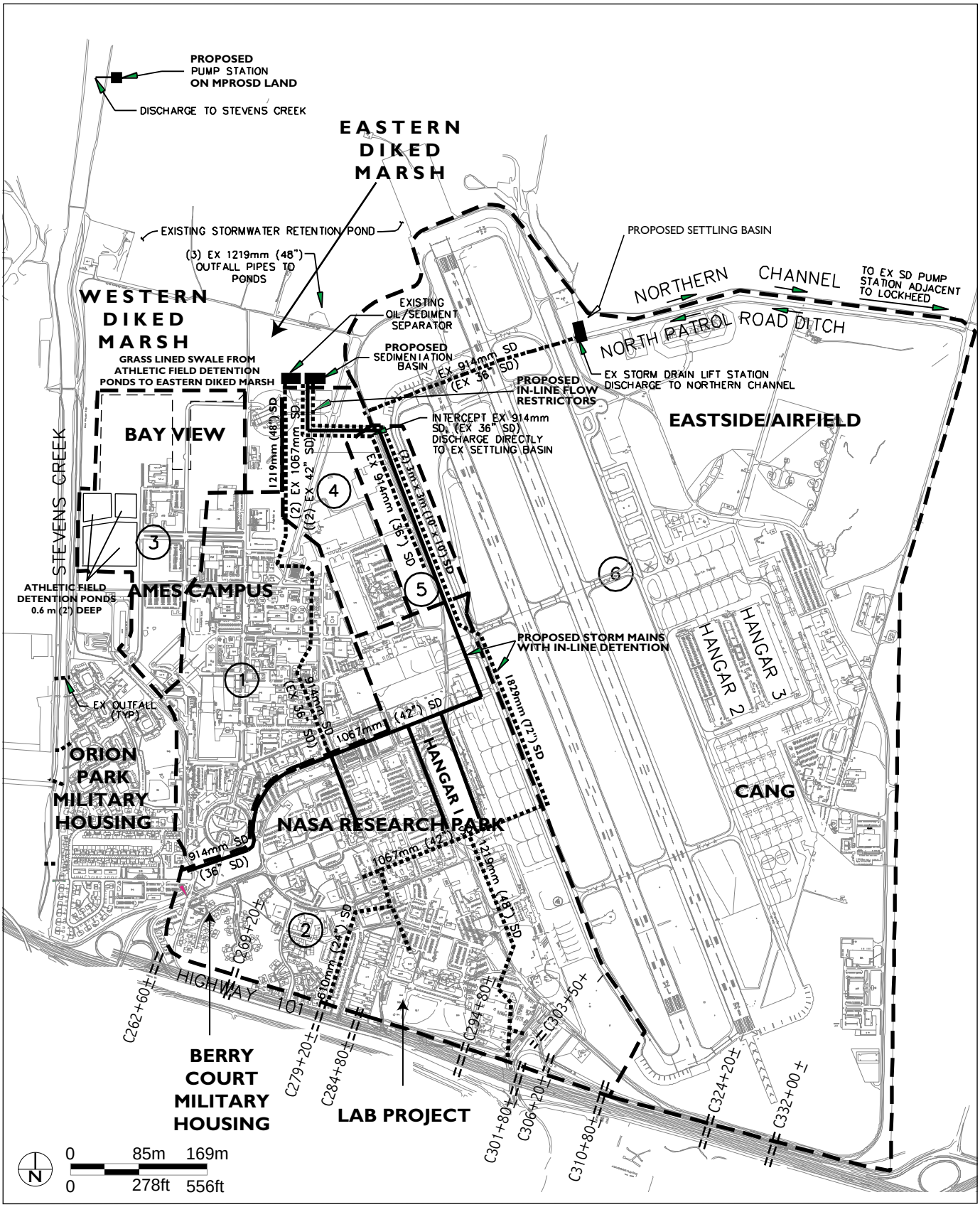
Under each of the alternatives, the amount of impervious area in the ARC would remain essentially unchanged, except in Alternatives 2, 4 and 5, which include development in the Bay View area. Under these alternatives, discharge into Stevens Creek, to the west of Ames Research Center, would increase during periods of low flow in Stevens Creek. However, discharge into Stevens Creek would be suspended during periods of high flow in Stevens Creek and diverted to the Eastern Diked Marsh via the Settlement Basin.

The storm drain design criteria employed in determining the improvements required for new drainage systems are:

- The 10-year storm would be contained in pipes without surcharging.
- The 25-year storm would be contained in pipes with surcharging.
- The 100-year storm would be contained in curbs with no flooding of buildings.
- Additional criteria would include adoption of performance standards, Best Management Practices and Standard Operating Procedures to minimize the runoff, sediment and other contaminants into the storm drain system, potentially reducing off-site flows.

a. Drainage Area 1

Drainage Area 1 is the 61-hectare (150-acre) area that can be drained by the existing storm main located within the Ames Campus with the addition of the proposed parallel discharge pipe to the north of the Ames Campus, assuming that the 10-year storm is contained in the pipes with surcharging. This does not meet the design criteria listed above for new construction. However, designing the new systems adjacent to the Ames Campus area to collect runoff from portions of Ames Campus outside of Drainage Area 1 will reduce the existing drainage problems in the Ames Campus area.



Source: BKF

Caltrans Culvert/Outlet Location

Baseline Storm Drain Mains

Proposed Storm Drain Mains

Drainage Area Boundary

Drainage Area

- (1) 150 Acres
- (2) 320 Acres
- (3) 100 Acres
- (4) 50 Acres
- (5) 30 Acres
- (6) 930 Acres

FIGURE 4.5-4

PROPOSED CONDITIONS STORM DRAIN SYSTEM

NASA AMES RESEARCH CENTER

NASA AMES DEVELOPMENT PLAN FINAL EIS

The storm main that currently serves Drainage Area 1 runs north through the Ames Campus area and discharges into a settling basin just south of the eastern diked marsh. From there, the runoff eventually makes its way into the Storm Water Retention Pond (SWRP) north of the site. The proposed project would add a 1,219 millimeter (48-inch) pipe parallel to the existing storm mains to the north of the Ames Campus. This would reduce flooding in the northern portion of the Ames Campus while minimizing the flow to be redirected to the Bay View area (Drainage Area 3). The new pipes would discharge to the existing settling basin. The proposed project would decrease the runoff entering Ames Campus and would not impact the collection system serving this area. The existing system for discharging excess water from the SWRP into Stevens Creek utilizes mobile pumps that are brought out when the northern portion of the Ames Campus area threatens to flood. A permanent pump station with a more sophisticated operating system could be installed to provide more effective use of the SWRP to control flooding in this area. NASA would work with the Midpeninsula Regional Open Space District to determine the feasibility and location of such a facility and to obtain permission from MROSD to locate a pump on their lands. This would also benefit Drainage Areas 2, 3, 4 and 5 by making more storage volume available in the SWRP during periods of intense runoff.

The proposed permanent pump station could be integrated with the proposed storm drain system and the water level in Stevens Creek, maintaining the hydrologic conditions required for the health of the wetland and the SWRP. Immediately preceding a major storm event, the SWRP could be pumped down to the lowest level determined to be acceptable for short term conditions. As runoff from Ames Research Center began flowing into the SWRP, the pump station could continue to discharge into Stevens Creek until the water in the creek reached a cutoff level agreed upon with Santa Clara Valley Water District. The pump could then shut off until the water level in Stevens Creek began to subside. At that point, pumping could be resumed until the water in the SWRP reached the ideal level agreed upon with the Midpeninsula Regional Open Space District, where it could remain until the next major storm event. This system would relieve flooding in the northern part of Ames Campus and improve the proper operation of the proposed storm drain systems for Bay View and NASA Research Park.

If MROSD does not want the pump on their lands, NASA would locate the pump further east, in NASA's portion of the storm water retention pond. It is possible that the Navy, as part of Site 25 remediation, could construct a berm to separate the portions of the SWRP that are owned by MROSD and NASA. If so, NASA would locate the pump in the NASA portion of the SWRP.

b. Drainage Area 2

Drainage Area 2 is the 129-hectare (320-acre) area comprising the southeast corner of the Ames Campus area, the Berry Court housing area, and the NRP area. Drainage Area 2 generally drains to the north and into the same storm main that serves Drainage Area 1, exacerbating flooding problems in the Ames Campus area. Two 1,067 mm (42-inch) main lines would be installed to intercept runoff from Drainage Area 2 before it enters Drainage Area 1. One of these would be installed under baseline conditions (Alternative 1), and a second would be added under Alternatives 2, 3, 4 and 5. Both interceptors would be extended east past the West Parallel in the airfield,[2] then north along the western edge of the airfield into a new settling basin adjacent to the existing settling basin that serves Drainage Area 1. The proposed system will have adequate capacity to accommodate the runoff from the Caltrans right-of-way south of the project area without impeding the discharge from the existing draingage structures.

Development under the NADP would not notably increase the impervious surface in this area under any of the alternatives, and therefore would not increase the amount of discharge into the SWRP to the north. However, additional elements described below would allow the proposed improvements to the storm drain system to be implemented without increasing the peak discharge to the SWRP.

In order not to exceed the existing peak discharge to the SWRP, NASA would investigate the use of decentralized detention elements such as green roofs, grass lined swales for roof water runoff, and possibly permeable pavements to aid in achieving no net increase in peak discharge to the SWRP. In addition, structural flow

[2] The West Parallel is the dividing line for drainage on the western side of the airfield, as shown in Figure 3.5-4.

restrictors could be installed in the parallel mains running north along the airfield and the pipes could be sized to provide in line detention.

c. Drainage Area 3

Drainage Area 3 is the 40-hectare (100-acre) area comprising the Bay View area and the western portion of the Ames Campus area. The western portion of the Ames Campus area currently drains to the storm main that runs north through the central portion of the Ames Campus area, which does not have adequate capacity, as described in Section 3.5. The result is that excess runoff from the western portion of the Ames Campus area currently flows north into the Bay View area, which is relatively low lying, and thus able to detain a significant volume of runoff. Currently, this runoff discharges into the western diked marsh after passing through the filtration provided by the vegetation in the Bay View area. Proposed development in the Bay View area would increase the impervious surface there, producing more runoff within its boundaries.

In order not to exceed the existing peak discharge to the SWRP and control discharge into the western diked marsh, the athletic fields located in Bay View would be designed to serve as a detention pond during periods of peak runoff. The pond would discharge to a gently sloping grass lined swale in the buffer zone surrounding Bay View, which would discharge via the existing settling basin into the eastern diked marsh. This system would also provide filtration for the storm water. A certain amount of discharge from the pond would be directed into the western diked marsh in order to maintain the existing drainage conditions. NASA would investigate the use of decentralized detention elements such as green roofs, grass lined swales for roof water runoff, and possibly permeable pavements to aid in achieving no net increase in peak discharge to the SWRP.

In order to prevent flooding of the Bay View development, fill would be used to bring the finished grade up to 2 meters (7 feet) along the northern edge of the Bay View area, and slope upward to the south to conform to the existing ground at higher elevations. This would require fill to be placed over a 102,000 square meter (1,100,000 square foot) area with fill ranging in depth from 0.15 meter (0.5 feet) to

1.4 meters (4.5 feet), with an average depth of 1.2 meters (4.0 feet). The total volume of fill required would be approximately 123,000 cubic meters (160,000 cubic yards).

The new storm drain system in the Bay View area would be designed to accommodate excess runoff from the western portion of the Ames Campus area in addition to runoff from the Bay View area itself.

d. Drainage Area 4

Drainage Area 4 is the 20-hectare (50-acre) area comprising the northeast portion of the Ames Campus and an undeveloped area just to the north of it. This part of the Ames Campus area is designed to drain either to the storm main that runs north through the central portion of the Ames Campus area, or to the existing 914 mm (36-inch) storm main that runs north along the west edge of the airfield, neither of which currently has adequate capacity. To relieve these two existing mains, runoff from Drainage Area 4 would be collected in a separate pipe system and discharge into the settling basin and from there into the eastern diked marsh, or would discharge into the extension of the existing 914 mm (36-inch) storm main, which would be properly sized to accommodate the flow.

e. Drainage Area 5

Drainage Area 5 is the 12-hectare (30-acre) area comprising the northeast portion of the Ames Campus area. This part of the Ames Campus area drains to the existing 914 mm (36-inch) storm main that runs north along the west edge of the airfield. Implementation of the improvements recommended for Drainage Area 2 to the south and Drainage Area 4 to the west would allow the existing 914 mm (36-inch) storm main to properly serve the 12 hectares (30 acres) in Drainage Area 5.

f. Drainage Area 6

Drainage Area 6 is the 376-hectare (930-acre) area comprising all of the land east of the western edge of the airfield in the Eastside/Airfield area, including the California Air National Guard (CANG) area. The northern portion of the Eastside/Airfield area currently drains to the north via scattered drainage improvements and random overland flow. Runoff from Drainage Area 6 ultimately makes its way to the existing Ames Research Center storm drain lift station in the northeast area of the

airfield. The capacity of the lift station, which is almost doubled by two portable pumps, is not adequate to eliminate flooding in the northern portion of the Eastside/Airfield area during extremely wet winters. The existing condition would not be affected by any of the proposed alternatives. No changes are proposed.

A settling basin is planned to be installed just to the west of the storm drain lift station (Building 191) to treat surface water and storm water drainage discharge. The installation of this storm water appurtenance would allow for an increase in water quality prior to being pumped from Building 191 into the Northern Channel. The storm drain discharge leaving Ames Research Center via the Northern Channel would not increase due to the development proposed under the NADP.

3. Impacts and Mitigation Measures

Since there are no significant impacts to storm drainage, no mitigation measures are needed.

E. Electric Service

The following section describes the NADP's potential impacts to the electric system at Ames Research Center.

1. Standards of Significance

An alternative for the NADP would have a significant impact with respect to electrical service if it would:

- Create a demonstrable need for new or enlarged energy facilities.
- Place a demand on existing electrical distribution facilities that exceeds available conveyance capacity to Ames Research Center.
- Interfere with provision of electrical service to existing off-site land uses.

2. Impact Discussion

As noted in Section 3.5, Ames Research Center is served by two 115kV electrical substations, the Ames Research Center (ARC) Substation which is centrally located in the Ames Campus, and the Eastside/Airfield (Airfield) Substation which is northeast of Hangar 3. Existing and proposed electric systems are shown in Figure 4.5-5.

a. Electricity Supply

Recently, electrical generating capacity statewide has not been able to keep up with demand. The financial and regulatory issues that have created this situation affect the entire State of California, and not just the proposed project. The resolution of these issues will take time, and will occur through some combination of conservation and construction of new generating capacity. At this time, it is impossible to predict how much of a shortfall in electrical power will occur over the next few years, how this shortfall might affect the project, how the project might exacerbate electrical shortfalls, or how these issues will be addressed. However, it currently appears that the electricity supply situation is improving. Before the improvements proposed by the NADP are complete, it is expected that construction of new power plants will provide adequate power for the project.

The sustainable design provisions of the NASA Research Park Design Guide for development at Ames Research Center emphasize the installation of energy efficient building systems and controls, energy conservation, and the utilization of solar and other renewable energy resources. Implementation of these provisions would minimize electricity consumption and avoid any significant impact relative to electricity use.

b. Electricity Conveyance to Ames Research Center

The regional system operated by PG&E and the 115kV transmission lines that serve Ames Research Center have adequate capacity to accommodate the increased demand for electricity that would result from the proposed development.

c. On-Site Improvements

Development under the NADP would require a number of improvements to the on-site electrical system. The main features of the proposed electrical system is shown diagrammatically on Figure 4.5-5. The ARC Substation would continue to serve the Ames Campus and, because it would be the primary source of power for Switchgear C in the NRP area, it would serve the runway lighting and potentially the two Military Housing areas. This substation would provide power to the Bay View and NRP areas as well. (The Army is working with PG&E to provide power to the Military Housing from the PG&E substation at Whisman.)

3. Impacts and Mitigation Measures

There are no significant electric impacts. Therefore, no mitigation measures would be required.

F. Natural Gas Service

The following section describes the NADP's potential impacts to the natural gas system at Ames Research Center.

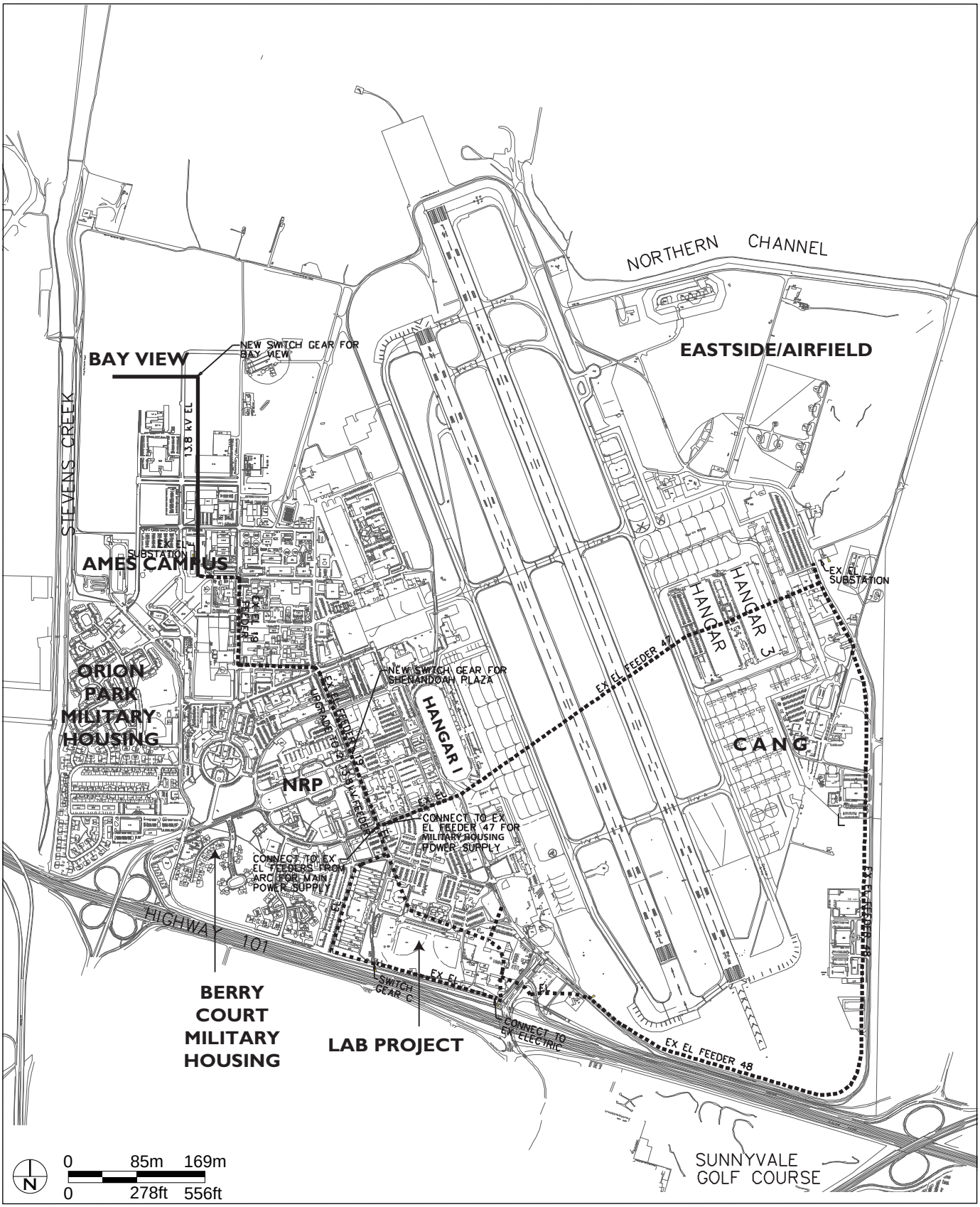
1. Standards of Significance

An alternative for the NADP would have a significant impact with respect to natural gas service if it would:

- Create a demonstrable need for new or enlarged energy facilities.
- Place a demand on existing off-site gas distribution facilities that exceeds available conveyance capacity.
- Interfere with provision of gas service to existing off-site land uses.

2. Impact Discussion

Development under the NADP would use additional natural gas. Table 4.5-9 presents the gas demands for the different alternatives and development areas.



Source: BKF

Baseline Electric Service Feeders .....

Proposed Electric Service Feeders ——

FIGURE 4.5-5

PROPOSED CONDITIONS ELECTRIC SYSTEM

TABLE 4.5-9 **GAS DEMANDS**

Development	Peak Gas Demand giga-joules per year (kilo-Therms per year) Alternatives 1	2	3	4	5	Mit.5*
NRP	121,859 (1,555)	270,306 (2,562)	342,578 (3,247)	232,641 (2,205)	268,935 (2,549)	291,619 (2,764)
Bay View	0	97,910 (928)	0	203,416 (1,928)	92,107 (873)	121,965 (1,156)
Eastside/Airfield	30,175 (286)	79,130 (750)	39,143 (371)	87,675 (831)	30,913 (293)	30,913 (293)
Ames Campus	304,912 (2,890)	304,912 (2,890)	304,912 (2,890)	304,912 (2,890)	340,257 (3,225)	340,257 (3,225)
Total	456,946 (4,331)	752,258 (7,130)	686,633 (6,508)	828,644 (7,854)	732,212 (6,940)	784,754 (7,438)

* For details see Section 5.5

Proposed development under the NADP would require the installation of new gas distribution piping within the NRP and Bay View areas. The high pressure gas mains that serve Ames Research Center have adequate capacity to accommodate the increased demand for gas that would result from the proposed development.

With regard to regional gas supply, increased demand for natural gas under the NADP would constitute a less-than-significant impact. Gas supply would be sufficient to meet the demands noted in Table 4.5-9.

Recently, delivery of natural gas in California has been limited at times but the availability of this resource is not threatened. Resolution of the financial and regulatory issues facing the greater San Francisco Bay Area and the State of

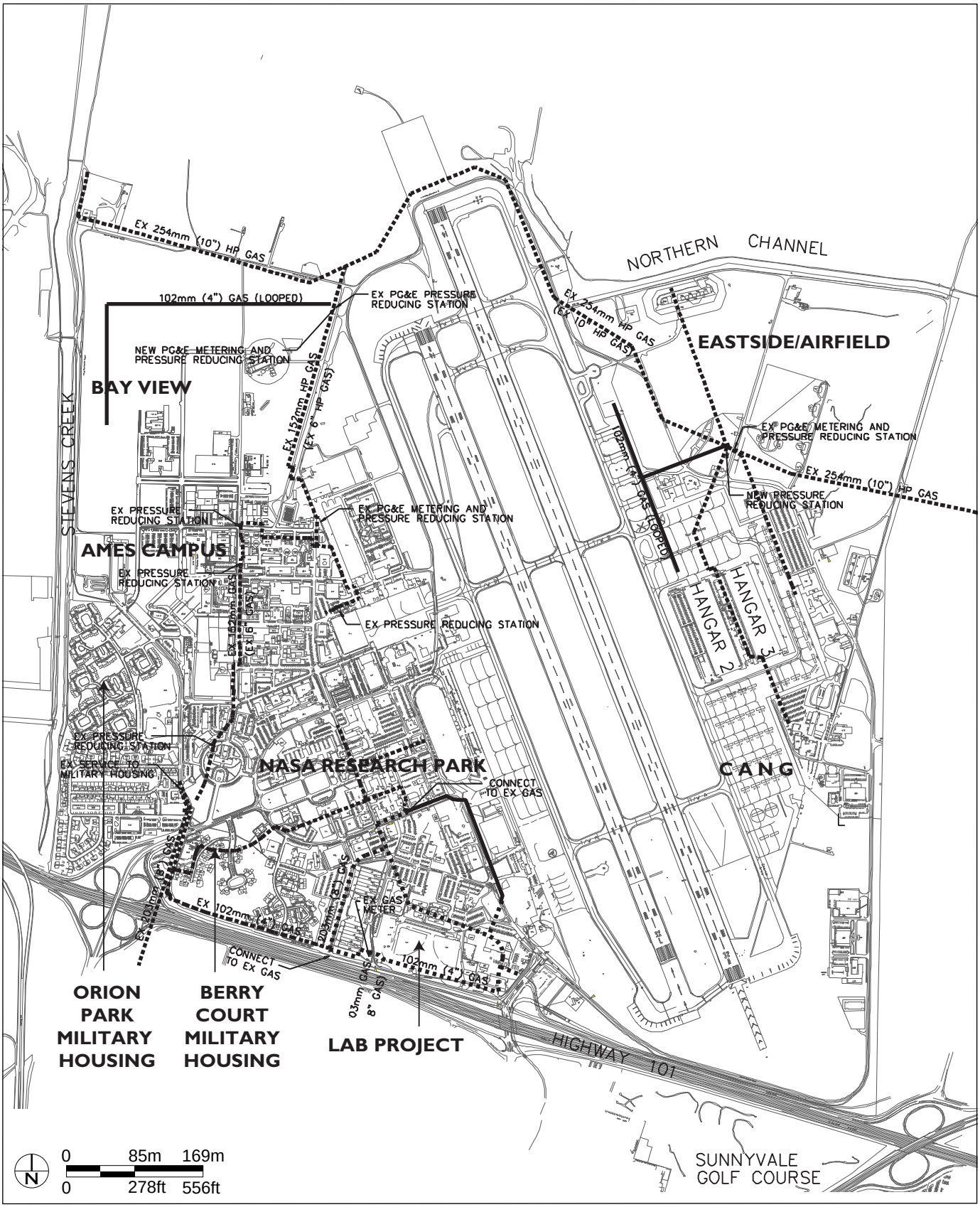
California will result in a sufficient supply of natural gas to serve any of the alternatives. There is no significant impact anticipated with regard to natural gas supply.

Furthermore, the sustainable design provisions of the NASA Research Park Design Guide for development at Ames Research Center emphasize the installation of energy efficient building systems and controls, energy conservation, and the utilization of solar and other renewable energy resources. Implementation of these provisions would mitigate any regional impact of development under the NADP.

Existing and proposed gas systems are shown in Figure 4.5-6.

3. Impacts and Mitigation Measures

There are no significant natural gas impacts. Therefore, no mitigation measures would be required.



Source: BKF

Baseline Gas Mains .....

Proposed Gas Mains ———

FIGURE 4.5-6

PROPOSED CONDITIONS GAS SYSTEM

4.6 SERVICES

This section identifies potential impacts on the provision of services within Ames Research Center from each of the five alternatives, and proposes mitigation measures to reduce or eliminate identified impacts.

A. Standards of Significance

An alternative for the NASA Ames Development Plan (NADP) would have a significant impact with regard to the provision of services if it would:

- Create a demand for solid waste disposal that exceeds the capacity of the landfill site currently used for Ames Research Center's waste products.
- Exceed the student capacity of existing schools.
- Create a demand for police or fire services that cannot be met using NASA's resources.

B. Impact Discussion

Under Alternatives 2 through 5, the baseline population of Ames Research Center and the square footage of facilities would be expected to increase. The increase in population would vary from a low of 1,267 new residents under Alternative 3 to a high of 2,808 new residents under Alternative 5. The increase in employment would vary from a low of 7,222 new employees under Alternative 5 to a high of 15,599 new employees under Alternative 4. Similarly, the amount of net new development would vary among the five alternatives from a low of approximately 280,000 new square meters (3.0 million new square feet) under Alternative 3 to a high of approximately 455,000 new square meters (5.0 million new square feet) under Alternative 4. This section describes potential impacts from the potential increases in population and building square footage on the provision of basic services at Ames Research Center.

1. Fire

As described in Section 3.6, above, fire protection at Ames Research Center is provided by NASA and supplemented by the Santa Clara County Fire Mutual Aid service. Existing levels of fire protection would not be adequate to support the increase in population and square footage proposed under the action alternatives. However, NASA has committed to increasing the number of personnel and amount of equipment available for emergency fire response at Ames Research Center to the levels required to serve development under the NADP, which would prevent a potential impact.

Since there would be no demands on outside fire services, there would also be no potential for the NADP to combine with cumulative projects to create cumulative fire service impacts.

2. Police

Security services at Ames Research Center are provided by the ARC Protective Services Office, Security Services Branch. The Security Services Branch would continue to provide police services throughout Ames Research Center, and their patrols would be increased as necessary to serve new development under the NADP. The Security Services Branch would not provide internal security for non-federal entities, however, so the university, non-profit, and private groups moving into Ames Research Center would be responsible for establishing their own internal security service.

Current levels of security are not sufficient to provide coverage for the expanded population foreseen under the NADP. However, NASA foresees no problems in expanding services to the needed levels. No demands on city or county police services would occur.

Since there would be no demands on outside police services, there would also be no potential for the NADP to combine with cumulative projects to create cumulative police service impacts.

3. Solid Waste

Using the population numbers from Alternative 5 and employment numbers from Alternative 4 in order to conduct a conservative analysis of solid waste impacts under the NADP, the amount of new waste generated would be approximately 6 million kilograms (6,600 tons per year).[1] This would increase to 6,331 tonnes (6,950 tons) per year under Mitigated Alternative 5.[2] This estimate is based on assumptions of 2.0 kilograms (4.5 pounds) of waste per person per day in residential units, and 1.02 kilograms (2.25 pounds) of waste per employee per day. This would be a small fraction of the 820 million kilograms (900,000 tons) per year of waste that the Newby Island Landfill receives, and so would not significantly hasten the forecasted close of that landfill in 2020. Thus there would be no impact on regional solid waste disposal from implementation of the NADP.

The NASA Ames Research Center is committed to reducing the volume of solid and hazardous waste generated annually through source reduction and recycling. The current Agency-wide goal is to divert 35 percent of solid waste away from landfills by 2010 compared with the 1997 baseline. However, Ames is committed to a more aggressive program and has achieved a 63% diversion from landfill. Ames has also promulgated guidelines for the purchase of a variety of recycled contents materials from paper products to vehicular products. In addition, Ames has set up a complex system of accountability and reporting to ensure that at least the following items are being recycled wherever feasible: white paper, cardboard, scrap metal, wood and steel. Ames is also committed to purchasing products with recycled or recovered materials content in the percentages specified by the current Federal EPA Guidelines. These programs would further minimize solid waste impacts of the alternatives.

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[1] Based on information provided by the Franklin Associates *Characterization of Municipal Solid Waste in the United States, 1998 Update*. July, 1999.

[2] See Section 5.6 for more details.

Some of the items ARC is currently recycling include white paper, mixed paper, cardboard, toner cartridges, various types of batteries, fluorescent lamps, certain solvents, waste oil, oil filters, scrap metal and empty drums, tires, and computers. Ames also realizes reductions in solid waste through reduced paper usage, which is achieved by double-sided printing and copying and by electronic distribution of documents. A benchmarking project recycling plastics, glass and aluminum cans is scheduled to begin in early 2002, followed by full implementation in 2003.[3] Ames further reduces solid waste by composting or making into mulch all landscaping green waste. Ames keeps the mulch and compost on-site for further landscaping use. These programs would apply to all new development under the NADP.

Ames continues to find ways to reduce the solid waste that goes to landfill through the expansion of its recycling, composting and green purchasing programs. Continual improvements in these programs are expected to yield additional reductions in solid waste disposal.

Like the NADP, the cumulative projects listed in Chapter 2 would also generate additional solid waste, which would be sent to the Newby Island Landfill. Calculations of the projected closure date for this landfill include an allowance for cumulative projects listed in Chapter 2, so no additional impact from cumulative projects is expected.

4. Schools

Potential numbers of elementary and high school students in the proposed housing have been estimated using the number of new townhome and apartment units. As shown in Table 4.14-11 in Section 4.14, the number of students generated would range from a low of 40 K-8 students and 11 high school students under Alternative 3, to a high of 102 K-8 students and 28 high school students under Alternative 4. Alternative 4, the alternative that would

[3] Diane Shelander, Ames Research Center, March 6, 2002.

generate the highest number of students, was used as the basis for this impacts analysis.

a. Mountain View and Whisman School Districts

As described in Section 3.6, above, children at Ames Research Center would attend school in the Mountain View-Whisman School District, which serves children from kindergarten through eighth grade. The surplus capacity in the Mountain View-Whisman School District as of Fall 2001 could accommodate 23 students. Although Mitigated Alternative 5 would exceed the District's surplus capacity by 125 students, development under the NADP would also pay school Developer Impact Fees that would be used by the Mountain View-Whisman School District to build new classrooms and other necessary facilities. As noted in Table 4.14-12, fees of $541,000 to $1.7 million would be expected under Alternatives 2, 4, 5 and Mitigated Alternative 5.

Table 4.6-1 contains a comparison of the additional facilities cost generated by the students in excess of the District's current capacity and the revenue from the Developer Impact Fee. The analysis uses Mitigated Alternative 5, the NADP alternative generating the greatest number of elementary students, as a basis for the comparison. According to this calculation, the Developer Impact Fee would generate a surplus of $11,710 above the facilities cost. Therefore, no significant impact would occur.

b. Mountain View-Los Altos Union High School District

High School-age students living at Ames Research Center would attend schools in the Mountain View-Los Altos Union High School District. As of October 2001, Los Altos High School was 121 students under capacity. This would allow more than enough space for the 11 to 40 high school students that the area would be expected from implementation of the NADP.

c. Cumulative Impacts

The cumulative projects identified in Chapter 2 are primarily employment generating, with relatively few residential projects. The cumulative projects

TABLE 4.6-1 **MOUNTAIN VIEW-WHISMAN SCHOOL DISTRICT FACILITIES IMPACT ESTIMATE**

ADDITIONAL STUDENTS		Students	Classrooms (a)
Projected Additional Mountain View-Whisman School District Students (b) (Net of current excess capacity in the District)		125	7
FACILITY COSTS PER ADDITIONAL CLASSROOM (c)			
Classrooms	$160,000		
Core Facilities	$57,600		
Restroom Facilities	$24,000		
Total	**$241,600**		
FACILITIES IMPACT			
NADP Developer Impact Fee (d)	$1,702,910		
Additional Facilities Cost	$1,691,200		
Surplus/(Deficit)	**$11,710**		

Notes:
(a) Students per classroom: 19.8 Based on the average classroom size in Mountain View School District in 1999. Number of classrooms rounded up to nearest whole number.
(b) Mitigated Alternative 5 generates the greatest number of elementary students at 148. As of Fall 2001, the District had excess capacity for 23 students.
(c) Cost assumptions from Mountain View School District Developer Impact Fee Justification Study, 1999. Assumes additional classrooms will be built on existing school property due to high cost and low availability of land in Mountain View. Cost of additional classrooms assumes half are permanent and half are portable, per Mountain View School District Developer Impact Fee Justification Study, 1999.
(d) From Table 4.14-12. Developer Impact Fee generated by Mitigated Alternative 5.

Source: Schoolhouse Services; Mountain View-Whisman School District; Bay Area Economics, 2002.

include 275 additional residential units in Mountain View, which would generate 36 elementary school students and 10 high school students.

These additional elementary school students from cumulative projects exceed the current capacity of the Mountain View-Whisman School District. This impact would be mitigated through the payment of standard developer impact fees by both residential and commercial development.

The additional high school students from cumulative projects could be accommodated in the Mountain View-Los Altos Union High School District.

C. Impacts and Mitigation Measures

This section summarizes significant impacts identified in Section B, and proposes mitigation measures for each identified impact.

Impact SERV-1: Under Alternatives 2, 4 and 5, and Mitigated Alternative 5, housing development in the Bay View Area would result in an increase in elementary school students that would impact the Mountain View-Whisman School District.

Applicable to: Alternatives 2, 4, 5 and Mitigated Alternative 5

Mitigation Measure SERV-1: The NADP housing developers would pay the standard Developer Impact Fees to the Mountain View-Whisman School District.

4.7 HAZARDOUS MATERIALS, SITE CONTAMINATION AND POLLUTION PREVENTION

This section identifies potential impacts from hazardous materials and site contamination from each of the four action alternatives, and proposes mitigation measures to reduce or eliminate identified impacts.

A. Standards of Significance

An alternative for the NASA Ames Development Plan (NADP) would have a significant impact with regard to hazardous materials and site contamination if it would:

- Hamper on-going, planned or needed remediation at Ames Research Center.
- Expose people or currently uncontaminated soil or water to unacceptable levels of existing contamination through construction, demolition, or other activities.
- Result in unacceptable handling, use or disposal of hazardous materials.

B. Impact Discussion

This section discusses potential impacts from hazardous materials and site contamination for each of the five proposed alternatives. Additional information on impacts related to toxic air contaminants is contained in Section 4.4 of this EIS.

1. Remediation at Ames Research Center

As noted in Section 3.7, the US Navy's occupation of Moffett Field left a legacy of site contamination, primarily from petroleum products and solvents. NASA has also created some contamination on the Ames Campus. The plume of groundwater contamination from the MEW Superfund site, which is south of Ames Research Center, has also spread under a substantial portion of the NRP and part of the Ames Campus areas. Remediation efforts are thus a crucial part of the responsible stewardship of Ames Research Center, and must be

facilitated wherever possible. New development associated with the NADP must not hamper on-going or future remediation efforts.

Under each of the alternatives, the existing street and building site layout in the NRP area would be substantially altered, which could lead to conflicts with existing piping and monitoring wells. If any changes to the remediation system were necessary, the Navy's or MEW Companies' contractors would complete, at the project developer's expense, the design and implementation. Changes could include closure of existing groundwater wells, development of new wells, and relocation of pipelines or other system components. The project developer would work with the Navy's and MEW Companies' contractors to coordinate the schedule for completion of EPA- and Regional Water Quality Control Board-approved remediation with the developer's construction schedule.

Under Alternatives 1 through 5, portions of the existing pipe system for the remediation of the Regional Plume would be reconfigured to accommodate new construction in order to allow full access to these pipes. In addition, NASA and developers in the NRP area would site new buildings so as to interfere with existing monitoring wells to the minimum extent possible. If monitoring wells did need to be relocated, NASA and the developer would work with the Navy, the MEW Companies, the Regional Water Quality Control Board, and US EPA to determine the best new location for the well. The actual relocation of MEW wells would be conducted by the MEW's contractor at the expense of the developer. For Navy wells, the developer would contract directly with the Navy's contractor for needed relocations. This work, and proposed construction and demolition throughout Ames Research Center, would be coordinated through the Remediation Project Manager in the Office of Environmental Services to ensure that none of the proposed construction, demolition, and infrastructure improvement projects hampered any of the on-going, planned, and foreseeable remediation efforts at the ARC.

2. Exposure to Existing Contamination

This section describes potential exposure to existing sources of contamination at Ames Research Center.

a. Asbestos, Lead, PCBs and Mold

Under Alternatives 2 through 5, there would be a risk of exposing construction workers to asbestos, lead, or PCBs as existing buildings were rehabilitated or demolished, since most buildings constructed before 1978 are likely to contain asbestos containing materials (ACMs), lead-based paints, and/or PCB's. As per current NASA policy, an ACM/lead/PCB survey would be conducted on all buildings and structures prior to demolition or rehabilitation to confirm that ACM/lead/PCB concentrations were not above regulatory limits. If any ACM materials, lead, or PCBs were discovered at concentrations above the regulatory limits, US EPA, BAAQMD, DTSC, and OSHA requirements would be implemented to ensure containment during demolition and rehabilitation. NASA has prepared a draft plan for meeting agency remediation requirements for lead in the soil.

NASA is also preparing Closure Plans for the buildings to be demolished in the NRP area under Alternatives 2 through 5 to document levels of contamination before demolition begins. In addition to information about contamination from the Regional Plume, the Closure documents will describe PCBs and other hazardous materials, as well as any residual soil contamination from sumps, tanks, etc. Results of lead and asbestos surveys will be documented separately. As part of the Closure Plan process, any needed sampling to more accurately assess the level and extent of contamination in the buildings to be demolished and their immediate surroundings will be conducted. The Closure Report, the final step in this process, will be prepared after buildings are demolished and will describe how all hazardous materials have been safely disposed of or remediated.

Lastly, there is a possibility that construction workers renovating some of the historic buildings in the Shenandoah Plaza Historic District could be exposed

to mold that could cause health problems. There are no health standards or regulations for mold and related biological indoor air quality concerns.[1] However, NASA has developed procedures to minimize exposure to mold during renovation work. These procedures would be followed.

b. Pesticides

As described in Section 3.7, recent soil samples from the Bay View area have found the pesticide dieldren in concentrations above risk-based soil screening levels. Dieldren is not volatile so the only risk of exposure would be from physical contact with or ingestion of contaminated soil. In most areas, it would be sufficient to cover the contaminated soil with a layer of clean fill, as is already planned to bring the surface elevation in the Bay View area safely above the 100-year flood plain. Under Alternatives 2, 4 and 5, there would be housing and childcare in the Bay View area. NASA is currently conducting a Human Health Risk Assessment to predict site specific risk for exposure to dieldren, arsenic, and chromium.

As needed, where there is a possibility of children digging down through the layer of clean fill, a protective membrane would be installed to prevent it.

c. Navy, NASA, and MEW Companies Contaminants

As described in Section 3.7, a portion of the NRP and Ames Campus is located over the Regional Plume, a plume of groundwater contaminated with solvents and petroleum products. There are also a number of sites within the four planning areas known to be contaminated with hazardous materials. There would thus be a risk of exposing people or uncontaminated soil and groundwater to contamination through construction or demolition activities associated with the implementation of the NADP and through inhalation of vapors emanating from the Regional Plume. In addition, although Ames Research Center has been extensively tested for contamination, there would be

[1] Louise Hill. Indoor Environmental Program, EPA Region 9. May 24, 2001.

a possibility that new construction and demolition could expose previously unknown contamination.

Exposure to any of these hazardous materials above acceptable risk levels would be considered a significant impact. In order to evaluate this risk, NASA prepared a Human Health Risk Assessment (HHRA) to evaluate potential human health effects from possible exposure to hazardous chemicals in groundwater and soil from the Regional Plume, based on current and planned future land uses in the NRP area. Modeling of volatilization of contaminants from the groundwater, surface flux measurements, and direct measurements of volatile compounds in the air were used as the basis for evaluating the risk resulting from potential 10-year and 30-year exposure to inhalation of volatile organic chemicals (VOCs). The HHRA uses risk isoplasts to evaluate potential health risks to indoor workers, construction workers, outdoor maintenance workers, outdoor maintenance workers, students, visitors, adult residents, child residents, and children at childcare. The risk goal is 10^{-6} for the entire Ames Research Center.

The HHRA describes risks to a number of potential receptors from a variety of exposure pathways. Potential receptors are members of a population who may be exposed to contaminated soil, groundwater, or air during the course of daily living and working in areas over the plume. Up to eight receptors were evaluated for each area, depending on planned land uses: indoor workers, construction workers, outdoor maintenance workers, students, visitors, adult residents, child residents, and children at daycare. Potential receptors could be exposed to chemicals of potential concern by one or more of the following pathways: inhalation of volatile chemicals from groundwater and/or soil, inhalation of airborne suspended soil particles, incidental soil ingestion, and dermal absorption due to direct soil and/or groundwater contact. In general, the HHRA finds that most risks are below or within the EPA risk management range.

To address the risks associated with site contamination, NASA has prepared an Environmental Issue Management Plan (EIMP) that addresses potential hazardous materials exposure issues. The Final EIMP will be available in Fall 2002. The EIMP includes a set of minimum health and safety guidelines that must be followed by any developer at Ames Research Center to protect worker safety. The EIMP also includes land use guidelines based on the HHRA, as well as recommended construction practices to minimize exposure of on-site personnel to existing contaminants. Another key section of the EIMP describes mitigation measures to prevent the creation of horizontal or vertical conduits for the flow of contaminated groundwater. These measures apply to all utilities installed within 2 feet of the seasonal high elevation of the groundwater table or in areas with VOCs in the groundwater. The EIMP also outlines a process for removing existing utilities in order to prevent their becoming conduits for contaminated groundwater.

In addition, the EIMP includes a contingency plan for testing and treatment of any materials encountered during grading and digging operations that are suspected to be hazardous. The contingency plan includes sampling and assessment of results by a qualified individual to determine whether materials are actually hazardous. The EIMP is being reviewed by a number of local, State and federal agencies including the Environmental Protection Agency and the Regional Water Quality Control Board. Once the EIMP is approved, NASA, the MEW Companies, the Navy, and NASA's development partners will implement its recommendations and guidelines.

3. Hazardous Materials

Because Ames Research Center is home to a large number of research and development projects, many different hazardous substances are used there. As described in Section 3.7, at any given time there may be more than 5,000 types of toxic substances in the laboratories at Ames Research Center. NASA has an environmental management system that includes procedures and guidelines

(APG 8800.3) to control the hazards associated with toxic substances and to minimize the risks of exposure or spills.[2]

Under Alternatives 2 through 5, there would be new research and development uses that could include laboratories in either new or existing buildings where hazardous or radioactive materials could be utilized. New laboratory space could cause a significant impact if hazardous or radioactive materials were used or disposed of in a manner inconsistent with existing NASA protocols, or if these materials were not properly considered in Center-wide contingency plans.

In order to prevent significant impacts from the handling, use or disposal of hazardous or radioactive materials in the new laboratory space within Ames Research Center, new users (including non-NASA entities) would be required to follow all existing NASA protocols for dealing with such materials. In addition, NASA would reexamine all of its existing protocols regarding the handling, use and disposal of hazardous and radioactive materials in light of the development of new laboratory space. Specifically, NASA would update contingency plans to include the possibility of incidents within all four planning areas, expand all existing policies as necessary to include measures to address any circumstances unique to one of the planning areas, and expand monitoring and education programs to include researchers working outside of the Ames Campus area.

4. Off-site Adjacent Hazardous Materials

As described in Section 3.7, a portion of the Ames Campus area is located over a plume of contaminated groundwater originating in the adjacent Orion Park Military Housing area. This trichlorethylene-contaminated groundwater plume is migrating north towards Bay View, although it has not yet reached that area. NASA is planning to conduct interim remedial measures to prevent further plume migration. The US Navy is investigating this contamination.

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[2] *Ames Procedures and Guidelines (APG 8800.3) Environmental Management Handbook.*

The Navy, or another upgradient source, is responsible for its remediation. Given these plans, no significant impacts associated with this plume are expected.

Another potential source of off-site contamination is the Mountain View Industrial Park west of and adjacent to the Bay View area. Each of the alternatives includes some space for community facilities, such as childcare facilities, which would be sensitive to exposure. All childcare facilities in Mitigated Alternative 5 would be located at least 0.4 kilometers (1/4 mile) from the industrial area of Mountain View in compliance with City of Mountain View policy. Childcare facilities in Alternatives 2, 4, and 5 would be located at least 305 meters (1,000 feet) from the Mountain View industrial area.

5. Cumulative Impacts

As described above, the only potential hazardous materials and contamination impact of the proposed project would arise from exposure of people or uncontaminated soil or groundwater at Ames Research Center to known or unknown contaminants. Because the only potential impact is on-site and would be mitigated to less-than-significant levels by the implementation of the EIMP, there would be no impacts from the proposed project that could combine with the hazardous materials impacts of other projects in the region to create a cumulative impact.

C. Impacts and Mitigation Measures

This section summarizes significant impacts identified in Section B, and proposes mitigation measures for each identified impact.

Impact HAZ-1: New construction and demolition required to implement the NADP would establish new land uses and could expose the public or uncontaminated soil or water to existing site contamination.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure HAZ-1: NASA's development partners would work with the Remediation Project Manager within the Office of Environmental Services during site planning and would implement the guidelines and recommendations in the Environmental Issues Management Plan (EIMP) to ensure that none of the proposed construction, demolition, and infrastructure improvement projects would expose personnel to unacceptable levels of contaminated soil or groundwater. Where the Remediation Project Manager determined that there would be a possible risk of exposure to people or clean soil or groundwater, the proposed design would be altered to prevent such exposure if feasible. If it were not feasible to avoid exposure, protective measures would be undertaken to minimize the risk of exposure as described in the EIMP.

Impact HAZ-2: Proposed childcare facilities in the Bay View area could be located near the Mountain View Industrial Park, where some businesses handle hazardous materials. Spills or releases at these businesses could expose children to hazardous air pollution. This would be a significant impact.

Applicable to: Alternatives 2, 4, 5 and Mitigated Alternative 5

Mitigation Measure HAZ-2: In Alternatives 2 and 4, NASA or its partners would locate childcare facilities at least 305 meters (1,000 feet) from the industrial area of Mountain View, which would limit the area in which industries handling hazardous materials would be prohibited. Mitigated Alternative 5 would locate childcare facilities at least 402 meters (1,320 feet) from the industrial area of Mountain View in accordance with City of Mountain View policy.

4.8 GEOLOGY

This section identifies potential impacts related to geology, seismic conditions, and soils within Ames Research Center from each of the five alternatives, and proposes mitigation measures to reduce or eliminate identified impacts.

A. Standards of Significance

An alternative for the NASA Ames Development Plan (NADP) would have a significant impact with regard to seismic safety and geology if it would:

- Result in major changes to the topography of Ames Research Center.
- Expose buildings or people to unusually high levels of geotechnical or seismic hazard.

B. Impact Discussion

This section discusses potential impacts on seismic safety and geology from each of the five proposed alternatives. As discussed in Section 3.8 of this EIS, the principal sources of seismic and geotechnical hazards within Ames Research Center are large future earthquakes and ground subsidence. The soils within Ames Research Center also present risks of differential settlement.

1. Topography

As described in Section 3.8 of this EIS, the topography at Ames Research Center is almost entirely flat. The only significant topographical features are the man-made berms along Stevens Creek and the edge of the wetlands in the North of Bay View area.

Under Alternatives 2, 4 and 5, there would be a substantial amount of fill placed in low-lying portions of the Bay View area. As noted in Chapter 2, Section 2.B.2.g, fill would be required to bring the finished grade up to 2 meters (7 feet) along the northern edge of the Bay View area, and to slope the rest of that area upward to the south to conform to the existing ground at higher elevations. This would require fill over a 278,700 square meter

(3,000,000 square foot) area with fill ranging in depth from 0.15 meters to 1.40 meters (0.5 feet to 4.5 feet), with an average depth of 0.6 meters (2.0 feet). The total volume of fill required would be approximately 170,000 cubic meters (220,000 cubic yards). There would also be some minor grading associated with development in all four planning areas. This is not considered a significant impact since all fill would be engineered when placed.

2. Seismic and Other Geotechnical Hazards

There are no known active faults within Ames Research Center, so there is little possibility of ground-surface rupture. However, the Center is located in close proximity to three active faults. Plausible seismic hazards at Ames Research Center thus include ground shaking, liquefaction, differential settlement, and lurch cracking. These are typical conditions within the San Francisco Bay Area.

Clayey soil is generally not considered susceptible to liquefaction, and dense sands have low susceptibility to liquefaction. A few layers of medium dense/medium stiff sandy and silty soils are interspersed within the clayey soil between depths of 4 and 14 meters (13 and 45 feet). In general, these layers are 5 feet in thickness, but can be as thick as 5 meters (17 feet). These sandy and silty layers could potentially liquefy during strong seismic shaking and result in settlement.

Assuming that all proposed new buildings would be founded on either mat foundations or shallow spread footing foundations because of high water table and contamination issues, it is estimated that the maximum total settlement would be less than 3.8 centimeters (1.5 inches), and the differential settlement about 2.5 centimeters (1 inch), at the ground surface after a moderate to strong earthquake.

As described in Section 3.8 of this EIS, ground subsidence due to decreasing groundwater levels is another potential geotechnical hazard at Ames Research Center. In the period between 1932 and 1969, ground subsidence caused the land at the Center to sink between 1.7 and 1.8 meters (5.5 and 6 feet). Due to

an aggressive recharge program implemented by the Santa Clara Valley Water District, groundwater levels have remained fairly stable over the last 30 years, but are still subject to seasonal fluctuations.

The silty clay soil within Ames Research Center presents two potential geotechnical issues, as described in Section 3.8 of this EIS. The soil is very malleable, which can lead to differential settlement around buildings. It also has a strong shrink-swell potential with seasonal fluctuations in moisture, which can stress shallow concrete slabs and pavement and cause cracking and heaving.

Alternatives 2 through 5 propose substantial quantities of new development, and all new buildings would be exposed to ground subsidence, differential settlement, and seismic hazards. This could create a significant impact if improper safety designs were implemented.

NASA and its consultants commissioned a preliminary study of potential safe building heights in the NRP area under known geotechnical conditions, which was completed by Geomatrix. Based on available subsurface information, Geomatrix found that the depth to the soft/medium stiff soil layer varies from 1.5 and 4.6 meters (5 to 15 feet) across the site. For areas where this depth is less than 2 to 3 meters (7 to 10 feet), it might not be appropriate to build higher than three stories and shallow spreading footing or mat foundations would be appropriate only for one- to two-story buildings and for some lightweight three-story buildings. For areas where the depth to soft/medium clay is greater than 3 meters (10 feet), Geomatrix found that buildings up to five stories tall could be supported on a mat foundation. The bottom of the mat foundations should be limited to a depth of 2 meters (5 feet) from the current grade.

More specifically, Geomatrix found that the NRP can be separated into four regions regarding the height of buildings that can be supported on shallow foundations, as shown in Figure 4.8-1.

— **Region 1: west of Bailey Road and south of Wescoat Drive.** Buildings in this area could be five stories high or even higher. However, sufficient subsurface information is not available in this region to be confident about using shallow foundations.

— **Region 2: north of Wescoat Road and south of Bushnell Road.** Buildings 2 to 3 stories high may be appropriate in this region. In the southern part of Region II, it is possible that buildings up to five stories could be supported on shallow foundations. However, there is not sufficient subsurface information available to confirm this.

— **Region 3: east of Bailey Road, south of Wescoat Drive, west of Ellis Street.** Buildings of five stories high would be appropriate in Region III.

— **Region 4: East of Ellis Street.** Buildings of 2 to 3 stories would be appropriate in this region. Buildings five stories high might be possible.

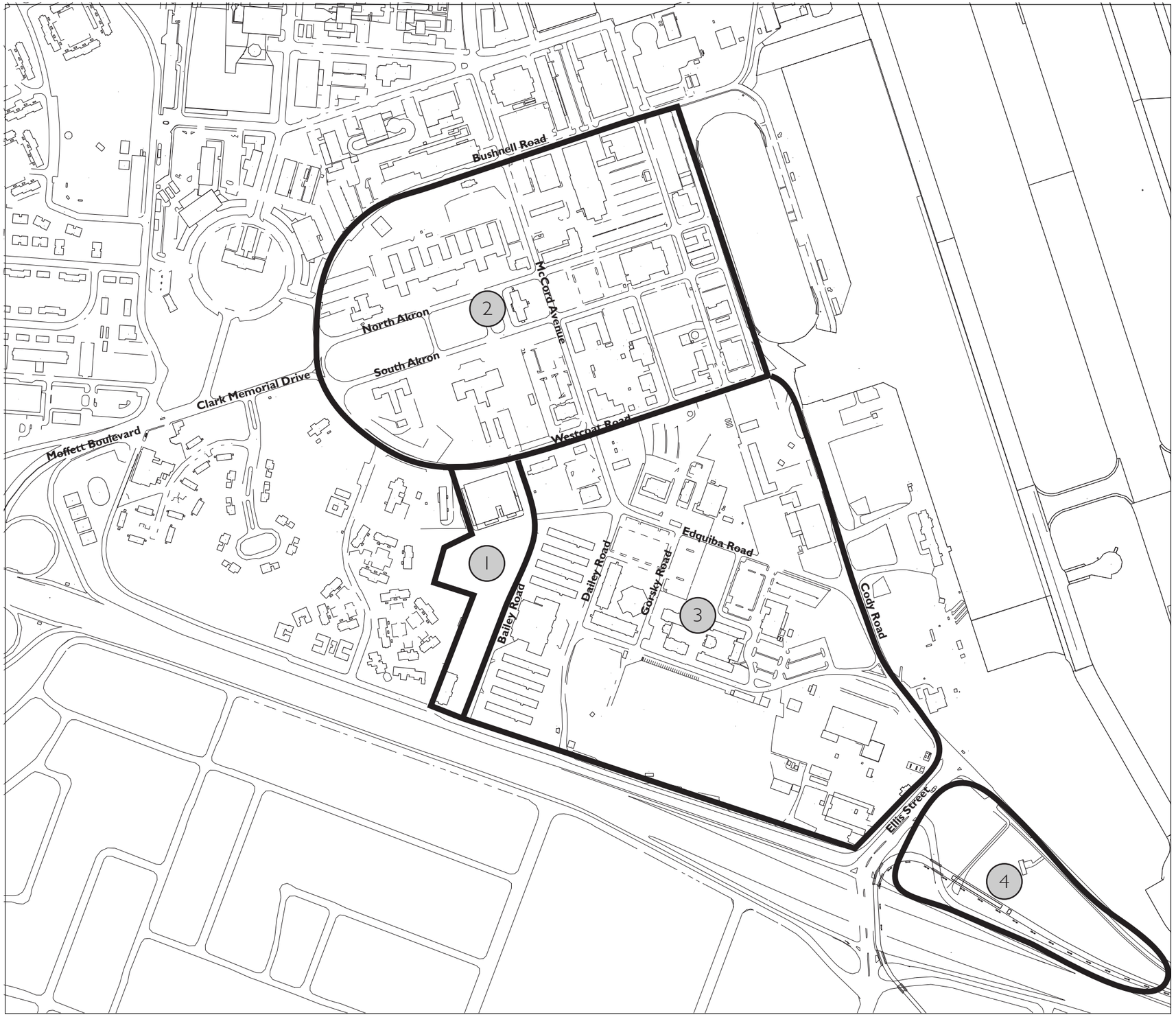
Preliminary studies indicate that it would be possible to safely construct the types of buildings foreseen under all proposed alternatives. Based on borings from the area north of N258[1], similar soils close to Bay View would be adequately buildable. However, no further analysis of on-site conditions has been undertaken. Geotechnical investigations would be needed before individual buildings could be constructed.

Under all of the development alternatives, a number of existing structures at Ames Research Center would be rehabilitated and reused. To the extent that these existing structures do not meet current Uniform Building Code seismic standards, future employees could be exposed to seismic and other geologic hazards, which would be a significant impact.

[1] Harding Lawson Associates. Geotechnical Investigation: Computer Research Facility Expansion, NASA-Ames Research Center, Moffett Field, CA. May 10, 1990.

FIGURE 4.8-1

APPROPRIATE BUILDING HEIGHTS BASED ON SUBSURFACE SOIL CONDITIONS



1 5 Stories or Higher

2 2- 3 Stories

3 5 Stories

4 2-3 Stories

N

0 28m 56m 113m

0 93ft 185ft 370ft

3. Cumulative Impacts

Geotechnical impacts occur on a site-by-site basis and are not exacerbated by multiple developments occurring in proximity to one another. Therefore, the cumulative projects listed in Chapter 2 would not combine with the NADP to generate cumulative geotechnical impacts.

C. Impacts and Mitigation Measures

This section summarizes significant impacts identified in Section B, and proposes mitigation measures for each identified impact.

Impact GEO-1: Many of the existing buildings that would be rehabilitated and reused do not meet current seismic safety standards.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure GEO-1: All rehabilitation of historic structures within the Shenandoah Plaza Historic District would follow the Guidelines for the Rehabilitation of Historic Structures developed by the Architectural Resources Group for NASA and within the Ames Campus would follow the Secretary of the Interior Guidelines for the rehabilitation of Historic Structures in order to maximize seismic safety while minimizing effects on the integrity of any structure on or eligible for the National Register of Historic Places.

Impact GEO-2: As is the case throughout the San Francisco Bay Area, new buildings, as well as the employees, residents, and visitors that use them, would be exposed to seismic hazards.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure GEO-2: All new buildings at Ames Research Center would be designed to meet the current Uniform Building Code regulations for seismic safety.

Impact GEO-3: As is the case throughout the Santa Clara Valley, new buildings could be exposed to structural hazards from ground subsidence. Also, because almost all of Ames Research Center sits on silty clay soils, new buildings would be exposed to geotechnical hazards such as differential settlement around buildings, and to cracking and heaving. The maximum height of proposed buildings would depend on several factors, including the depth to pockets of soft/medium stiff clayey soil, the thickness of surficial stiff crust, and the thickness of soft/medium stiff clay.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure GEO-3: All new construction would be designed based on geotechnical analyses of proposed sites to determine the structural measures necessary to counter the shrink-swell potential of the soil and the risk of structural damage from ground subsidence.

Impact GEO-4: Detailed geotechnical studies have yet to be completed for most of the potential building sites at Ames Research Center. While preliminary studies indicate that it would be possible to safely construct the types of buildings foreseen for all planning areas under any of the alternatives, there may be specific geotechnical hazards on individual sites that require mitigation when construction occurs.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure GEO-4: Prior to construction of individual facilities, NASA and its partners would conduct detailed geotechnical investigations of all proposed building sites, and would incorporate the engineering recommendations of these studies into building design and construction.

4.9 BIOLOGICAL RESOURCES

This section addresses all direct and indirect impacts expected to result from construction and operation of the alternatives for the NASA Ames Development Plan (NADP), including the No Action Alternative.

A. Standards of Significance

Impacts on biological resources were determined to be significant if the project had the potential to:

- Substantially reduce the number or restrict the range of a special-status plant or animal species.
- Substantially adversely affect habitat for special-status plant or animal species.
- Substantially disturb biologically unique or sensitive natural communities (e.g., riparian systems, wetlands).
- Substantially interfere with the movement of any resident or migratory wildlife species, with established native resident or migratory wildlife corridors, or with the use of native wildlife nursery sites.
- Violates a law, code, or ordinance protecting or regulating special-status species.

B. Impacts Discussion

This section analyzes potential impacts from each of the five proposed alternatives for development.

1. Alternative 1: No Action Alternative

Under Alternative 1, no new development beyond the baseline would occur in any of the planning areas. Current land uses in these areas would remain unchanged relative to the baseline. Any existing indirect impacts on biological resources would continue under Alternative 1. There would be no new direct impacts on biological resources under this alternative.

2. Alternative 2

Most of the parcels identified for development in the Bay View planning area under Alternative 2 are west of the OARF and are set back from the wetlands in the Bay View and North of Bay View areas. They are separated from wetland areas by a strip of open space approximately 30 meters (100 feet) wide (Bay View Parcel 11) that would serve as a buffer between developed areas and nearby wetland habitat.

East of the OARF, Alternative 2 provides for a 11-hectare (27-acre) burrowing owl preserve. The preserve was designed as part of NASA's Burrowing Owl Habitat Management Plan (BOHMP), which also includes a 9-hectare (22-acre) area in the NRP area, an 3-hectare (8-acre) site in the Existing Ames Campus area, and a 10-hectare (24-acre) area in the Eastside/Airfield area. In addition to protecting burrowing owl nesting habitat and foraging habitat, the preserves would also:

- Minimize impacts on other natural resources in the Bay View, Eastside/Airfield, and NASA Research Park areas.
- Buffer jurisdictional wetlands from the impacts of development, including light, glare and urban runoff.
- Provide foraging areas for other species such as golden eagles, and white-tailed kites.

The following sections address impacts expected to result from implementation of Alternative 2. Construction-related impacts (finite duration) are addressed separately from operations-related impacts (ongoing).

a. Construction-Related Impacts

The following sections describe potential impacts from construction noise, run-off and operations.

i. Construction-Related Noise

Noise generated under Alternative 2 by construction equipment in the Bay View area might affect salt marsh common yellowthroats and white-tailed kites,

but is not expected to have an adverse impact on the North of Bay View area. California clapper rails have been reported in Stevens Creek and in Crittenden Marsh, approximately 1.3 kilometers (0.8 mile) and 0.7 kilometers (0.4 miles) north of the Bay View area, respectively.[1] This is far enough away that construction noise generated in the Bay View area would not be expected to substantially disturb these clapper rails or their habitat, especially given that noise would be temporary and of much lower volume than the noise from testing at the OARF. The potential impact of construction-related noise on all special-status species within Ames Research Center from development under Alternative 2 would thus be considered less than significant.

ii. Construction-Related Mortality of Special-Status Wildlife

Under Alternative 2, construction vehicles would have the potential to inadvertently injure or kill wildlife, including individuals of special-status species. Potential impacts to burrowing owl are discussed below. In the Bay View area, construction vehicles would also pose a hazard to salt marsh harvest mice. Occurrence of salt marsh harvest mice has been confirmed in the coastal salt marsh in the North of Bay View area.[2] However, coastal salt marsh habitat is not adjacent to the portions of Bay View planning area that are marked for development. Because of this distance between development and salt marsh harvest mouse habitat, and because construction vehicles are unlikely to need to drive on the roads surrounding coastal salt marsh, the potential for take of salt marsh harvest mice (as defined under the Endangered Species Act [(16 U.S.C. § 1531 *et seq.*]; see discussion in Section 3.9) is considered extremely low. However, because of the extreme rarity of this species, this potential impact would be considered significant.

The long-legged myotis, yuma myotis, long-eared myotis, western mastiff bat, pallid bat, fringed myotis, and Townsend's big-eared bat are all bat species known to roost in buildings, and therefore could occur at Ames Research

[1] CDFG, 2001 and Layne and Harding-Smith, 1995.

[2] Layne and Harding-Smith, 1995 and Pomeroy, 1991.

Center (Table 3.9-2). Destruction of a winter roosting or maternity site from the demolition or renovation associated with the implementation of the NADP, would be considered significant. However, none of these bat species have been observed at Ames Research Center.

iii. Impacts on Jurisdictional Wetlands from Construction Runoff

Alternative 2 proposes construction within the Bay View and Eastside/Airfield areas, both of which are adjacent to extensive jurisdictional wetlands (see Figure 3.9-3). Runoff from construction sites could decrease water quality of these wetland communities. Thus implementation of Alternative 2 could result in indirect adverse impacts on adjacent wetlands if runoff from construction sites entered the wetlands. Because of the size and proximity of the proposed development to sensitive habitats, this impact would be considered potentially significant.

b. Impacts From Invasive Plant Populations Caused by Construction and Operations of the Proposed Action

Invasive non-native plant species have already substantially degraded some native habitats at Ames Research Center, including grasslands and seasonal wetlands. Species such as perennial pepperweed, periwinkle, yellow star-thistle, bristly ox-tongue, ripgut brome, and wild oats now dominate some habitats once dominated by native species, and these invasive non-native species have the potential to continue to spread. Further development at Ames Research Center, especially in the Bay View area, could increase the potential for the introduction of additional invasive non-native species as a result of improper selection or handling of landscaping or erosion-control materials. For example, hay bales used for erosion control might contain seeds of invasive weedy species. Construction equipment could also introduce weed seeds in dirt and debris carried from other areas. In addition, people using the trails surrounding native habitats could inadvertently spread invasive weed seeds on their clothes or shoes. This potential impact would be considered significant.

c. Operations-Related Impacts

The sections that follow describe potential impacts from the continuing operations of new development proposed under Alternative 2.

i. Increase of Predator Populations at Ames Research Center

New development at Ames Research Center would increase the number of employees on-site. This in turn would increase the chances that people would release cats into the sites or establish unauthorized feeding stations for feral cats and other predators. The populations of predators would thus increase, and with them predation on native species, especially ground-nesting birds and the special-status birds, such as the burrowing owl, discussed under Alternative 1 (No Project Alternative). This indirect impact would likely be particularly pronounced in the Bay View area because of the proximity of proposed development in this area to native habitats. This impact would be considered potentially significant.

ii. Loss of Foraging Habitat for Raptors

Raptors typically require hundreds of acres of grassland to forage successfully for small mammals and birds. Development proposed for the Bay View and Eastside/Airfield areas under Alternative 2 would reduce the amount of grassland and open space available as foraging habitat for raptors such as the golden eagle, white-tailed kite, northern harrier, and American peregrine falcon, and would also decrease the prey base for these species on Ames Research Center. Implementation of Alternative 2 could result in the loss of as much as 18 hectares (44 acres) of raptor foraging habitat, including non-native grasslands, seasonal marsh transition, and weed-dominated areas. However, the majority of this habitat (non-native grasslands and weed-dominated areas) is of low to moderate quality. In addition, extensive areas of grassland and seasonal wetland would be preserved in the Eastside/Airfield area and in the North of Bay View area. Suitable raptor foraging habitat is also present near the Bay View area at Shoreline at Mountain View Regional Park and at the Palo Alto Baylands. The amount and quality of habitat lost as a result of implementing Alternative 2 would be small compared to the amount

of foraging habitat available in the vicinity. Thus, this impact would be considered less than significant.

iii. Loss of Jurisdictional Wetlands

The wetland delineation was verified by the Army Corps of Engineers (Corps) in May 2001, and is included in Appendix E of this document. Some of the seasonal wetlands identified in the Bay View area in the preliminary wetland delineation were eliminated from the final verification based upon the human-induced ponding mechanism that, when removed, also removed wetland indicators from the ponded areas. Thus, the total area of verified wetlands near the Bay View area 2.1 hectares (5.3 acres) was less than those identified in the preliminary delineation 2.2 hectares (5.5 acres).

After the verification, NASA altered the boundary of the Bay View area to avoid direct impacts to wetlands as a result of implementing the proposed action. These changes were not reflected in the Draft Programmatic EIS, but are incorporated into this Final Programmatic EIS.

iv. Effects of Increased Stormwater Runoff from Impermeable Surfaces on Sensitive Habitats

Construction of new buildings, roads, and parking lots within the Bay View area under Alternative 2 would increase the extent of impermeable surfaces in this planning area, potentially increasing stormwater runoff into adjacent habitats. Runoff from constructed impermeable surfaces might contain oil, grease, pesticides, fertilizers used on landscaping, and other pollutants typically found in urban areas. If contaminated runoff were to enter the sensitive and high-quality wetland habitats in the North of Bay View area, the pollutants it contained could adversely affect these habitats and the special-status species known or suspected to occur there, including salt marsh harvest mice, salt marsh common yellowthroats, and white-tailed kites. Moreover, additional freshwater inputs to the wetland habitat in the North of Bay View area could alter plant and animal species composition and flood sensitive habitat. This impact would be considered potentially significant.

NASA studied this potential impact in the Biological Assessment for the NADP, and found that only small changes would occur in the amount of freshwater runoff entering the Eastern Diked Marsh (EDM) and the SWRP as a result of development foreseen under Alternative 2. Consequently, substantial changes to the plant and animal communities in these wetland areas are not expected. Additionally, discharges to the Western Diked Marsh (WDM) would not be substantially increased or decreased under Alternative 2 relative to baseline conditions, so no significant impacts to wetlands are expected.

v. Impacts on Nocturnal Species Caused by Increased Lighting

Many mammals, amphibians, and some birds (e.g., western burrowing owls) are active at night. Lighting along roads and buildings in the proposed development areas might impact these species by disrupting their movements, breeding, or other behaviors. Habitat that is currently suitable for these species might be rendered unsuitable for some species if it were artificially lit at night. However, lighting might benefit other species within the planning areas. For example, night lighting might attract more nocturnal insects to the area, increasing available food for insect-feeding birds such as western burrowing owls.

The impact of increased lighting resulting from proposed development in the NRP and Eastside/Airfield areas would not be considered significant because of the extensive development and lighting already present in those areas. The impact of increased lighting in the Bay View area would be considered potentially significant because of this area's proximity to sensitive seasonal wetlands in the North of Bay View area.

vi. Effects on Wildlife of Increased Traffic Generated by Development

Development of increased office and laboratory space in all planning areas under Alternative 2 would increase the daily volume of vehicle traffic at Ames Research Center. Increased traffic might increase traffic-related disturbance of wildlife on-site, and would almost certainly increase the chance of collisions between wildlife and vehicles. However, potential effects on wildlife other

than burrowing owls, which are addressed below in Section 4.9 B.2.d., are expected to be minor because special-status species are generally located in areas that are some distance from high-traffic areas. In addition, non-special status wildlife located in the Bay View and North of Bay View areas are already accustomed to disturbances from existing traffic. This impact is therefore considered less-than-significant.

vii. Loss of Upland Habitat Adjacent to Marsh Areas

All or most of the development proposed under Alternative 2 would occur in upland habitat such as non-native grasslands and weed-dominated areas. Development in the Bay View area would reduce the extent of upland habitat directly adjacent to marsh habitats, thus decreasing the area of potential habitat for Alameda song sparrow, salt marsh common yellowthroat, tricolored blackbird and horned lark. However, the majority of upland habitat currently used by these species would be left intact, and development would remove only the lowest-quality habitat used by these species (i.e., habitats dominated by non-native and weedy species). Thus, this impact would be considered less than significant. Burrowing owl habitat preservation is addressed below.[3]

viii. Impacts to Western Pond Turtle and/or Their Habitat as Result of Changes to the Storm Water Drainage System

Changes in the storm water drainage system could impact western pond turtles by allowing polluted waters to enter the Northern Channel. The storm water system would include filtration structures designed to ensure that the quality of water pumped out of NASA Ames does not change from current or existing conditions. Because of the water filtration system, the water quality in the Northern Channel is not expected to be changed by the NADP. Therefore , there would be no expected impact to the western pond turtle.

[3] Trulio, L. *Burrowing Owl Habitat Management Plan*, March 2001. Prepared for PAI Corporation and NASA Ames Research Center.

d. Potential Impacts on Burrowing Owls

This section describes seven potential impacts to burrowing owls from development proposed under Alternative 2. These impacts would be mitigated as much as possible by implementation of the BOHMP, described in greater detail in Chapter 2.

i. Loss of Birds

Development of burrowing owl habitat could cause bird mortality if burrows were destroyed while birds were underground. Most of the proposed development would occur in areas that do not currently provide owl nesting habitat. However, development is planned for a portion of owl habitat located between Hangar 1 and the NRP Preserve (NRP Parcel 19 on Figure 2.2), where up to three pairs of owls have typically nested in the past. This area, composed of NRP Parcels 7 and 8, is the only portion of the site where this impact could occur unless owls moved into other areas that are proposed for development. Because owls are protected by the federal Migratory Bird Treaty Act (16 U.S.C. § 703-712 *et seq.*) and California regulations, loss of any animals would be significant. Therefore, this impact would be considered potentially significant.

ii. Loss of Nesting and Foraging Habitat

Ames Research Center has established Burrowing Owl Nesting Habitat Preserves in each of the four planning areas. Moreover, NASA has identified other areas, not designated as Preserves, which currently provide burrowing owl nesting habitat (Figure 3.9-2). No development is proposed in any of these areas except in NRP Parcels 7 and 8. Consequently, most of the potential impacts to owl nesting habitat have been avoided. However, the loss of nesting habitat in NRP Parcels 7 and 8 would be considered a significant impact.

In the Ames Campus area, NASA is planning to create a softball field in the area just north of the 40- by 80-Foot Wind Tunnel. This area has often supported one or two pairs of nesting owls. The proposed use would be considered compatible with the existence of burrowing owls on the site as long as owl habitat was planned as part of the ballfield, and the ballfield was maintained in a manner that supported owl foraging and nesting.

Consequently, the impact of creating a ballfield in this area would be considered less than significant.

Besides nesting habitat, owls require large grasslands for foraging. Under baseline conditions, approximately 362 hectares (893 acres) of foraging habitat exist at Ames Research Center: 178 hectares (440 acres) of upland grassland, 50 hectares (123 acres) of recreational fields, and 134 hectares (330 acres) of wetlands. Approximately 12 hectares (28 acres) of upland grassland would be developed in Bay View (Parcels 1, 2 and 3). Approximately 4.5 hectares (11 acres) of land (Parcels 4 and 5) would be used as recreation fields. . Because the loss of foraging habitat would be small compared to the amount available, and because foraging habitat is available nearby to the areas that would be developed, this impact would be considered less than significant.

iii. Disturbance to Burrows

Project construction might result in short-term, temporary impacts to owl burrows. Construction in some areas, particularly in the NRP and the Ames Campus areas, might occur within 49 meters (160 feet) of owl burrows during the non-nesting season and within 76 meters (250 feet) during the nesting season. This short-term impact would be considered significant.

Long-term, permanent burrow disturbance might occur as a result of more development next to owl habitat. More people would be likely to walk or ride through sensitive owl nesting areas. There would also be significant increases in public access and traffic. The number of people expected to visit public attractions associated with the new development has not yet been quantified, but these people would provide additional pressure on nesting and resident owls. Visitors might also bring dogs to walk in the open fields where the owls nest. These long-term impacts would be considered potentially significant.

iv. Increased Vehicle Collisions

With development under the NADP would come more vehicle traffic. More employees, visitors and delivery needs would add more vehicles to the roads and increase the likelihood of burrowing owl mortality due to vehicle

collisions. Since owls are most active at night, the risk to owls is especially great from dusk on. This would be a potentially significant impact.

v. Control of Ground Squirrels

When sites are developed, landscaping is often managed to keep it free of ground squirrels. In addition, ground squirrel eradication may be implemented in open areas near new development because the squirrels are considered unsightly and a nuisance. However, an active ground squirrel population is an important element of owl preservation efforts. Because these colonial rodents are critical to the survival of burrowing owls in the South Bay, elimination of squirrel colonies could be a significant negative impact to burrowing owls. In addition, poisons used to kill squirrels might potentially kill burrowing owls, which would clearly be a significant impact.

vi. Decreased Prey Base

Building and grounds managers of new buildings might want to eliminate local rodents and insects on and adjacent to the development. The burrowing owls' prey base of small rodents (mice and voles) and insects would decrease if control methods were used in or near their habitat. This type of land management would have negative impacts on owl survival and reproduction. These impacts would be considered potentially significant.

vii. Increased Predation

New development under the NADP could increase the population of predators by planting new trees and installing light poles that provide perches for birds of prey, and by increasing the population of people feeding feral cats. This could have a significant impact on burrowing owl populations at Ames Research Center.

3. Alternative 3

Alternative 3 proposes new development in the NRP and Eastside/Airfield areas only.

Under Alternative 3, impacts would be similar to those described for Alternative 2 in the NRP and Eastside/Airfield areas. Impacts in the Bay View area would be minimized since no development would occur there.

As under Alternative 2, construction vehicles in the NRP area could affect western burrowing owls under Alternative 3. However, the increase in the number of workers present at Ames Research Center would be substantially less under Alternative 3 compared to that under Alternatives 2 or 4. Therefore, Alternative 3 would result in only a slight increase in the chance that additional workers would feed feral cats and other non-native predators.

4. Alternative 4

Like Alternative 2, Alternative 4 provides for open space between proposed development in the Bay View area and wetland habitat to the north. Although relatively narrow, the open space would buffer the wetlands from potential indirect impacts of development, including light, glare, and urban runoff. Alternative 4 also includes plans for the creation of burrowing owl preserves in the NRP, Ames Campus, and Eastside/Airfield areas. However, no burrowing owl preserve would be created in the Bay View area. This would reduce the amount of habitat in the Bay View area for burrowing owls in particular, but also decrease the area of foraging habitat provided for other species and the habitat available for buffering wetlands from urban runoff and other indirect impacts related to development. This impact is considered significant.

As discussed in Alternative 2, NASA altered the footprint of development for Alternative 4 based upon the results of the wetland delineation to ensure that no direct impacts would occur from the implementation of the proposed action. These changes are reflected in the analysis of Alternative 4.

5. Alternative 5

Alternative 5 proposes development in the NRP, Eastside/Airfield, Ames Campus and Bay View areas. The proposed action is not expected to result in

take of any federally-listed fish or wildlife species. No federally-listed plants are known or expected to occur in the areas affected by the proposed action.

Alternative 5 would avoid impacting the jurisdictional wetlands that occur on-site. All of the impacts discussed for Alternative 2 would also apply to Alternative 5, but to a lesser extent because Alternative 5 proposes less development in biologically sensitive areas, providing a greater buffer between proposed development and sensitive habitats and wetlands. Moreover, the parcels identified for development under Alternative 5 are set back from the wetlands in the Bay View and North of Bay View areas.

West of the OARF, parcels slated for development are separated from the wetlands by a strip of open space approximately 30 meters (100 feet) wide (Parcel 11) that would serve as a buffer between developed areas and nearby wetland habitat. In Mitigated Alternative 5, the Preferred Alternative, the setback has increased to 61 meters (200 feet). Alternative 5's proposed open space designation for the parcels adjacent to the burrowing owl preserve (Parcels 10, 6, and 7) would provide improved buffering for both the preserve and the wetlands in the east portion of the Bay View area. Open space proposed for Parcels 8 and 9 under Alternative 5 would also buffer the Bay View wetlands.

Implementation of the proposed burrowing owl preserve and open spaces would secure large areas of grassland and ruderal habitat. This would serve the primary purpose of protecting western burrowing owl nesting and foraging habitat, and would also (1) provide foraging habitat for raptors and other grassland species, (2) protect adjacent wetlands, and (3) minimize impacts on sensitive natural resources, as discussed above for Alternative 2. Specific impacts that would be minimized include light (glare), urban runoff, and construction-related impacts.

As discussed in Alternative 2, NASA altered the footprint of development in Alternative 5 based upon the results of the wetland delineaton to ensure that no direct impacts would occur from the implementation of the proposed

action. Although these changes were not included in the Draft Programmatic EIS, they are reflected in this Final Programmatic EIS.

Seasonal wetlands located between the runways in the Eastside/Airfield area would not be affected by development proposed under Alternative 5. In addition, wetlands and waters of the United States along the North and East Patrol Roads and Marriage Road would be buffered from development by the burrowing owl preserve (Parcel 7) and open space on Parcel 8 (the golf course).

The increase in the volume of storm water to be generated from the implementation of this action is expected to be only 4 percent of average annual flows into the SWRP. Because most, if not all of the storm water is expected to be contained on site, the increase in water that may be pumped into Stevens Creek would be much less than 4 percent. When compared to the amount of water normally flowing in Stevens Creek, the addition of this small amount of water from the SWRP is not expected to impact creek volumes.

No effect is expected to the water quality of Stevens Creek from the increase in pumping into the creek. Swales and other water filtration mechanisms have been incorporated into the design of the storm water drainage system to maintain high water quality in the SWRP. This, in turn, regulates the quality of the water that supplies habitat for wildlife and/or may be discharged into Stevens Creek.

There is also no change expected to water temperatures in Stevens Creek from the increased pumping. The temperature of the still waters of the SWRP may have slightly higher temperatures than water flowing in Stevens Creek. However, as stated above, only a small amount of water (much less than 4 percent of runoff from Ames Research Center) would be discharged as compared to normal flows of Stevens Creek, and the discharge would occur only once or twice during the year. Therefore, any changes in temperature in Stevens Creek would be very small and highly localized to the discharge point of the water from the SWRP. In addition, the timing would be such that

anticipated high flows from the incoming storm would negate any temperature effects within a few hours.

Because of the maintenance of existing water volume, salinity, and quality in the eastern and western diked marshes and SWRP and the very small amount of discharge into Stevens Creek, no impacts to Stevens Creek, vegetation along the creek, or the sensitive species that occur there are anticipated. On April 23, 2001, the National Marine Fisheries Service (NMFS) indicated that the proposed project had no potential to affect fish species that are threatened, endangered, proposed, or candidates for listing.[4]

The remainder of the development proposed under Alternative 5 would take place in the Ames Campus and NRP areas. In these intensively developed areas, development would consist of infill and renovation of existing buildings, and would be similar to development proposed for these areas under Alternative 3. As discussed above for Alternative 3, the Ames Campus and NASA Research Park areas consist of weed-dominated, disturbed, and urban landscaped habitats. Western burrowing owls are the only sensitive species that would be impacted by development in these areas under Alternative 5.

6. Cumulative Impacts

Ames Research Center is one of the few sites in the region that has both development potential and biological value. The cumulative projects listed in Chapter 2 would all occur on existing developed lands which have minimal potential to serve as biological resources. Thus there would be no opportunity for the cumulative projects to combine with the NADP to create additional cumulative adverse biological impacts.

[4] Gary Stern and Brian Staab, personal communication, citation in Biological Assessment (Appendix E).

Past impacts on biological resources from projects that have already occurred have been considerably greater than those predicted in this EIS from the NADP or the cumulative project list.

Before human settlement, the site of Ames Research Center supported large expanses of moist grassland, with small areas of riparian forest and willow groves near Stevens Creek and other creeks.[5] Further toward the bay, habitats changed to tidal marsh and tidal flat, including an intricate system of sloughs and drainage channels.

Over time, 83 percent of the original tidal marshes in southern San Francisco Bay have been converted to salt ponds. The moist grasslands on the current ARC site were filled and developed, and similar conversion occurred in the adjacent cities of Mountain View, Sunnyvale, and San Jose, as well as other bay area communities. Natural drainage channels were diverted and channelized, virtually eliminating historical sheet and channel flows of water from the Santa Cruz Mountains to the Bay. Thus, little of the original habitat found in the past is now available for native plants and wildlife. As a result, some of the species found only in these habitats have declined substantially and have been listed by the state or federal government as threatened or endangered. Examples include the salt-marsh harvest mouse and California clapper rail, which are described in Section 3.9. These habitats may increase in the future as salt ponds and other areas are "reclaimed" for their historic habitats.

Cumulative loss, fragmentation and isolation of grassland in the region has adversely impacted western burrowing owls by reducing the amount of habitat available for nesting, foraging, and dispersal. In a 1996 survey of open grasslands in Silicon Valley that were occupied by burrowing owls in the early to mid-1980s, it was found that almost 60 percent of previously existing habitat

[5] Goals Project. 1999. Baylands Ecosystem Habitat Goals. A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. First reprint. U.S. Environmental Protection Agency, San Francisco, Calif./S.F. Bay Regional Water Quality Control Board, Oakland, Calif.

had been developed.[6] Current development projects in the region such as Agnews Development Center and Mission College will have further adverse effects on burrowing owls.

Grasslands are also being lost rapidly throughout the U.S. as well. Analysis of breeding bird survey data from 1966 to 1996 by the Patuxent Wildlife Research Center found that grassland species showed consistent declines during this period. As this habitat is lost, species become rare. The western burrowing owl is one grassland species that is declining nationwide.

Habitat loss and owl-destructive management practices have reduced the owl population to a critically low level in Santa Clara County. As Santa Clara county experienced growth during the 1980s, approximately 60 percent of the burrowing owl population was lost during that decade.[7] DeSante and Ruhlem showed that the burrowing owl apparently has also been extirpated as a breeding species within last 10 to 15 years from Marin, San Francisco, Santa Cruz, and Napa counties. It has been very nearly extirpated from Sonoma, Santa Barbara, Orange and coastal San Mateo and Monterey counties.[8]

However, burrowing owls have also been found to adapt to some human landscapes and disturbance. Single owls and pairs can often be found in large parcels of vacant land in and around developed areas. Today, the South San Francisco Bay region, which includes Santa Clara and Alameda Counties, supports a population of approximately 120 pairs of burrowing owls. NASA Ames Research Center supports the largest subpopulation of burrowing owls in this region.

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[6] Trulio, 1998

[7] *Ibid.*

[8] Desante, D.F. and E. Ruhlen. *A Census of Burrowing Owls in California, 1991- 1993.* Institute for Bird Populations, Point Reyes Station, CA, 1995.

Ames Research Center is one of the only sites in the region that still maintains biological value for species that depend on wetlands near the bay and upland species such as burrowing owls. Proposed development at the Ames Research Center would avoid, or mitigate impacts to these sensitive habitats. In addition, the protection of the burrowing owls at Ames Research Center provided through implementation of the Burrowing Owl Habitat Management Plan (BOHMP) will ensure the continued conservation of this species in the proposed project area. With the inclusion of these measures, the NADP is not expected to significantly contribute to past cumulative impacts to sensitive species and habitats in the South Bay region.

C. Impacts and Mitigation Measures

This section summarizes significant impacts identified in Section B, and proposes mitigation measures for each identified impact.

Impact BIO-1: Construction vehicles could inadvertently injure or kill individuals of special-status species or migratory birds. Because of the rarity of salt marsh harvest mouse (an endangered species), in particular, construction-related mortality could be a significant impact.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure BIO-1: To minimize the potential for injury or death caused by construction vehicles to western burrowing owls or migratory birds in all four planning areas and to salt marsh harvest mice in the Bay View area, the following components would be implemented:

- As much as possible, construction traffic would not be routed on roads adjacent to habitats where these special-status species occur and would be prohibited from using roads when habitat considerations require it.
- Occupied or potential habitat for these species near established routes would be marked as off-limits to construction vehicles.

- In the Bay View area, if construction vehicles must travel on roads within approximately 30 meters (100 feet) of occupied or potential habitat, drift fencing would be erected to prevent salt marsh harvest mice from crossing these roads. The drift fencing would be placed so that harvest mice retain access to adjacent upland habitats for use as refugia during high water events.
- All drivers of construction vehicles would be informed of the established vehicle routes and made aware of the importance of avoiding occupied and potential habitat for western burrowing owls and salt marsh harvest mice.
- Construction activities would not be allowed to disturb nesting migratory birds.

Impact BIO-2: There could be indirect adverse impacts if runoff from construction sites entered adjacent wetlands, decreasing water quality in these wetland communities.

Applicable to: Alternatives 2 and 4

Mitigation Measure BIO-2a: To minimize impacts on wetlands, construction would be avoided in the jurisdictional wetlands along the northern boundary of the Bay View area and within 30 meters (100 feet) of these wetlands. Fill activities and other disturbances would be minimized in jurisdictional wetlands elsewhere in the Eastside/Airfield area.

Mitigation Measure BIO-2b: A wetland enhancement plan would be developed for the restoration of functions and values of aquatic habitats in and adjacent to the Bay View area and outside of development area. This plan would include provisions to improve the quality of existing wetlands in the Bay View area through removal of invasive non-native plants such as periwinkle and perennial pepperweed. This enhancement plan would be developed in coordination with, and would be approved by, the US

Army Corps of Engineers and the Regional Water Quality Control Board prior to implementation of the proposed action.

All construction near or adjacent to wetlands would implement standard Best Management Practices to minimize runoff into these sensitive areas. Implementing grading and construction during the driest months of the year (July–October) would reduce the potential for siltation and runoff into surrounding habitats.

Impact BIO-3: Further development at Ames Research Center, especially in the Bay View area, could increase the potential for the introduction of additional invasive non-native species as a result of improper selection or handling of landscaping or erosion-control materials. In addition, people using the trails surrounding native habitats could inadvertently spread invasive weed seeds on their clothes or shoes.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure BIO-3: Landscaping would be designed with native species (with the possible exception of lawn areas). Invasive plants would not be used in any landscaping. Any imported soil used for landscaping must be certified as weed-free. Similarly, any erosion-control structures that contain hay or other dried plant material (e.g., hay bales) must be certified as weed-free. Any construction equipment operating within 76 meters (250 feet) of jurisdictional wetlands or other sensitive habitats in the Bay View area would be washed with reclaimed water prior to use in this area to remove potential weed seeds. The construction zone would be surveyed periodically by a qualified botanist, so that any infestations of invasive species that establish within the construction zone of the Bay View area can be eradicated before the plants can flower and set seed.

Impact BIO-4: New development at Ames Research Center would increase the number of employees on-site, with a corresponding increase in the potential for people to release unwanted cats and establish unauthorized feeding stations

for feral cats. The populations of feral cats and other predatory species would increase, and with it predation on native species, especially ground-nesting and special-status birds.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure BIO-4a: NASA and its partners would institute the following programs and policies to limit increases in predator populations:

- Prohibit employees from feeding wildlife, including cats.
- Institute and enforce a no pets policy in new housing.
- Install trash containers that cannot be opened by predator species.
- Augment the existing non-native predator control program, which includes humane trapping and removal of feral cats and other non-native predators, including, but not limited to, red fox, skunk, racoons, rats, and dogs.
- Conduct a public education program about the impacts caused by non-native predators and the need to refrain from feeding feral cats and other wildlife.
- A regular construction cleanup crew would be designated to ensure that construction debris and trash do not attract predators or scavengers.

Mitigation Measure BIO-4b: Design north and east fences bordering Bay View housing to eliminate movement of potential predators from the housing area to sensitive wildlife areas. The design would include:

- Burying the bottom portion of the fence at least 46 centimeters (18 inches) below ground level.
- Making the fencing grid size small enough to prevent rats from passing through.

— Placing roll wire along the top of the fencing to eliminate predators climbing over the fence and to deter avian predators from perching.

Impact BIO-5: Building-roosting bats may be disturbed by the demolition and renovation of existing buildings at Ames Research Center.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure BIO-5: To avoid impacts to roosting bats, a preconstruction survey of buildings to be demolished or renovated would be conducted by a qualified wildlife biologist in accordance with recommendations of the California Department of Fish and Game. If special-status roosting bats are found, CDFG would be consulted. An avoidance or mitigation plan would be developed and implemented. Avoidance measures could include construction outside of hibernation and maternal roosting time periods (winter), excluding bats from the buildings after they have left the roost to forage at night by closing entrances, and the construction of bat boxes to accommodate displaced bats. If bat boxes are used, NASA would monitor their success.

Impact BIO-6: An increase in the population at Ames Research Center would increase the amount of refuse that may be disposed of in and around buildings. Wildlife, especially feral cats and non-native predatory species, often forage in trash receptacles where food waste is disposed. This may result in an increase of these species in and around Moffett Field, which would increase predation on native species.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure BIO-6: NASA and its partners would use trash receptors that are animal resistant, and will maintain a regular garbage disposal schedule.

Impact BIO-7: Lighting along roads and buildings in proposed development areas in the Bay View area may impact wildlife species by disrupting their movements, breeding, or other behaviors.

Applicable to: Alternatives 2, 4 and 5, and Mitigated Alternative 5

Mitigation Measure BIO-7: NASA is conducting a lighting study to determine baseline levels. When feasible, nighttime lighting would be excluded in new development adjacent to high-quality wildlife habitat in the North of Bay View area. The Bay View housing would not be allowed to cause a net increase in lighting in the areas north or east of Bay View. The impacts of necessary lighting would be minimized by using low-glare light sources (e.g., low pressure sodium lighting) mounted on short poles and directed away from native habitats. In addition, light amplification to nearby sensitive areas would be eliminated through directional lighting with baffles, non-reflective tinting on windows, and other mechanisms.

Impact BIO-8: Removal of one hole of the golf course under Alternatives 2 and 4 would reduce existing habitat area for burrowing owls.

Applicable to: Alternatives 2 and 4

Mitigation Measure BIO-8: This impact would be mitigated by the creation of the burrowing owl preserve in the Eastside/Airfield area, which would be large enough to accommodate up to five pairs of owls. Thus any owls which would be affected by the removal of one hole of the golf course would have sufficient nearby habitat to relocate.

Impact BIO-9: Development on burrowing owl habitat could cause bird mortality if burrows were destroyed while birds were underground.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure BIO-9: NASA would:

- Protect owl burrows wherever possible through careful site planning and inspection during construction.
- Where burrows must be removed, evict owls outside the breeding season via passive relocation based on a plan developed by a qualified owl biologist.
- Replace lost burrows outside of the nesting season, before construction begins. Burrows would be replaced at a 3:1 ratio either within the owl preserves or in other suitable on-site habitat areas.
- Place a Habitat Conservation Easement over burrowing owl preserves.

Impact BIO-10: While NASA has taken steps to avoid most potential impacts to nesting habitat, new development would result in the loss of owl nesting habitat in NRP Parcels 7 and 8. In addition, development would cause the loss of some foraging habitat, especially in the Bay View area.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure BIO-10: NASA and its partners would:

- Establish a burrowing owl preserve in the NRP area which would prevent impacts to owls currently nesting within the future preserve area, and mitigate impacts to owls that might be disturbed by development on NRP Parcels 7 and 8. Restoration, including the removal of concrete, asphalt and other structures, and enhancement of the preserve in the NRP area sufficient to offset development impacts would occur prior to that development.
- Design landscaping in developed areas with low growing native vegetation to enhance owl use.
- Minimize the development footprint to the extent possible, and locate new development adjacent to existing development to minimize habitat fragmentation.

- Minimize construction impacts on nesting and foraging habitat by restricting the area available for circulation and staging of equipment.
- Manage other grassland areas at Ames Research Center to support owls and their prey.

Impact BIO-11: There could be short-term disturbances to existing burrows if construction occurred too close to the burrows. There could also be long-term disturbances caused by increased intrusion into nesting areas by new residents, employees, and visitors and their pets.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure BIO-11a: In order to minimize short-term disturbances from construction, NASA would adopt the BOHMP, which recommends the following:

- Construction near owl habitat would be scheduled outside of breeding season, which typically runs from February 1 to August 31, as much as possible.
- Construction would be kept as far from nesting areas as possible. If possible, NASA would maintain a minimum 49-meter (160-foot) buffer around occupied burrows during the non-nesting season, and a minimum 76 meter (250-foot) buffer during the nesting season.
- If it is not possible to maintain these distances, NASA would work with a qualified owl biologist to determine appropriate distances from active burrows, fence burrows off from construction activities, and provide owls the opportunity to move by installing artificial burrows further from construction areas before construction begins.
- NASA would work with a qualified owl biologist to find circulation routes, staging areas, and areas for other construction activities that will minimize impacts to owls or their burrows.

Mitigation Measure BIO-11b: In order to prevent long-term disturbances from increases in population associated with implementation of the NADP, NASA and its partners would:

- Fence off owl habitat with attractive fencing and low, native shrubs.
- Design paths around the perimeter of owl habitat to allow people to see the owls without disturbing them.
- Prohibit walkers, bikers, and dogs from moving through the habitat areas.
- Use signage to educate people about the owls and their sensitivities.
- Monitor habitat areas after construction, and implement further protective measures as needed.
- Restrict construction of roads, trails, pathways, and other development from occurring within designated burrowing owl preserves.

Impact BIO-12: Burrowing owls often fly fairly low to the ground, so increases in vehicular traffic as a result of new development would in turn increase the potential for owl/vehicle collisions.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure BIO-12: In order to minimize increases in vehicle collisions with burrowing owls, NASA and its partners would :

- Post 25 MPH speed limits along roads adjacent to owl habitat.
- Route traffic away from owl habitat as much as possible, especially at night.
- Plan new roads and other transportation corridors away from owl habitat wherever possible.
- Monitor traffic impacts to burrowing owls, and implement additional mitigation measures if necessary.

Impact BIO-13: Measures to control ground squirrels could negatively impact burrowing owls, which are dependent on the squirrels for a variety of functions.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure BIO-13: NASA would:

- Conduct no squirrel control in the owl preserves, and as little as possible in other owl habitat areas.
- Allow squirrels to inhabit areas around new development that will not be used by people.
- Work with a qualified owl biologist to develop an eradication plan that minimizes effects on burrowing owls if squirrels must be controlled.

Impact BIO-14: New development could decrease the owls' prey base if building managers eliminated the small rodents and insects that form the burrowing owls' prey base in developed areas.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure BIO-14: To protect the owls' prey base, NASA would adopt the BOHMP, which recommends the following:

- Allow small rodent and insect control only directly around buildings.
- Forbid the use of biocides adjacent to or within owl habitat.
- Limit, or if possible, prohibit the killing of small rodents or insects in the owl preserves, enhanced owl habitat, and any other areas where owls nest or forage.

Impact BIO-15: Proposed new development could increase the population of predators by planting new trees and installing light poles that provide perches

for birds of prey, by creating habitat for rodents, and by increasing the population of people, some of whom may feed feral cats.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure BIO-15: In order to prevent increased predation, NASA would enforce Mitigation Measure BIO-4, above. In addition, NASA and its partners would:

- Continue on-going efforts to control non-native predators in conjunction with US Fish and Wildlife.
- Limit tree planting along roads or buildings adjacent to owl and other wildlife habitat areas to minimize the increase in available perches for avian predators, and modify other potential perches structurally to discourage predators.
- Minimize outdoor lighting posts near burrowing owl and other wildlife habitat to reduce new perches for avian predators. Where lighting is needed for safety reasons, install devices to discourage birds from perching.
- Trees in Bay View adjacent to the Western Dikes Marsh would be from the USFWS approved list.
- Compensate for increases in predation by eliminating predator perches along and within the boundaries of the Western Diked Marsh, Eastern Diked Marsh and Storm Water Retention Pond.
    - Place roll wire atop all fencing surrounding the eastern and western diked marshes and the storm water retention pond.
    - Place anti-perch devices on and surrounding the Plant Engineering facilities at the northwest corner of ARC property.
    - If feasible, remove all landscape features within these areas that provide perches for avian predators.

- If possible, avoid the use of rip rap on slopes resulting from fill of the Bay View housing area. If rip rap must be used, it must be small diameter materials that would not create habitat for rodents.
- Avoid placing rip rap on existing marsh vegetation.

Impact BIO-16: Alternative 4 would result in the loss of approximately 11 hectares (27 acres) of burrowing owl habitat in the Bay View Area.

Applicable to: Alternative 4

There is no mitigation measure available for this impact other than reconfiguring the alternative so that it would be more similar to Alternatives 2, 3 and 5. Thus, this impact would be significant and unavoidable for Alternative 4.

Impact BIO-17: Although the measures to reduce impacts to burrowing owls are expected to be sufficient to reduce impacts to less-than-significant levels, there can be no guarantee of this without monitoring of owl populations. If the measures were ineffective and owl populations decreased, a significant impact would occur.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure BIO-17a: NASA would monitor the burrowing owl population change at Ames Research Center – including changes in adult and pair numbers, changes in chick production, and general mortality factors – in relation to these parameters as measured for a reference owl population in Santa Clara County over a 3-year period. The reference population would be determined based on population dynamics research conducted by a qualified ecologist.

Mitigation Measure BIO-17b: If the Ames Research Center owl population or chick production (compared to the reference population)

experiences a significant drop, either statistically or in the opinion of a qualified owl biologist over a 3-year time period, NASA would implement these further actions:

- Hire a qualified owl biologist to determine if the population decline is due to human impacts from development in the NADP and to determine the sources of population decline due to development in the NADP.
- Implement actions and management activities designed by a qualified owl biologist to mitigate those sources of population decline and to return population levels to pre-NADP development levels.
- Continue monitoring owl population dynamics to determine if the mitigation measures have been successful at stabilizing the population and increasing the population to pre-NADP development levels. Measurements would be based on a 3-year time frame.

Impact BIO-18: There could be indirect adverse impacts if runoff from construction sites entered the existing storm drain system and the Storm Water Retention Pond.

Applicable to: Alternative 5 and Mitigated Alternative 5

Mitigation Measure BIO-18: Potentially contaminated runoff would be managed using stormwater BMPs. Swales would be constructed adjacent to wetlands in upland areas to intercept and filter any runoff before it reaches the wetland. Construction of swales would be permitted within the buffer zone around wetlands, but not within the wetlands themselves.

Impact BIO-19: There could be indirect adverse impacts if runoff from construction sites entered adjacent wetlands, decreasing water quality in these wetland communities.

Applicable to: Alternative 5 and Mitigated Alternative 5

Mitigation Measure BIO-19: To minimize impacts on wetlands, construction would be avoided in the jurisdictional wetlands along the northern boundary of the Bay View area and within the buffer zone of these wetlands. Fill activities and other disturbances would be avoided in jurisdictional wetlands elsewhere in the Eastside/Airfield area.

4.10 NOISE

This section summarizes significant impacts from noise conditions, and proposes mitigation measures for each identified impact.

A. Standards of Significance

Projects impacts would be considered significant if they would:

- Place a new land use in an area where it would conflict with the land use compatibility noise exposure criteria shown in Table 3.10-4, or exceed the maximum allowable interior noise level for new multi-family housing set by HUD of DNL 45 dB.
- Create a substantial increase to existing ambient noise levels at a noise-sensitive land use (defined as a 3 dB increase in the DNL).
- Create construction noise levels of 70 dB $L_{eq\text{-}hour}$ or more at a sensitive receptor, or maximum noise levels greater than 95 dB at construction site property boundary.

B. Impact Discussion

As noted in Section 3.10, noise sources at Ames Research Center, including certain wind tunnels and aircraft operations, have created area-wide noise. This section evaluates the compatibility of these noise sources with proposed and existing land uses at Ames Research Center.

The area-wide effects of these sources are not discussed because no changes to these noise-generating facilities are proposed in any of the five alternatives, and the existing noise sources have been evaluated in other studies. The only long-term effect that development of the NASA Ames Development Plan could have on the noise environment in the area would result from increased vehicular traffic on the street network, which is addressed in Section B.2, below.

1. Compatible Land Use Development

Figure 4.10-1 superimposes combined noise exposure levels over land use proposed in Alternative 5 to show noise compatibility with proposed development under the NADP. Impacts under Alternatives 2 through 4 would be similar to those shown for Alternative 5 in Figure 4.10-1.

New development in the NRP area under Alternatives 2 through 5 could create significant land use incompatibilities, since all four propose the development of apartment-style housing and childcare on NRP Parcel 6, a small portion of which is exposed to a DNL of more than 65 dB. This is an unacceptable noise level for residential uses. Therefore, this small area would be used for parking or other non-residential uses.

Under Mitigated Alternative 5, a portion of Building 19 and all of Building 20 would be used for housing. Building 20 would be exposed to noise levels of 65 to 70 dB, which is considered conditionally acceptable by HUD and California Planning Guidelines. These noise levels are considered above the conditionally acceptable level for Santa Clara County. Building 19 would be exposed to noise levels of 70 to 75 dB, which is above California Planning Guidelines conditionally acceptable levels, but is still conditionally acceptable to HUD.

NRP Parcels 9, 10, 11, and 16 are located adjacent to Highway 101, where they are exposed to DNL exceeding 70 dB. Depending upon the ultimate use of these parcels, there could be significant noise impacts.

Under Alternatives 2, 4 and 5, new development is proposed in the Bay View area. In each alternative, proposed housing is located in an acceptable noise environment carefully sited outside the 65 dB noise contour from the wind tunnels and the airfield. Under Alternative 2, the use in Bay View Parcel 3, which includes the OARF facility, is not specified. Given the high-noise uses that have taken place in this area historically, there could be land use conflicts depending on the uses proposed for this parcel.

FIGURE 4.10-1

NOISE EXPOSURE FOR MITIGATED ALTERNATIVE 5

LEGEND:

- Partner Parcel
- Community Support
- University Reserve
- NASA Reserved
- Recreation
- Relocated AT Control Tower
- Housing - Bay View
- Housing - NRP*
- California Air and Space Center
- Historic District Infill
- Historic District Renovation
- Historic Buildings
- Computer Museum
- Supporting Retail
- Light Rail
- Preserve (Burrowing Owl)
- Open Space
- Wetlands
- Fence Line
- Bay Trail Extension

Denotes Parcel Number as Noted on Table 5.1-1

- Ames Campus
- NASA Research Park
- Eastside / Airfield
- Bay View

* A portion of Building 19 will remain offices

Composite Annual Ldn Noise Exposure Contours (dB)

DMJMH+N EDAW

0 76m 152m 305m
0 250ft 500ft 1000ft

NASA AMES RESEARCH CENTER
NASA AMES DEVELOPMENT PLAN FINAL EIS

Similarly, under Alternative 4 there are development parcels adjacent to the airfield whose uses are not specified. There could be noise exposure issues on these parcels, depending on the uses developed. In particular, portions of Bay View Parcel 7 would be exposed to a DNL exceeding 65 dB, rendering that parcel inappropriate for residential development. However, the planned use of Parcel 7 is a burrowing owl preserve. Under Alternatives 2, 4 and 5, childcare in the Bay View would be located in Parcel 2 which is located outside of the 60 dB contour. No adverse impact would be expected.

New development in the East Side/Airfield area proposed under Alternatives 2 through 5 would be located in acceptable noise environments, so there would be no incompatible land uses.

No information is available about the potential location of new development proposed in the Ames Campus area under Alternative 5. The location of the new uses could create land use incompatibilities if they are not carefully sited in regards to noise from the wind tunnels and airfield.

2. Traffic Noise

Increases in vehicular traffic noise along the street network in the project vicinity resulting from project-generated traffic were estimated by comparing future traffic volumes under the various development alternatives to existing traffic volumes in the area. This analysis was conducted for five key intersections, identified in the traffic study, where there could be a potential adverse noise effect. These intersections are:

- Middlefield Road at Shoreline Boulevard
- Moffett Boulevard at Central Expressway
- Moffett Boulevard at Middlefield Road
- Whisman Road at Middlefield Road
- Ellis Street at Middlefield Road

TABLE 4.10-1 **INCREASES IN TRAFFIC NOISE ABOVE BASELINE LEVELS - PROJECT + CUMULATIVE TRAFFIC (dB)[1]**

Intersection	Link	Alt.1	Alt. 2	Alt. 3	Alt. 4	Alt. 5*
Middlefield at Shoreline	SB	1.3	1.4	1.4	1.4	1.3
	WB	1.0	1.0	1.0	1.0	1.0
	NB	1.3	1.3	1.4	1.3	1.3
	EB	1.0	1.0	1.0	1.0	1.0
Moffett at Central	SB	1.4	1.4	1.4	1.4	1.0
	WB	1.7	2.2	2.1	2.4	1.9
	NB	1.4	1.5	1.4	1.5	1.4
	EB	1.9	2.2	2.0	2.3	2.0
Moffett at Middlefield	SB	1.5	1.6	1.6	1.6	1.5
	WB	1.0	1.3	1.3	1.5	1.2
	NB	1.7	1.8	1.9	2.1	1.8
	EB	1.2	1.5	1.4	1.5	1.3
Whisman at Middlefield	SB	1.5	1.7	1.5	1.8	1.5
	WB	3.0	3.0	3.0	3.0	3.0
	NB	1.8	2.0	1.8	2.1	1.9
	EB	1.4	1.4	1.4	1.4	1.4
Ellis at Middlefield	SB	1.7	1.7	1.8	2.0	1.8
	WB	2.7	3.2	3.3	3.2	3.0
	NB	2.2	2.6	2.6	2.6	2.4
	EB	–	–	–	–	--

1. Year 2013.

Note: Noise level increases are shown to the nearest 0.1 dB for comparison purposes only.

* No change is expected in Mitigated Alternative 5. See Section 5.4.

The PM peak hour was selected to determine the estimated change in the traffic noise environment. An increase in the average noise level $L_{eq\text{-}hour}$ of 3 dB or more as a result of the project-generated traffic would be expected to cause a similar increase in the DNL and would be considered a significant adverse effect. Table 4.10-1 shows the calculated future increases in traffic noise above existing levels along representative roadway segments. Alternative 1 is the future baseline. The contribution of project generated traffic noise to the total cumulative increase is the difference between the values shown for Alternative 1 and the other alternatives. Traffic generated by the proposed project would cause an increase of less than 1 dBA at all of the intersections studied, and thus would not result in a significant adverse impact at any sensitive receptors in the area.

3. Construction Noise

Implementation of the NASA Ames Development Plan will require demolition and construction activities, which will cause temporary increases in noise levels at Ames Research Center. The amount of noise generated will depend upon the type of demolition and construction activity, and the level of impact from the noise depends upon proximity of noise sensitive land uses. Typical construction noise levels are shown in Tables 4.10-2 and 4.10-3. The values in Table 4.10-3 indicate the range of average noise levels associated with different levels of activity.

Demolition or construction activities may intermittently affect adjacent land uses and Ames Research Center itself. Such construction disturbances would be intermittent and would be minimized through the appointment of a noise coordinator to deal with construction-related noise effects. These impacts would hence be considered less-than-significant.

TABLE 4.10-2 **NOISE LEVELS BY CONSTRUCTION PHASES**[1]

Activity	Housing I	Housing II	Office, Hotel, School, I	Office, Hotel, School, II	Parking Garage, Store I	Parking Garage, Store II	Roads, Highways, Sewers and I	Roads, Highways, Sewers and II
Ground Clearing	83	83	84	84	84	83	84	84
Excavation	88	75	89	79	89	71	88	78
Foundations	81	81	78	78	77	77	88	88
Erection	81	65	87	75	84	72	79	78
Finishing	88	72	89	75	89	74	84	84

Notes: I: All pertinent equipment present at site
II: Minimum required equipment present at site

1. Typical noise levels at 15 meters (50 feet) from construction sites measured L_{eq} in dBA.

Source: USEPA, Legal Compilation on Noise, Vol.1, p. 2-104, 1973.

C. Impacts and Mitigation Measures

Impact NOISE-1: Buildout of the NADP would potentially expose new land uses in the Bay View, NRP, and Ames Campus areas to existing noise sources at levels exceeding those considered normally acceptable for the intended use. Buildings 19 and 20, which are proposed for housing in Mitigated Alternative 5, would be in the 70 to 75 dB and 65 to 70 dB noise exposure areas, respectively.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure NOISE-1a: For development on NRP Parcels 2, 4, 9, 10, 11, 12, 12a and 16, and the Ames Campus, noise mitigation measures, including site planning to protect noise sensitive outdoor activity areas and building sound insulation treatments to protect noise sensitive indoor spaces, would be included in project design and development. Buildings would be designed to provide an appropriate Noise Level Reduction (NLR) depending upon the designated uses of the sensitive spaces.

Mitigation Measure NOISE-1b: Residential development proposed on Parcels 6, 12 and 12a would be designed so as to achieve an indoor DNL of 45 dB or less. The housing would be provided with forced-air mechanical ventilation or air-conditioning as necessary to achieve a habitable interior environment with the windows closed.

Impact NOISE-2: Buildout of the NADP would potentially expose new land uses in the Bay View area to existing noise sources at levels exceeding those considered normally acceptable for the intended use.

Applicable to: Alternatives 2, 4 and 5, and Mitigated Alternative 5

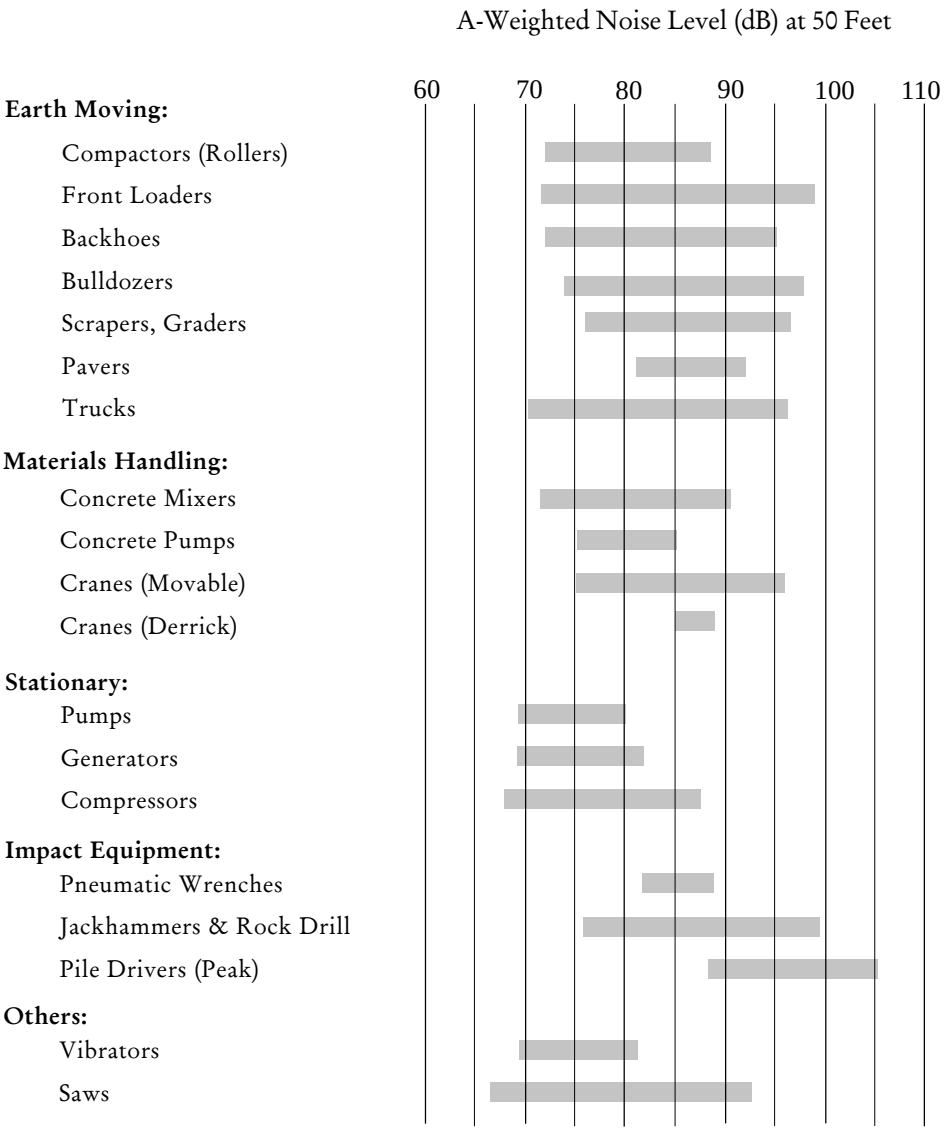
Mitigation Measure NOISE-2a: For development on parcels in the Bay View area near the OARF, noise mitigation measures including site planning to protect noise sensitive outdoor activity areas and building sound insulation treatments to protect noise sensitive indoor spaces would be included in project design and development. Buildings would be designed to provide an appropriate Noise Level Reduction (NLR) depending upon the designated uses of the sensitive spaces.

Mitigation Measure NOISE-2b: Once development occurs in the Bay View area, NASA would operate the OARF so that noise generated by it would not exceed the following levels when measured on any residential property:

	L_{max}	$L_{eq\text{-}hour}$
Daytime (7 am - 10 pm)	70	50
Nighttime (10 pm - 7 am)	65	45

TABLE 4.10-3

CONSTRUCTION EQUIPMENT NOISE LEVEL RANGE



Source: Illingworth & Rodkin

4.11 AESTHETICS

This section identifies potential impacts on the visual character of Ames Research Center, and on views within and through the Center from each of the five alternatives. It also proposes mitigation measures to reduce or eliminate identified impacts.

A. Standards of Significance

An alternative for the NASA Ames Development Plan (NADP) would have a significant impact with regard to aesthetics if it would:

- Substantially degrade the visual character or quality of ARC or its surroundings.
- Substantially obstruct significant public views or view corridors.
- Provide an unharmonious contrast with the visual character of surrounding areas.
- Require the removal of any protected trees as defined in Santa Clara County Ordinance No. NS-1203.107, §1, 2-11-97.

B. Impact Discussion

This section discusses the potential aesthetic impacts of each of the five proposed alternatives. As described in Section 3.11, Ames Research Center and its surrounding lands have a number of distinct visual units, each with its own character, landscaping, and typical uses. The analysis that follows describes potential impacts on those visual units under each of the five alternatives.

None of the new buildings have been designed yet, so it is not possible to describe their visual impacts with any certainty. However, rough setback, height and FAR information is available for each of the alternatives, so it is possible to predict building massing and thus to assess new buildings' potential to obstruct key views and view corridors, and to create too sharp a contrast between ARC and the areas that surround it.

The final part of this section describes potential impacts on protected trees.

1. Alternative 1: No Project

Under Alternative 1, there would be little to no effect on the aesthetic quality of any of the visual units within Ames Research Center. No new buildings would be constructed, and none of the existing buildings would be demolished except as established in the baseline. There would be no impacts on public views or view corridors. No new contrasts with surrounding areas would be created as viewed from outside the Center.

2. Alternative 2

As explained in Chapter 2, Alternative 2 proposes to place new development in the NRP, Bay View, and Eastside/Airfield areas, including the renovation of Hangars 2 and 3.

a. Visual Unit 1: Western End of Shenandoah Plaza

The only change in this visual unit would be the addition of a small, two-story structure in the south west corner. The historic character of Shenandoah Plaza would remain, and be protected by design guidelines for rehabilitation of existing buildings. New development in adjacent areas would be limited to no more than 12 meters (40 feet) in height, which would be compatible with existing structures. Thus there would be no significant impact on aesthetics in this visual unit under Alternative 2.

b. Visual Unit 2: Eastern End of Shenandoah Plaza

The visual character of this unit would change dramatically under Alternative 2. All of the existing non-historic buildings would be removed, and a approximately 32,000 square meters (345,000 square feet) of new development would be added between McCord and Severyns Avenues. The strip of land between Severyns Avenue and Cummins Road would be returned to greenspace, as under the original plan for Moffett Field.

New development would generally be under 12 meters (40 feet) in height in this visual unit, with a few taller buildings on the fringes of the Shenandoah

Plaza Historic District at the corner of Wescoat and Severyns, and at the corner of Bushnell and McCord. Building heights would be low enough to protect the view corridor down the central green of Shenandoah Plaza to Hangar 1. New design guidelines that would be adopted under any of the alternatives state that buildings within the Shenandoah Plaza Historic District would be designed in light, neutral colors with a palette of materials, massing, and fenestration compatible with the historic buildings. Setbacks in this visual unit would be small, with most buildings built up to the sidewalk edge to create a strong streetwall. This would give Visual Unit 2 a scale distinctly different from, but still compatible with, the intact sections of the Shenandoah Plaza Historic District to the west. Thus, there would be no significant visual impacts from development under Alternative 2.

c. Visual Unit 3: Southeastern Perimeter of the NRP Area

The visual character of this currently undeveloped strip of land along the southern and eastern perimeter of the NRP area would change substantially under Alternative 2. Currently undeveloped land just south of Hangar 1 would be developed with buildings up to 20 meters (65 feet) in height, with medium setbacks, opening up the view down Cody Road towards Hangar 1. This would block the existing panoramic views across the airfield. However, wide pedestrian and bicycle routes extending east/west across the NRP area would still provide view corridors to the airfield. In addition, the creation of a 9-hectare (22-acre) burrowing owl preserve immediately opposite Ellis Street would preserve a sweeping view of the airfield and historic hangars as part of the entrance experience to Ames Research Center. Thus while there would be substantial change in this visual unit, there would be no significant negative impacts on its visual character.

d. Visual Units 4 and 5: The Barracks and the Exchange Area

All of the existing structures in the Barracks and Exchange areas would be demolished. This visual unit would become the heart of the University district in the NRP area, with a perimeter of two- to four-story buildings surrounding large central open spaces. As described above, regularly-spaced bicycle and pedestrian corridors would provide view corridors across the NRP area. The

new design guidelines would ensure the quality and compatibility of new structures, which would be predominantly stone, concrete or masonry with no more than 30 per cent glass. The design guidelines also require that exterior building facades be articulated, and that the base of all buildings be designed to provide pedestrian interest. Thus while there would be substantial changes in these visual units, there would be no significant negative impacts on their visual character.

e. Visual Unit 6: Main Entry

There would be very little change in the visual quality of this area under Alternative 2. There could be some low-density development in NRP Parcel 16, as shown in Figure 2.2, but there would be no new development along Clark Memorial Drive. Thus there would be no significant impacts on the character of this visual unit.

f. Visual Unit 7: Ames Campus Area

Alternative 2 does not propose any new development within the Ames Campus area. The only impact on this visual unit would come from changes in character to the north and west as the Bay View area was developed, which would partially block views of the wetlands in the North of Bay View area. Unless view corridors were preserved in the new street layout in the Bay View area, this could be a significant impact.

g. Visual Unit 8: Bay View and North of Bay View

The visual character of the southern portion of this visual unit (the Bay View area) would change dramatically under Alternative 2. At present, the Bay View area is an almost entirely undeveloped expanse of ruderal land with expansive views of the rest of Ames Research Center. Under Alternative 2, there would be approximately 121,000 square meters (1.3 million square feet) of new development concentrated on approximately 14 hectares (34 acres) of land in the northwest portion of the visual unit. A belt of open space, some of it formal park area and some undeveloped land, including the 11-hectare (27-acre) burrowing owl preserve, would surround the development. This open space would buffer adjacent natural resources from development, and allow clear

views north across the Eastern and Western Diked marshes in the northern portion of this visual unit to the airfield and the salt ponds. There are no design guidelines, height restrictions, or setback requirements for the Bay View area at present. Thus new development there could cause significant impacts on the visual quality of this visual unit.

h. Visual Unit 9: Storm Water Retention Ponds

There would be no development in this visual unit under Alternative 2. It would continue to allow expansive views from the North of Bay View area out to the salt ponds and the East Bay Hills.

i. Visual Unit 10: The Airfield

No changes are proposed for the airfield under Alternative 2. It would continue to provide a huge view corridor in the heart of Ames Research Center, allowing views across the Center and out to the salt ponds.

j. Visual Unit 11: CANG Area

No development is proposed in the CANG area under Alternative 2. The visual character of this area will change slowly over time as the plans cleared under the CANG EA, described in Chapter 2, are implemented. New development in the NRP area would partially block the CANG area's views of Highway 101 and Mountain View, but this is not considered a significant view, and the coastal hills would still be visible. Thus there would not be significant impacts on the visual character of this unit from development proposed under Alternative 2.

k. Visual Unit 12: Hangars 2 and 3

There would be approximately 42,000 square meters (452,000 square feet) of new development in this visual unit spread out over approximately 13 hectares (31 acres), most of it in low-density, one- to two-story buildings on the north side of the hangars. The historic hangars would be rehabilitated for use as light industrial or low-density research and development space. There would also be a new control tower constructed at the southeast corner of Hangar 2. This would increase the number of low structures around the hangars, but would

not be sufficient to change the visual character of this unit which is set by the towering forms of the hangars. There would thus be no significant impacts on this visual unity from new development proposed under Alternative 2.

l. Visual Unit 13: The Golf Course and Munitions Bunkers

Under Alternative 2, the aesthetic character of this visual unit would change somewhat. There would be approximately 9,000 square meters (98,000 square feet) of new development on a 4.0-hectare (9.8-acre) parcel currently occupied by one hole of the golf course on the east side of Macon Road. The low-density of this development would prevent it from substantially affecting views across the airfield to the western side of Ames Research Center. The northern area of Visual Unit 12 would be established as a burrowing owl preserve. The dominant visual feature in this area is the golf course, and it would be maintained in similar form. Thus there would be no significant impacts on the character of this visual unit from new development proposed under Alternative 2.

m. Visual Unit 14: Berry Court Military Housing Area

Alternative 2 does not propose any development for the Berry Court Military Housing area, which is outside the boundaries of Ames Research Center. However, new housing proposed on NRP parcel 6 could impact the character of this visual unit. Apartment-style housing in buildings up to five stories high would be built in a strip paralleling the eastern edge of the housing area, where buildings are only two-stories tall. This would be a substantial difference in height, and could significantly impact the visual quality of the Berry Court Military Housing area, which is currently dominated by trees and low buildings.

n. Visual Unit 15: The Orion Park Military Housing Area

Alternative 2 does not propose any development for the Orion Park Military Housing area, which is outside the boundaries of Ames Research Center. No new development is proposed in the Ames Campus area, which is the only part of Ames Research Center visible from Orion Park. Thus there would be no

significant impacts on the character of this visual unit from development proposed under Alternative 2.

o. Visual Unit 16: Military Office and Hotel Buildings

Alternative 2 does not propose any development for this visual unit, which is outside the boundaries of Ames Research Center. No new development is proposed in the adjacent Ames Campus area, or in the portion of the Shenandoah Plaza or Main Gate areas that are visible from this visual unit. Thus there would be no significant impacts on the character of this visual unit from development proposed under Alternative 2.

p. Visual Unit 17: Undeveloped Land to the West

This narrow strip of undeveloped land immediately west of the border of Ames Research Center would be slightly affected by new development proposed in the Bay View area under Alternative 2. If this new development were very tall, it could block views from the trail along the Stevens Creek berm across Ames Research Center for some distance. This would be considered a significant impact because it could block significant views from a public right-of-way. The remainder of this area is on the other side of the berm, and would not be visually affected by any new development proposed under Alternative 2.

q. Visual Unit 18 and 19 : Office/Industrial Park to the West and Mobile Home Park

The majority of new development proposed at Ames Research Center would not be visible from adjacent portions of either the office or mobile home area because of the perimeter vegetation and the tall berm along Stevens Creek. Depending on the height of new buildings, however, some of the new development in the Bay View area could be visible over the top of the berm. There is a remote chance that new development would block views of Hangars 2 and 3 from these two visual units, but even if this did occur, it would not be considered a significant impact because private views are not protected under NEPA (42 U.S.C. 4321 *et seq.*). However, it would be appropriate for NASA to consider views into Ames Research Center when siting new buildings and deciding on height restrictions in the Bay View area.

r. Visual Unit 20: North to the San Francisco Bay

The northern perimeter of Ames Research Center would be left undeveloped under Alternative 2. The only change would be the potential future construction of the Bay Trail on the easement NASA would grant under the baseline. Looking at Ames Research Center from this visual unit, development would be clustered in or adjacent to already built up areas, and would for the most part be low enough not to be visible from long distances. Thus no significant impact on the character of this visual unit would be created under Alternative 2.

s. Visual Unit 21: The Lockheed Martin Complex

In the Lockheed Martin complex, there are buildings quite close to the western perimeter of Ames Research Center that have sweeping views over the Center. New development proposed under Alternative 2 would not significantly impact any of the important views of the hangars, wind tunnels or the Bay from these buildings.

t. Visual Units 22 Through 25: Development Across Highway 101

Some of the taller development proposed in the NRP area under Alternative 2 would be visible from these visual units, especially the proposed cluster of 20- to 24-meter (65- to 80-foot) tall buildings around Ellis Circle and the proposed structured parking along the Highway 101 frontage. From a few points, these new buildings could partially block views of the historic hangars. The only public view that could be affected would be the view north along Whisman Street. If any of the proposed parking garages or the buildings at Ellis Circle were located on axis with Whisman Street, and they blocked views of Hangar 1, this would be a significant impact.

3. Alternative 3

Under Alternative 3, new development would be concentrated within the NRP area. In addition, Hangars 2 and 3 would be renovated.

a. Visual Units 1-6: The NRP Area

Within the NRP area, the impacts from new development under Alternative 3 would be substantially similar to those described above under Alternative 2. There would be approximately 92,900 square meters (1 million square feet) more development in the NRP area under Alternative 3, and thus a substantially higher density, along with a New Urbanist "Traditional Neighborhood Design" style. Thus there would be no significant negative impacts on the characters of any of these visual units under Alternative 3.

b. Visual Unit 7: The Ames Campus area

As under Alternative 2, there would be no new development in this visual unit, and none of the proposed development in the NRP area would impact it either. Unlike Alternative 2, there would be no new development in Bay View, so views to the north would remain unchanged. There would thus be no significant impacts on the visual character of the Ames Campus area under Alternative 3.

c. Visual Unit 8: Bay View and North of Bay View

There would be no new development in this visual unit or in areas adjacent to it under Alternative 3, so there would be no significant visual impacts.

d. Visual Unit 9: Stormwater Retention Ponds

There would be no new development in or adjacent to this visual unit under Alternative 3, so there would be no significant visual impacts on it from implementation of the NADP.

e. Visual Units 10 through 13: Eastside/Airfield

There would be no new development in these visual units or in currently undeveloped areas adjacent to them, and renovation of the hangars would not affect their outer appearance. While development in the NRP area would become denser, it would not affect the character of the Eastside/Airfield area because the airfield itself provides a large buffer zone. Thus there would be no significant impacts on this visual unit from new development proposed under Alternative 3.

f. Visual Unit 14: Berry Court Military Housing Area

As under Alternative 2, there could be a significant impact on the character of this visual unit as a result of up to five-story tall dormitories planned for NRP parcel 6. This would be a substantial difference in height from the existing two-story buildings in the housing area, and could significantly impact its visual quality, which is currently dominated by trees and low buildings.

g. Visual Units 15 and 16: Orion Park Military Housing Area and Military Offices

There would be no visual impacts on these units because none of the development proposed under Alternative 3 would be visible from them.

h. Visual Units 17 through 19: Office and Mobile Home Parks

There would be no visual impacts on these units because none of the development proposed under Alternative 3 would be visible from them.

i. Visual Units 20 and 21 : North to the San Francisco Bay, and the Lockheed Martin Complex

There would be no visual impacts on either of these units because development in the NRP under Alternative 3 would be far enough away that it would not block any significant views.

j. Visual Units 23 through 25: Across Highway 101

As under Alternative 2, some of the taller buildings in the NRP area proposed under Alternative 3 would be visible from these visual units, especially the proposed cluster of 20- to 24-meter (65- to 80-foot) tall buildings around Ellis Circle and the proposed structured parking along the Highway 101 frontage. From a few points, these new buildings could partially block views of the historic hangars. The only public view that could be affected would be the view north along Whisman Street. If any of the proposed parking garages or the buildings at Ellis Circle were located on axis with Whisman Street, and they blocked views of Hangar 1, this would be a significant impact.

4. Alternative 4

Alternative 4 proposes the development of new space in the NRP, Bay View, and Eastside/Airfield areas including the renovation of Hangars 2 and 3.

a. Visual Units 1-6: The NRP Area

Within the NRP area, the impacts from new development under Alternative 4 would be substantially similar to those described above under Alternative 2. The same design guidelines, height restrictions and setbacks would apply under both alternatives, but there would be approximately 46,000 square meters (500,000 square feet) less development under Alternative 4 than under Alternative 2, and thus a somewhat lower density and greater amount of new open space. There would be no significant impacts on the characters of any of these visual units under Alternative 4.

b. Visual Unit 7: Ames Campus Area

Alternative 4 does not propose any new development within the Ames Campus area. The only impact on this visual unit would come from changes in character to the north and west as the Bay View area was developed, which would block views of the wetlands in the North of Bay View area. Unless view corridors were preserved in the new street layout in the Bay View area , this could be a significant impact.

c. Visual Unit 8: Bay View and North of Bay View

As under Alternative 2, the visual character of the southern portion of this visual unit (the Bay View area) would change dramatically under Alternative 4. At present, the Bay View area is an almost entirely undeveloped expanse of ruderal land with expansive views of the rest of Ames Research Center. Under Alternative 4, there would be approximately 251,000 square meters (2.7 million square feet) of new development covering much of the planning area. A narrow belt of open space would buffer adjacent natural resources from development, but would not allow expansive views north across the Eastern and Western Diked marshes and the airfield. There are no design guidelines, height restrictions, or setback requirements for the Bay View area at present.

Thus new development under Alternative 4 there could cause significant impacts on the visual quality of the Bay View area.

No new development is proposed for the northern portion of this visual unit, the Eastern and Western Diked marshes, so they would continue to allow open views of the stormwater retention ponds, the airfield, and the East Bay Hills.

d. Visual Units 10 and 11: The Airfield and CANG Areas

As described above under Alternative 2, no changes are proposed for the airfield or the CANG area under Alternative 4, so there would no be significant impacts on the visual character of either of these units from development proposed under Alternative 4.

e. Visual Unit 12: Hangars 2 and 3

There would be approximately 53,000 square meters (570,000 square feet) of new development in this visual unit spread out over approximately 13 hectares (31 acres). As under Alternative 2, most of the new development would be in low-density, one- to two-story buildings on the north side of the hangars, although a new control tower would also be constructed at the southeast corner of Hangar 2. The historic hangars would be rehabilitated for use as light industrial or low-density research and development space. This would increase the number of low structures around the hangars, but would not be a sufficient to change the visual character of this unit which is set by the towering forms of the hangars. There would thus be no significant impacts on this visual unity from new development proposed under Alternative 4.

f. Visual Unit 13: The Golf Course and Munitions Bunkers

As under Alternative 2, the aesthetic character of this visual unit would change somewhat with the development of just under 9,300 square meters (100,000 square feet) of space on the east side of Macon Road. The low-density of this development would prevent it from substantially affecting views across the airfield to the western side of Ames Research Center. As under Alternative 2, the northern area of Visual Unit 13 would be established as a burrowing owl preserve. The dominant visual feature in this area is the golf course, and it

would be maintained in similar form. Thus there would be no significant impacts on the character of this visual unit from new development proposed under Alternative 4.

g. Visual Unit 14: Berry Court Military Housing Area

Alternative 4 does not propose any development for the Berry Court Military Housing area, which is outside the boundaries of Ames Research Center. However, new housing proposed on NRP parcel 6 could impact the character of this visual unit. There would be only about 25,000 square meters (265,000 square feet) of apartment-style housing under this alternative, rather than 33,000 (360,000) as under Alternatives 2 and 3. This should allow for lower buildings, although the height allowed on the parcel would still be up to 20 meters (65 feet). If four- or five-story buildings containing apartment-style housing were constructed, they would be substantially different in height from the two-story buildings in the Berry Court area. Although impacts would most likely be less than under Alternatives 2 or 3, development proposed under Alternative 4 could significantly impact the visual quality of the Berry Court Military Housing area.

h. Visual Units 15 and 16: Orion Park Military Housing Area and Military Offices

There would be no visual impacts on these units because none of the development proposed under Alternative 4 would be visible from them.

i. Visual Unit 17: Undeveloped Land to the West

The narrow strip of undeveloped land immediately west of the border of Ames Research Center could be affected by new development proposed in the Bay View area under Alternative 4. If this new development were very tall, it could block views from the Stevens Creek Trail across Ames Research Center for some distance, which would be a significant impact because the Trail is public right-of-way. The remainder of this visual unit is on the other side of the berm, and would not be visually affected by any new development proposed under Alternative 4.

j. Visual Units 18 and 19 : Office/Industrial Park to the West and Mobile Home Park

The majority of new development proposed at Ames Research Center would not be visible from adjacent portions of either the office or mobile home area because of the perimeter vegetation and the tall berm along Stevens Creek. Depending on the height of new buildings, however, some of the new development in the Bay View area could be visible over the top of the berm. There is a chance that new development would block views of Hangars 2 and 3 from these two visual units, but even if this did occur, it would not be considered a significant impact because private views are not protected under NEPA. However, it would be appropriate for NASA to consider views into Ames Research Center when siting new buildings and deciding on height restrictions in the Bay View area.

k. Visual Unit 20: North to the San Francisco Bay

The northern perimeter of Ames Research Center would be left undeveloped under Alternative 4. The only change would be the potential future construction of the Bay Trail on the easement NASA would grant under this alternative. Looking at Ames Research Center from this visual unit, development would be clustered in or adjacent to already built up areas, and would for the most part be low enough not to be visible from long distances. Thus no significant impact on the character of this visual unit would be created under Alternative 4.

l. Visual Unit 21: The Lockheed Martin Complex

In the Lockheed Martin complex, there are buildings quite close to the western perimeter of Ames Research Center that have sweeping views over the Center. New development proposed under Alternative 4 would not significantly impact any of the important views of the hangars, wind tunnels or the salt ponds from these buildings.

m. Visual Units 22 Through 25: Development Across Highway 101

Some of the taller development proposed in the NRP area under Alternative 4 would be visible from these visual units, especially the proposed cluster of 20-

to 24-meter (65- to 80-foot) tall buildings around Ellis Circle and the proposed structured parking along the Highway 101 frontage. From a few points, these new buildings could partially block views of the historic hangars. The only public view that could be affected would be the view north along Whisman Street. If any of the proposed parking garages or the buildings at Ellis Circle were located on axis with Whisman Street, and they blocked views of Hangar 1, this would be a significant impact.

5. Alternative 5

Alternative 5 proposes new development within all four of the planning areas, including the Ames Campus area.

Although development totals and densities would vary slightly from Alternative 2, Alternative 5's potential impacts would be substantially similar between these two alternatives, with the following differences:

- Visual Unit 7: Ames Campus. Under Alternative approximately 37,000 square meters (400,000 square feet) of existing development would be demolished and replaced with approximately 46,000 square meters (500,000 square feet) of new space. There are no design guidelines, height limits, or set back requirements for this new development. As a result, it could conflict with the existing austere industrial park character of the existing development. Depending on the height and placement of the new facilities, they could block existing views within the Ames Campus area. Both of these potential impacts under Alternative 5 would be considered significant.
- Visual Unit 12: Hangars 2 and 3. No new development would occur on the north side of the hangars, so the impacts described for Alternative 2 would not occur. There would be no significant impact on the character of this visual unit.
- Visual Unit 13: The Golf Course and Munitions Bunkers. There would be no new development in this area under Alternative 5. There would still be no significant impact on the character of this visual unit

6. Protected Trees

As described in Chapter 3.11 and shown in Figures 3.11-26 through 3.11-28, there are protected trees, as defined by Santa Clara County, in the Ames Campus, NRP, and Eastside/Airfield areas. This section analyzes any potential impacts on those trees from the five proposed alternatives.

a. Alternative 1

Under Alternative 1, there would be no development beyond baseline conditions, as described in Chapter 2. There would thus be no impacts on protected trees under Alternative 1.

b. Alternative 2

Alternative 2 does not propose any new development in the Ames Campus area, so there would be no conflict with protected trees there.

In the Shenandoah Plaza Historic District, most of the infill development proposed under Alternative 2 would be located on parcels without any protected trees. The one exception would be NRP Parcel #14, where there are a number of protected trees on the eastern end of the parcel. However, it would be possible to avoid all of the existing protected trees through careful siting of the proposed development.

Within the remainder of the NRP area, it would probably not be possible to avoid conflicts with all of the existing protected trees. The main cause of this would be the reconfiguration of roadways proposed under Alternative 2. Many of the protected trees line existing streets, so it would not be possible to keep them all in place without dividing the proposed parcels into unbuildable shapes. In addition, another substantial group of protected trees grow around buildings that would be demolished under Alternative 2. It may be difficult to preserve these trees given how close they are to structures that would be removed.

In the Eastside/Airfield area, protected trees are only located within the golf course and around the southernmost part of the CANG buildings. Alternative

2 proposes development of a building on Eastside/Airfield Parcel #5, which is located on the most western hole of the golf course. This would almost certainly require the removal of a number of protected trees as they are clustered along the middle of the central axis of the parcel.

The potential loss of protected trees in the NRP and Eastside/Airfield areas under Alternative 2 would be considered a significant impact.

c. Alternative 3

Alternative 3 does not propose any redevelopment in the Ames Campus area, so there would be no conflict with protected trees there.

In the Shenandoah Plaza Historic District, most of the infill development proposed under Alternative 3 would be located on parcels without any protected trees. As under Alternative 2, the one exception would be NRP Parcel #14, but it would be possible to avoid all of the existing protected trees on the parcel through careful siting of the proposed development.

Within the remainder of the NRP area, it would not be possible under Alternative 3 to avoid conflicts with all of the existing protected trees. As described above under Alternative 2, the main cause of this is the proposed reconfiguration of roadways, many of which are lined with protected trees. In addition, protected trees immediately adjacent to buildings slated for demolition under Alternative 3 could be difficult to preserve.

In the Eastside/Airfield area, there would be no conflict with protected trees under Alternative 3.

The loss of protected trees in the NRP area under Alternative 3 would be considered a significant impact.

d. Alternative 4

Alternative 4 does not propose any redevelopment in the Ames Campus area, so there would be no conflict with protected trees there.

As under Alternatives 2 and 3, most of the infill development proposed under Alternative 4 in the Shenandoah Plaza Historic District would be located on parcels without any protected trees. The one exception would be NRP Parcel #14, but it would be possible to avoid all of the existing protected trees through careful siting of the proposed development.

Within the remainder of the NRP area, it would not be possible to avoid conflicts with all of the existing protected trees under Alternative 4. The main causes of this, described in more detail above, would be the proposed reconfiguration of roadways and demolition of buildings, many of which are lined by protected trees.

In the Eastside/Airfield area, Alternative 4, like Alternative 2, proposes development of a building on Eastside/Airfield Parcel #5, which is located on the most western hole of the golf course. This would almost certainly require the removal of a number of protected trees as they are clustered along the middle of the central axis of the parcel.

The loss of protected trees in the NRP and Eastside/Airfield areas under Alternative 4 would be considered a significant impact.

e. Alternative 5

Unlike the other four alternatives, Alternative 5 proposes the demolition of existing buildings and new construction in the Ames Campus area. The exact location of the areas proposed for redevelopment within the Ames Campus area have not been specified. However, as described in Chapter 3.11, protected trees in the Ames Campus area are mostly clustered along roads and within planting strips in parking lots, and so would not be affected by the proposed redevelopment. There are some protected trees around existing buildings, but it would be possible to avoid them through careful siting of demolition and construction activities.

As under Alternatives 2 through 4, most of the infill development proposed under Alternative 5 in the Shenandoah Plaza Historic District, would be

located on parcels without any protected trees. The one exception would be NRP Parcel #14, where there are a number of protected trees on the eastern end of the parcel. However, it would be possible to avoid all of the existing protected trees through careful siting of the proposed development.

Within the remainder of the NRP area, it would not be possible to avoid conflicts with all of the existing protected trees under Alternative 5. As described above in more detail under Alternative 2, the main causes of the removal of protected trees would be the reconfiguration of the road network and the demolition of buildings.

In the Eastside/Airfield area, there would be no conflict with existing protected trees under Alternative 5.

The loss of protected trees in the NRP area under Alternative 5 would be considered a significant impact.

7. Cumulative Impacts

The development any of the Alternatives 2 through 5 would result in a substantial change to the character of the ARC, as described above. However, since the aesthetic change would largely be an improvement, no significant cumulative adverse impacts would result from the project. There would not be a cumulative impact with respect to aesthetics when the NADP project is combined with other proposed projects in the area since the other projects are not located adjacent to the ARC, and each of those projects would be evaluated individually for compliance with the City of Sunnyvale and/or City of Mountain View design guidelines.

There could be significant cumulative visual impacts within the ARC if baseline development and the proposed project combined to remove a substantial number of protected trees in the NRP area, where baseline development is located.

C. Impacts and Mitigation Measures

This section summarizes significant impacts identified in Section B, and proposes mitigation measures for each identified impact.

Impact AES-1: The lack of design guidelines, height limits, and setback requirements for the Bay View, Ames Campus, and Eastside/Airfield areas could allow future development to create too stark a contrast in terms of height, density, or architectural style.

Applicable to: Alternatives 2, 4 and 5, and Mitigated Alternative 5

Mitigation Measure AES-1: NASA and its partners would develop design guidelines for the Bay View, Ames Campus and Eastside/Airfield areas in order to ensure that new buildings would stylistically complement the existing buildings in the Ames Campus and Eastside/Airfield. Design guidelines for the Bay View area would include setback requirements for Stevens Creek and Western Diked Marsh, and would ensure harmonious design.

Impact AES-2: The allowed four- to six-story height of proposed student apartments on NRP parcel 6 could conflict with the prevailing low heights in the adjacent Berry Court Military Housing area.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure AES-2: This parcel is not large enough to hold a sufficient number of housing units if allowed heights were reduced. The visual effect would be mitigated through a combination of landscaping, screening and overall design.

Impact AES-3: Proposed new parking structures along the Highway 101 frontage and new four- to five- story buildings around Ellis Circle could block views into and across Ames Research Center from areas across Highway 101 in

Mountain View, especially the existing view corridor along Whisman Street.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure AES-3: In order to prevent the obstruction of key views of the hangars and the wind tunnels in Ames Research Center from the areas of Mountain View and Sunnyvale across Highway 101, buildings in the NRP area would be carefully sited to preserve view corridors through the new development, especially from the Whisman Street corridor.

Impact AES-4: New development in the Bay View area could block views from the Ames Campus area into the wetlands area in North of Bay View and to the salt ponds beyond.

Applicable to: Alternatives 2, 4 and 5, and Mitigated Alternative 5

Mitigation Measure AES-4: As the site plan for new development in the Bay View area was developed, NASA and its partners would design the new street layout to preserve view corridors through the new development to the North of Bay View area and the salt ponds.

Impact AES-5: New development in the Bay View area could block views from the Stevens Creek Trail of the historic hangars and the San Francisco Bay.

Applicable to: Alternatives 2, 4 and 5, and Mitigated Alternative 5

Mitigation Measure AES-5: NASA and its partners would use site layout to preserve view corridors from the Stevens Creek Trail through new development in Bay View to the historic hangars and to the San Francisco Bay.

Impact AES-6: Proposed development within the Ames Campus area under Alternative 5, in the NRP area under Alternatives 2 through 5 and in the

Eastside/Airfield area under Alternatives 2 and 4 could require the removal of protected trees.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure AES-6a: Where possible, NASA and its partners would carefully site any development so as to preserve the protected trees.

Mitigation Measure AES-6b: Where it is not possible to preserve protected trees in place, NASA and its partners would develop a revegetation plan consistent with the requirements of the Santa Clara County Tree Preservation and Removal Ordinance.

4.12 RECREATION

This section identifies potential impacts on recreational land uses at Ames Research Center and its immediate surroundings from each of the five alternatives. This section also proposes mitigation measures to reduce or eliminate identified impacts.

A. Standards of Significance

An alternative for the NASA Ames Development Plan (NADP) would have a significant impact with regard to recreational uses if it would:

- Impact the quality of existing recreational resources.
- Substantially reduce the amount of active recreation or passive recreation area within Ames Research Center, thus leading to an increase in use of surrounding recreational areas by people living or working at the Center.

B. Impact Discussion

This section discusses the potential recreational impacts of each of the five proposed alternatives. Parkland calculations are shown in Table 4.12-1.

1. Quantity of New and Existing Parkland

a. Alternative 1

Under Alternative 1, there would be no change from the baseline in the quantity of the existing recreational resources at Ames Research Center because there would be no new development.

b. Alternative 2

Under Alternative 2, approximately 4.7 hectares (11.5 acres) of park space would be added in the NRP Area, as well as 4.6 hectares (11.4 acres) of new active recreation space in the Bay View area for a total of 9.3 hectares (22.9 acres). The passive open space in the Bay View area, part of which is used for

TABLE 4.12-1 **PARKLAND CALCULATIONS**

	Alternative					
	1	2	3	4	5	Mit. Alt.5*
Proposed New Parkland hectares (acres)	0	9.3 (22.9)	4.7 (11.5)	7.6 (18.9)	14.1 (34.9)	14.1 (34.9)
New Residents	0	2,009	1,266	2,574	2,808	4,909
Demand Rate	1.2 hectares (3 acres) per 1,000 residents					
New Demand hectares (acres)	0	2.4 (6.0)	1.5 (3.8)	3.1 (7.7)	3.4 (8.4)	5.9 (14.7)
New Employees	0	13,068	11,047	15,599	7,222	7,088
Demand Rate	0.6 hectares (1.5 acres) per 1,000 employees					
New Demand hectares (acres)	0	7.8 (19.6)	6.7 (16.5)	9.4 (23.4)	4.3 (10.8)	4.3 (10.6)
Total New Demand hectares (acres)	0	**10.2 (25.6)**	**8.2 (20.3)**	**12.5 (31.1)**	**7.7 (19.2)**	**10.2 (25.3)**
Surplus or Deficit hectares (acres)	0	**-0.9 (-2.7)**	**-3.5 (-8.8)**	**-4.9 (-12.2)**	**6.4 (15.7)**	**3.9 (9.6)**

* For a full analysis of Mitigated Alternative 5, see Chapter 5.

walking, would decrease by 20.4 hectares (50.5 acres), leaving a total of approximately 17.8 hectares (43.9 acres) of open space. Given the amount of available walking space remaining, however, this would not constitute a significant impact.

Under Alternative 2, no additional active parkland would be lost. However, under this alternative, one hole of the golf course would be removed to accommodate the Regional Disaster Training Center. This would be a significant impact unless the golf course were reconfigured.

Alternative 2 would add new residents and employees, who would generate a total demand for 10.2 hectares (25.6 acres) of new parkland, using a standard demand rate of 1.2 hectares (3.0 acres) per 1,000 residents and 0.6 hectares (1.5 acres) per 1,000 employees. Alternative 2 would supply 9.3 hectares (22.9 acres) of new parkland for a deficit of 0.9 hectares (2.7 acres).

c. Alternative 3

Under Alternative 3, new development would be concentrated entirely in the NRP area, and there would be 4.7 hectares (11.5 acres) of new park space built. None of the existing open space in the Bay View area, which is currently used by employees for walking, would be removed. Alternative 3 would add new residents and employees, who would generate a total demand for 8.2 hectares (20.3 acres) of new parkland. Alternative 3 would thus generate a parkland deficit of 3.5 hectares (8.8 acres).

d. Alternative 4

Under Alternative 4, approximately 4.7 hectares (11.5 acres) of park space would be added to the NRP area, as well as approximately 3.0 hectares (7.4 acres) of active recreational space in Bay View, for a total of 7.6 hectares (18.9 acres). Approximately 32.9 hectares (81.2 acres) of existing undeveloped land in the Bay View area would be developed, leaving a total of approximately 5.4 hectares (13.4 acres) of open space. Given the amount of available walking space remaining, however, this would not constitute a significant impact.

Under Alternative 4, no additional active parkland would be lost. However, under this alternative, one hole of the golf course would be removed to accommodate the Regional Disaster Training Center. This would be a significant impact unless the golf course were reconfigured.

Alternative 4 would add new residents and employees, who would generate a total demand for 12.5 hectares (31.1 acres) of new parkland. Alternative 4 would supply 7.6 hectares (18.9 acres) of new parkland for a deficit of 4.9 hectares (12.2 acres).

e. Alternative 5

Alternative 5 proposes the addition of approximately 6.4 hectares (15.7 acres) of new park space to the NRP area, as well as approximately 4.6 hectares (11.4 acres) of new active recreational space in the Bay View area and approximately 3.2 hectares (7.8 acres) in the Ames Campus area for a total of 14.1 hectares (34.9 acres).

Approximately 15.9 hectares (39.4 acres) of existing undeveloped land in the Bay View area would be developed, leaving a total of approximately 22.35 hectares (55.23 acres) of passive open space, which would continue to accommodate trails and walking. Given the amount of available walking space remaining, this would not constitute a significant impact. No additional active parkland would be lost under this alternative.

Alternative 5 would add new residents and employees, who would generate a total demand for 7.7 hectares (19.2 acres) of new parkland. Alternative 5 would supply 14.1 hectares (34.9 acres) of new parkland for a surplus of 6.4 hectares (15.7 acres).

2. Quality of Existing and New Parks at Ames Research Center

There would be no negative effects on the quality of any existing or proposed parks or open spaces, except for temporary noise impacts due to construction.

3. Cumulative Impacts

The cumulative projects listed in Chapter 2 would bring new employees and residents to the region. These people would be able to use the many regional recreational facilities described in Section 3.12. Given the large supply of existing recreational sites, no cumulative impacts on recreation are expected.

Moreover, the NADP would include a surplus of recreational lands, so it would not add to any cumulative impact that might occur.

C. Impacts and Mitigation Measures

This section lists the mitigation measures for each potential impact discussed above.

Impact REC-1: Alternatives 2 through 4 would not supply enough new recreational space to meet demands generated by new employees and residents.

Applicable to: Alternatives 2 through 4

Mitigation Measure REC-1: NASA and/or its partners would develop additional active recreation areas in development areas on the ARC site to meet recreation demands generated by new employees and residents.

Impact REC-2: Alternatives 2 and 4 would result in removal of one hole from the golf course to accommodate the Regional Disaster Training Center.

Applicable to: Alternatives 2 and 4

Mitigation Measure REC-2: The golf course would be reconfigured to accommodate a full 18 holes.

4.13 CULTURAL RESOURCES

This section identifies potential impacts on the cultural resources, archaeological and historic, within Ames Research Center from each of the five alternatives, and proposes mitigation measures to reduce or eliminate identified impacts.

A. Standards of Significance

An alternative for the NASA Ames Development Plan (NADP) would have a significant impact with regard to the cultural resources at Ames Research Center if it would:

- Affect known or potential archaeological resources through ground disturbance.
- Damage, destroy, or significantly affect the integrity of any of the contributing elements on or eligible for the National Register of Historic Places.

B. Impact Discussion

As described in Chapter 3 of this EIS, although ten prehistoric and historic archaeological sites were discovered and formally recorded on or near the current site of Ames Research Center early in this century, it is no longer possible to find evidence of any of the sites that lay within the Center itself. They appear to have been seriously disturbed or destroyed by agriculture, fill, and development over the course of the century.[1,2] It is possible, however, that one of these lost sites could be rediscovered during construction or demolition activities associated with implementation of the NADP, or that previously unknown remains could be uncovered.

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[1] Basin Research Associates. *Archaeological Overview and Survey*. 1991

[2] SAIC. *NASA Ames Research Center Preliminary Draft Historic Resources Protection Plan*. September 1999.

The Shenandoah Plaza Historic District is the primary group of historic resources within Ames Research Center, as described in Chapter 3 of this EIS. The buildings, landscapes, and objects included in the Shenandoah Plaza Historic District are eligible for listing on the National Register of Historic Places (NRHP) because of their association with lighter-than-air technology during the inter-war period between 1932 and 1945, and because of their distinctive site plan and Spanish Colonial Revival architecture. The Unitary Plan Wind Tunnel is on the NRHP. Building N-200, the 40- by 80-Foot Wind Tunnel (N221) and the 6- by 6-foot Supersonic Wind Tunnel (N-226) are being nominated for the NRHP because of their associations with the development of American aeronautics and space flight.

1. Shenandoah Plaza Historic District

To comply with historic preservation requirements set forth in Section 106 and 110 of the National Historic Preservation Act of 1966, NASA has prepared an Historic Resources Protection Plan (HRPP) for the Shenandoah Plaza Historic District. Among the objectives of the HRPP is to provide for the protection and treatment of historic properties by establishing guidelines for new construction within the Shenandoah Plaza Historic District, and for the repair, maintenance, rehabilitation, alteration, reuse and leasing of historic resources within the District. The HRPP is published as Appendix G of this EIS.

The HRPP sets out nine preservation management goals and policies for the Shenandoah Plaza Historic District. The HRPP also categorizes all properties within the District following a system of National Register Treatment Categories based on those developed by various branches of the Department of Defense. National Registry eligibility has been determined for all Shenandoah Plaza buildings, yet within this group there is flexibility for determining treatment categories. Each of the four treatment categories proposes a particular level of preservation treatment suitable for the significance of the resources within it. The HRPP states that all undertakings that may affect the Historic District shall implement treatments as outlined in the Plan.

The HRPP outlines stipulations for lease agreements and special event licenses for all contributing and non-contributing buildings within the Shenandoah Plaza Historic District. Procedures for the unexpected discovery of cultural resources are also outlined to ensure that all unidentified buried archaeological resources are properly identified, evaluated and treated (if necessary). Furthermore, the HRPP provides design guidelines for new construction within the Shenandoah Plaza Historic District to avoid incompatible uses, inappropriate locations of new buildings, and visually incompatible designs. The design of any new construction must be coordinated with the State Office of Historic Preservation. Architectural guidelines for the repair, maintenance, rehabilitation, alteration, and reuse of contributing buildings within the District have been prepared by NASA and have been integrated into the HRPP as an addendum.

Under the HRPP, the Shenandoah Plaza Historic District would be treated as follows:

- Under Alternative 1, all historic buildings within Ames Research Center would be preserved. No infill development would be constructed within the Historic Districts, so there would be no impact on their visual integrity.
- Under Alternatives 2 through 5, no historic buildings within Ames Research Center would be demolished. Almost all of the non-historic infill buildings within the Historic District would be removed, and a strip of land running parallel to Hangar 1 would be restored to open space as in the original site plan for Moffett Field. This would substantially improve the integrity and coherence of the Shenandoah Plaza Historic District. A limited number of infill buildings would be constructed within the Shenandoah Plaza Historic District, which could have an impact on its visual integrity if they were not designed carefully to ensure their compatibility with historic architecture.
- Under Alternatives 2 through 5, many of the historic buildings within the Shenandoah Plaza Historic District would be rehabilitated to make them

suitable for reuse. These actions could disturb the integrity of the original buildings, creating significant impacts on the historical integrity of the contributing buildings.

2. Historic Buildings within the Ames Campus

Under all of the proposed alternatives, there would be no impacts on any of the buildings listed or eligible for listing on the National Register of Historic Places within the Ames Campus.

3. Cumulative Impacts

The NADP would be implemented to avoid impacts to cultural resources. Therefore, there would not be a possibility for the NADP to combine with the cumulative projects listed in Chapter 2 to create cumulative impacts on cultural resources.

C. Impacts and Mitigation Measures

This section summarizes significant impacts identified in Section B, and proposes mitigation measures for each identified impact.

Impact CUL-1: Construction activities could disturb lost or undiscovered subsurface archaeological resources on the site.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure CUL-1: In the event that human remains and/or cultural materials are found in the process of implementing the NADP, all project-related construction would cease within a 15 meter (50-foot) radius in order to proceed with the testing and mitigation measures required pursuant to Section 7050.5 of the Health and Safety Code and Section 5097.94 of the Public Resources Code of the State of California. The State Historic Preservation Officer and the NASA Federal Preservation Officer would be contacted as soon as possible. Construction in the affected area

would not resume until the regulations of the Advisory Council on Historic Preservation (36 CFR Part 800) have been satisfied.

In the event of the discovery of human remains, the Santa Clara County Coroner would be notified by the project manager. The Coroner would make the determination as to whether the remains are Native American. If the Coroner determines that the remains are not subject to his or her authority, s/he would notify the Native American Heritage Commission, who would attempt to identify the descendants of the deceased Native American. If no satisfactory agreement can be reached as to the disposition of the remains pursuant to State law, then the remains would be reinterred with items associated with the Native American burial on the property in a location not subject to further disturbance.

Impact CUL-2: Rehabilitating existing historic structures could significantly impact their integrity.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure CUL-2a: Any project that involves the rehabilitation of contributing buildings within the Shenandoah Plaza Historic District would follow the Historic Resource Protection Plan. Appropriate landscaping would be used to avoid impact to historic buildings. The Historic Resources Protection Plan includes the guidelines for Rehabilitation of Historic structures prepared for NASA by Architectural Resources Group, and the Reuse Guideline for Hangar 1, prepared by Page and Turnbull, which comply with the Secretary of the Interior's Standards. New additions would be located on secondary facades. Restoring facades that have been previously altered would be considered as an alternative.

Mitigation Measure CUL-2b: The State Historical Building Code would be used when planning for structural stability or the installation of protective or code required mechanical systems or access.

Mitigation Measure CUL-2c: Design guidelines for the historic structures would be modified to include:

- Replacement glass would be with like kind.
- No change of exterior material would occur.
- Installation of utilities would not affect historic character defining features.
- New materials would not affect the historic integrity of original materials.
- Ground disturbing activities would match materials in-kind.

Impact CUL-3: Infill development within the Shenandoah Plaza Historic District could threaten the District's visual integrity.

Applicable to: Alternatives 2 through 5, and Mitigated Alternative 5

Mitigation Measure CUL-3a: Any new building or addition to an existing building constructed within the portion of the Shenandoah Plaza Historic District that lies within Ames Research Center would follow the Historic Resources Protection Plan, which includes the Design Guidelines for New Construction in the Shenandoah Plaza Historic District prepared for NASA by Architectural Resources Group (ARG). These guidelines set parameters for compatible designs including orientation, height, setback, materials and style. The guidelines also indicate which areas must not be used as building sites.

Mitigation Measure CUL-3b: Any project undertaken within the vicinity of designated or potentially-designated resources, structures or districts would be subject to review by the State Historic Preservation Officer through the Section 106 process of the National Historic Preservation Act. Any agreed upon mitigation, such as plan modification and design harmony, would be undertaken.

4.14 SOCIO-ECONOMIC CONDITIONS

This section identifies potential impacts on the population, housing, and economic development of Ames Research Center and its surrounding areas from each of the five alternatives. This section also proposes mitigation measures to reduce or eliminate identified impacts.

A. Standards of Significance

An alternative for the NASA Ames Development Plan (NADP) would have a significant impact with regard on the socio-economic conditions within Ames Research Center and the areas adjacent to it if it would:

- Create a significant detriment to the local economy.
- Create a significant negative impact on property values in areas adjacent to Ames Research Center.
- Create a cost impact on a local government or school district that amounts to more than 0.5 percent of that jurisdiction's General Fund or Revenue Limit.
- Generate workers who would not be able to find on-site housing representing over one percent of the predicted new households in the identified Housing Impact Area between 2000 and 2015. This would be considered significant due to the presence of a jobs-housing imbalance in the region.
- Contribute to the regional jobs-housing imbalance.
- Create a net negative fiscal impact on surrounding jurisdictions.
- Disproportionately impact minority populations or low income populations.

B. Housing Impacts

1. Employment

The housing impacts analysis begins with an estimation of the number of employees generated by each NADP alternative. The first stage in employment estimation is to determine the total space assigned to the eight major land uses at ARC, as described in Chapter 2. Table 2-12 contains these data, as well as a summary of NRP population, housing, and employment projections. After allocating space to each land use, employment projection factors for each category are developed, as shown in Table 2-3. With two exceptions, the number of square feet per employee is used as the projection factor. The employment factors are applied to their corresponding land use category to project the number of employees by land use.

The major land uses and their corresponding employment projection factors are described in detail in Chapter 2. This analysis assumes 100 percent occupancy for each of the land use categories. Full occupancy represents a conservative approach to estimating impacts. However, as market conditions shift, vacancy rates will vary, changing the number of employees at ARC and most likely resulting in marginally lower impact levels than predicted here.

2. Housing Supply and Residential Population

The next step in calculating NADP's housing impact is to determine the ARC housing supply and the number of ARC residents. These calculations are described in Chapter 2.

3. Project Impacts

The Project Impact is defined as the additional housing demand in the Housing Impact Area (HIA) generated by each NADP alternative. To estimate each alternative's Project Impact, the housing demand and supply generated by the NADP are projected using data from Sections 1 and 2.

To calculate project demand, the number of employees generated by NADP is translated into households by dividing the total employees by the number of

employed residents per household in the Bay Area in 2015 (the NADP buildout year), as projected by ABAG. This process results in the household demand generated by NADP. Household demand for each alternative is shown in Table 4.14-1.

To compare demand and supply, the number of proposed townhome and apartment units in each alternative is subtracted from the household demand, resulting in the number of households that would need to find housing outside of ARC and in the HIA. This additional household demand in the HIA represents the project impact of the NADP at buildout in 2013. It is expressed as a percentage of new households in the HIA between 2000 and 2015, as projected by ABAG. Any additional household demand is considered a negative impact because it aggravates the housing shortage projected over the next 15 years by ABAG and MTC and described in Chapter 3.14.

ABAG projections use the amount of developable land to estimate local employment and housing. ABAG staff report that ARC was not included in its database of developable land in the process of writing Projections 2000. Therefore, any employment generated at ARC is assumed to be in excess ABAG projections.

This methodology uses NADP employment as a base for determining regional housing demand, and excludes students from the analysis. A reasonable estimation of student demand for housing in the HIA is not feasible at this point due to the lack of information on the NADP university partners' educational program. The NADP university partners have expressed their intention to provide programs for approximately 3,000 undergraduate, graduate, continuing education, and extension students. However, they have not determined the specific mix of students. This analysis assumes that continuing education and extension students already reside in the HIA and will not add to the regional demand for housing. Undergraduate and graduate students, however, may relocate to the HIA to attend classes at ARC. This population will therefore add to the housing demand in the HIA, to the extent that their numbers exceed the number of student apartment and dormitories on

site. As the NADP university partners further refine their facility and educational programming plans, a more detailed analysis of housing demand generated by the student population can be conducted. This analysis may be included at the project-level environmental review process to be conducted by the university partners.

a. Alternative 1

Alternative 1 would generate no additional housing impact. The Comprehensive Use Plan Environmental Assessment describes the number of employees under this Alternative.

b. Alternative 2

As shown in Chapter 2, Alternative 2 would generate 13,068 employees. This number of employees would generate demand for approximately 7,182 new households in the Housing Impact Area (Table 4.14-1). This demand represents 5.74 percent of additional households in the Housing Impact Area between 2000 and 2015. Alternative 2 therefore creates a significant project impact in the Housing Impact Area.

c. Alternative 3

As shown in Chapter 2, Alternative 3 would generate 11,047 employees. This number of employees would generate demand for approximately 6,236 new households in the Housing Impact Area (Table 4.14-1). This demand represents 4.98 percent of additional households in the Housing Impact Area between 2000 and 2015. Alternative 3 therefore creates a significant project impact in the Housing Impact Area.

d. Alternative 4

As shown in Chapter 2, Alternative 4 would generate 15,599 employees. This number of employees would generate demand for approximately 8,460 new households in the Housing Impact Area (Table 4.14-1). This demand represents 6.76 percent of additional households in the Housing Impact Area between 2000 and 2015. Alternative 4 therefore creates a significant project impact in the Housing Impact Area.

Table 4.14-1: NASA Research Park Housing Impact - Project Analysis

Alternative	New Employees (a)	New Household Demand (b)	Proposed Townhome/Apt. Units (c)	Additional Household Demand in HIA (d)	% of Total New Households in HIA 2000 - 2015 (e)
Alternative Two	13,068	7,732	550	7,182	5.74%
Alternative Three	11,047	6,536	300	6,236	4.98%
Alternative Four	15,599	9,230	770	8,460	6.76%
Alternative Five	7,222	4,273	750	3,523	2.81%
Mitigated Alternative Five (f)	7,088	4,194	1,120	3,074	2.45%

Notes:
(a) From Table 2-13.
(b) New Household Demand equals New Employees divided by Employed Residents per Household for the Bay Area in 2015: 1.69
(c) From Tables 2-6 to 2-15.
(d) Additional Household Demand in HIA equals New Household Demand less Townhouse/Apartment Units.
HIA = Housing Impact Area, as defined by Table 3.14-8: Definition of Housing Impact Area.
(e) Total New Households in HIA = 125,232 From Table 3.14-10: Housing Impact Area Characteristics.
(f) Impacts resulting from application of Mitigation SOCIO 1-B. See Chapter Five for additional detail on this alternative.

Sources: NASA Research Park Planning Team; Metropolitan Transportation Commission, *Superdistrict and County Summaries of ABAG Projections, 2000* ; Association of Bay Area Governments, *Projections 2000* ; Bay Area Economics, 2002.

e. Alternative 5

As shown in Chapter 2, Alternative 5 would generate 7,222 employees. This number of employees would generate demand for approximately 3,523 new households in the Housing Impact Area (Table 4.14-1). This demand represents 2.81 percent of additional households in the Housing Impact Area between 2000 and 2015. Alternative 5 therefore creates a significant project impact in the Housing Impact Area. This alternative generates the smallest housing project impact among Alternatives 2 through 5.

f. Mitigated Alternative 5

Alternative 5, with Mitigation Measure SOCIO-1b applied, would generate 7,088 employees. This number of employees would generate demand for approximately 3,074 new households in the Housing Impact Area (Table 4.14-1). Taking into account the additional units added under SOCIO-1b, this demand represents 2.45 percent of additional households in the Housing Impact Area between 2000 and 2015. Alternative 5 therefore creates a significant project impact in the Housing Impact Area. This alternative generates a smaller impact than the unmitigated Alternative 5.

4. Cumulative Impacts

In addition to the impacts on housing supply in the Housing Area that would be caused by the NADP alternatives, additional cumulative impacts would be caused by other employment-generating projects in the region. Chapter 2 lists the projects in Sunnyvale and Mountain View that combine to create this impact.

To assess the cumulative impact of the NADP alternatives on regional housing supply, this analysis uses ABAG's projections of new households and housing units between 2000 and 2015. Cumulative demand is calculated by adding the households generated by the NADP to the households generated by baseline projects and the additional Bay Area households between 2000 and 2015. This figure is compared to the "unconstrained unit potential" as projected by ABAG between 2000 and 2015. The cumulative impact analysis is contained in Table

Table 4.14-2: NASA Research Park Housing Impact - Cumulative Analysis

Alternative	Additional Household Demand in HIA (a)	Cumulative Household Demand (b)	Unconstrained Unit Potential (c)	Jobs-Housing Balance (d)
Alternative Two	7,182	324,169	308,800	(15,369)
Alternative Three	6,236	323,224	308,800	(14,424)
Alternative Four	8,460	325,447	308,800	(16,647)
Alternative Five	3,523	320,510	308,800	(11,710)
Mitigated Alternative Five (e)	3,074	320,061	308,800	(11,261)

Notes:
(a) From Table 4.14-1.
(b) Cumulative Household Demand is sum of ABAG's projected additional Bay Area households between 2000 and 2015, Additional Household Demand from NADP, and households generated by Lab Project Employment as stated in the memo dated 9/12/00 from DC&E to NAS
(c) Unconstrained Unit Potential is the number of units calculated by ABAG that may be built in the Bay Area between 2000 and 2015 based on available land supply and local land use policies.
(d) Jobs-Housing Balance is difference between Unconstrained Unit Potential and Cumulative Household Demand. Note that this figure represents the *cumulative* jobs-housing imbalance, including all projected regional growth through 2015, not just growth due
(e) Impacts resulting from application of Mitigation SOCIO 1-B. See Chapter Five for additional detail on this alternative.

Sources: DC&E; Association of Bay Area Governments, *Projections 2000; Metropolitan Transportation Commission, Commuter Forecasts for the San francisco Bay Area: 1990-2020;* Bay Area Economics, 2002.

4.14-2. In this analysis, any increase in unmet housing demand is considered to be a significant impact because it would exacerbate the projected housing shortage described in Chapter 3.14.

a. Alternative 2

As shown in Table 4.14-2, Alternative 2 is part of a cumulative household demand for 324,169 Bay Area units between 2000 and 2015. As ABAG only projects a supply of 308,800 units over the next twenty years, a lack of 15,369 units is projected. This cumulative jobs-housing imbalance would represent a significant impact.

b. Alternative 3

As shown in Table 4.14-2, Alternative 3 is part of a cumulative household demand for 323,224 Bay Area units between 2000 and 2015. As ABAG only projects a supply of 308,800 units over the next twenty years, a lack of 14,424 units is projected. This cumulative jobs-housing imbalance would represent a significant impact.

c. Alternative 4

As shown in Table 4.14-2, Alternative 4 is part of a cumulative household demand for 325,447 Bay Area units between 2000 and 2015. As ABAG only projects a supply of 308,800 units over the next twenty years, a lack of 16,647 units is projected. This cumulative jobs-housing imbalance would represent a significant impact.

d. Alternative 5

As shown in Table 4.14-2, Alternative 5 is part of a cumulative household demand for 320,510 Bay Area units between 2000 and 2015. As ABAG only projects a supply of 308,800 units over the next twenty years, a lack of 11,710 units is projected. This cumulative jobs-housing imbalance would represent a significant impact. However, it is the smallest impact among Alternatives 2 through 5.

e. Mitigated Alternative 5

As shown in Table 4.14-2, the mitigated Alternative 5 is part of a cumulative household demand for 320,061 Bay Area units between 2000 and 2015. As ABAG only projects a supply of 308,800 units over the next twenty years, a lack of 11,261 units is projected. This cumulative jobs-housing imbalance would represent a significant impact. However, it is a smaller impact than the unmitigated Alternative 5.

C. Fiscal Impacts

This section outlines the methodology of calculating the increased costs and revenues to the City of Mountain View, Santa Clara County, the Mountain View School District, and the Mountain View-Los Altos Union High School District.

The City of Sunnyvale would not incur any significant fiscal impacts because no significant new development would occur on the portions of ARC within the Sunnyvale city limits. The only impacts would be in regard to sewage treatment, which is addressed separately in this section.

This section also contains estimates of fiscal impacts to each of the jurisdictions associated with Alternatives 2 through 5. The fiscal impacts are summarized in Table 4.14-3.

Alternative 1, the "no action" alternative, has no fiscal impact on the surrounding jurisdictions, and is therefore excluded from this analysis.

1. City of Mountain View

This section documents the fiscal impacts on the City of Mountain View.

Table 4.14-3: Annual Fiscal Impacts Summary

	Alternative Two	Alternative Three	Alternative Four	Alternative Five	Mitigated Alternative Five (a)
INCREASED REVENUES					
City of Mountain View					
Sales and Use Tax	$342,481	$84,452	$641,436	$146,994	$321,383
Utility Users Tax	$55,782	$0	$157,864	$76,111	$113,659
Construction Tax (b)	$98,750	$0	$204,450	$56,250	$87,840
Gas Tax	$4,408	$0	$9,697	$13,224	$19,747
Motor Vehicle In-Lieu Fees	$35,932	$0	$79,050	$107,795	$160,974
Total	**$438,603**	**$84,452**	**$888,047**	**$344,123**	**$615,762**
Santa Clara County					
Sales and Use Tax	$289,864	$398,737	$240,847	$274,026	$274,026
Motor Vehicle In-Lieu Fees	$152,997	$96,366	$196,391	$213,832	$371,889
Transient Occupancy Tax	$317,633	$397,041	$293,811	$397,041	$397,041
Total	**$760,494**	**$892,145**	**$731,049**	**$884,900**	**$1,042,957**
Mountain View-Whisman School District					
Developer Impact Fees (b)	$541,000	$0	$1,169,400	$1,233,000	$1,702,910
Federal Impact Aid	$42,747	$23,316	$59,910	$58,291	$87,048
Revenue Limit Funds	$347,165	$189,362	$486,556	$473,406	$706,953
Total	**$389,911**	**$212,679**	**$546,467**	**$531,697**	**$794,002**
Mountain View-Los Altos Union High School District					
Developer Impact Fees (b)	$304,000	$0	$652,800	$622,000	$845,240
Federal Impact Aid	$3,252	$1,774	$4,557	$4,434	$6,622
State Basic Aid	$2,376	$1,296	$3,330	$3,240	$4,838
Total	**$5,628**	**$3,070**	**$7,887**	**$7,674**	**$11,460**
Subtotal - Revenues	**$1,594,636**	**$1,192,346**	**$2,173,450**	**$1,768,394**	**$2,464,181**
INCREASED EXPENDITURES					
City of Mountain View					
Recreational Program Costs	$176,973	$111,468	$227,168	$247,341	$430,168
Santa Clara County	$0	$0	$0	$0	$0
Mountain View-Whisman School District	$395,054	$215,484	$553,674	$538,710	$804,473
Mountain View-Los Altos Union High School District	$163,368	$89,110	$228,963	$222,775	$332,677
Subtotal - Net Expenditures	**$735,395**	**$416,062**	**$1,009,805**	**$1,008,826**	**$1,567,319**
NET FISCAL (DEFICIT)/SURPLUS					
City of Mountain View	**$261,630**	**($27,016)**	**$660,879**	**$96,781**	**$185,594**
Santa Clara County	**$760,494**	**$892,145**	**$731,049**	**$884,900**	**$1,042,957**
Mountain View -Whisman School District (b)	**($5,142)**	**($2,805)**	**($7,207)**	**($7,012)**	**($10,471)**
Mountain View-Los Altos Union High School District (c)	**($157,741)**	**($86,040)**	**($221,076)**	**($215,101)**	**($321,217)**
Total Fiscal (Deficit)/Surplus	**$859,241**	**$776,284**	**$1,163,645**	**$759,568**	**$896,862**

Notes:
(a) Impacts resulting from application of Mitigation SOCIO 1-B. See Chapter Five for additional detail on this alternative.
(b) One-time revenue excluded from all totals.

Source: Bay Area Economics, 2002.

a. Revenues

The development of NRP would generate revenues for the City of Mountain View primarily through sales and use tax, utility users tax, construction tax, gas tax, and motor vehicle in-lieu fees.

The City of Mountain View also receives revenue from property taxes, a real property conveyance tax, a local business license tax, and a transient occupancy tax. However, these taxes will not likely apply to ARC. Although personal property taxes may be levied on private property in areas under proprietary interest, such as the portions of ARC within the City of Mountain View limits, NASA intends to have a not-for-profit entity, such as a non-profit developer, the University of California, Carnegie Mellon University (a private non-profit institution), or San Jose State University (the NRP partner universities), develop the site. Not-for-profit entities would be exempt from property tax. Property and possessory interest taxes may apply to these non-profit parties should they enter into leasehold agreements with for-profit entities on a portion of the site. To be conservative, however, it is assumed that these taxes would not apply to development under the NADP.

Real property conveyance taxes do not apply because no transfer of property would be taking place at ARC; NRP partners and tenants would operate on ground leases and sublease agreements. The remaining taxes do not apply because no businesses or transient lodging uses would be developed on the portion of ARC under proprietary jurisdiction of and within the City of Mountain View's limits. The revenue impact is calculated based on the sales, population, and development occurring in the Bay View area. This is the only portion of the ARC that lies within Mountain View's city limits.

The following sections describe the assumptions underlying the revenue projections for each of the relevant revenue sources.

i. Sales and Use Taxes

Sales and use tax is collected and distributed by the State Board of Equalization. The current sales tax rate in Santa Clara County is 8.25 percent. The

jurisdictions receiving a share of the sales and use tax levy include the State of California (6 percent), the County Transit District (0.5 percent), the City of Mountain View General Fund (1 percent), and Santa Clara County through Measure B and County funds (0.75 percent).

The City of Mountain View's share of taxable sales includes retail sales occurring off ARC, in Mountain View, and taxable sales occurring in Bay View. The City would not gain revenue from taxable sales occurring in the unincorporated portions of ARC.

The sales taxes in this analysis are generated from resident, employee, and business-to-business expenditures. Resident expenditures are estimated by applying the 1999 (latest year available) per capita taxable sales expenditures for the City of Mountain View to the number of NRP residents. Employee expenditures are estimated by assuming $7.50 in daily expenditures per employee, and 240 work days a year. These figures are compared to the potential taxable sales of on-site retail outlets. Potential on-site retail sales are estimated using the median sales per gross square foot for neighborhood shopping centers in the Western United States. Projected resident and employee sales in excess of the on-site sales potential are assumed to take place in the City of Mountain View.

Business-to-business taxable sales are estimated using a factor developed from the annual taxable sales per square foot for office/R&D firms in the Moffett Park area of Sunnyvale. Moffett Park contains a number of high technology/R&D firms which serve as comparables for NRP partner firms. The taxable sales per square foot is multiplied by the square footage dedicated to office/R&D uses at NRP to project taxable sales generated by NRP partners.

Sales tax estimates for the City of Mountain View are contained in Table 4.14-4.

Alternative 2 is projected to generate approximately $342,481 in annual sales and use tax revenue for the City of Mountain View.

Table 4.14-4: Sales Tax Revenue Estimates

Estimated Resident-Generated Local Taxable Sales	
1999 Mountain View Taxable Retail Sales	$863,201,000
Current Mountain View population	76,400
1999-2000 Estimated Per Capita Mountain View Resident Taxable Expenditures	$11,298
Less estimated resident taxable transactions outside Mountain View: 25%	$2,825
Estimated Annual Local Per Capita Expenditures (1999-00)	**$8,474**
Estimated Employee-Generated Local Taxable Sales	
Estimated Work Days Per Employee/Year	240
Estimated Average Daily Expenditures	$7.50
Estimated Annual Per-Employee Expenditures (1999-00)	**$1,800**
Estimated On-Site Taxable Retail Sales	
Estimated Taxable Retail Sales Per Square Foot of Retail Space	**$296.23**
Estimated On-Site Taxable Business-to-Business Sales	
Estimated Taxable Business-to-Business Sales Per Square Foot of Office/R&D/Industrial Space (a)	**$13.48**

ESTIMATED IMPACTS (b)	**Alternative Two**	**Alternative Three**	**Alternative Four**	**Alternative Five**	**Mitigated Alternative Five (j)**
Resident Expenditures	$17,112,903	$10,778,714	$21,966,644	$23,917,390	$41,596,346
Employee Expenditures	$23,521,743	$19,883,753	$28,078,760	$12,999,212	$12,759,212
Retail Taxable Sales	$14,811,500	$22,217,250	$10,368,050	$22,217,250	$22,217,250
Business-to-Business Taxable Sales (c)	$32,261,994	$30,947,694	$46,211,098	$14,319,602	$14,319,602
On-site taxable sales (d)	$47,073,494	$53,164,944	$56,579,148	$36,536,852	$36,536,852
On-site taxable sales in Mountain View city limits (e)	$8,425,000	$0	$24,466,200	$0	$0
On-site taxable sales in unincorporated areas (f)	$38,648,494	$53,164,944	$32,112,948	$36,536,852	$36,536,852
Off-site taxable sales in Mountain View (g)	$25,823,146	$8,445,217	$39,677,353	$14,699,352	$32,138,308
City of Mountain View Percentage of Sales Tax Revenue (h)	**$342,481**	**$84,452**	**$641,436**	**$146,994**	**$321,383**
Santa Clara County Percentage of Sales Tax Revenue (i)	**$289,864**	**$398,737**	**$240,847**	**$274,026**	**$274,026**

Notes:
(a) Figure is the taxable sales per square foot for Office/R&D uses in Sunnyvale's Moffett Park in 2000.
(b) Annual sales tax revenue calculated at buildout.
(c) Assumes 25 percent of University office space will generate sales tax.
(d) Includes Retail Taxable Sales and Business-to-Business Taxable Sales.
(e) Includes Business-to-Business Taxable Sales occurring in the Bay View.
(f) The difference between (d) and (e).
(g) Includes the sum of Employee Expenditures and Resident Expenditures, less on-site Retail Taxable Sales.
(h) Includes 1% of on-site taxable sales in Mountain View city limits and 1% of off site taxable sales.
(i) Includes .75% of on-site taxable sales in unincorporated areas. Insignificant resident and employee expenditures are expected to occur in unincorporated areas outside of NRP.
(j) Impacts resul ing from application of Mi igation SOCIO 1-B. See Chapter Five for addi ional detail on this alternative.

Sources: California State Board of Equalization; Lloyd DeLLamas, HdL; *Dollars and Cents of Shopping Centers: 2000*; Bay Area Economics, 2002.

Alternative 3 is projected to generate approximately $84,452 in annual sales and use tax revenue.

Alternative 4 is projected to generate approximately $631,436 in annual sales and use tax revenue.

Alternative 5 is projected to generate approximately $146,994 in annual sales and use tax revenue.

Mitigated Alternative 5, with the application of measure SOCIO-1b, is projected to approximately $321,383 in annual sales and use tax revenue.

ii. Utility Users Tax

The City of Mountain View levies a 3 percent tax on the sale of utilities. This tax would apply to residential and commercial uses in the portion of Bay View within the city limits of Mountain View. The utility users tax revenue generated by NRP is projected by applying Mountain View's current per capita utility users tax revenue to the projected NRP service population. The current per capita revenue is the City's current utility users tax revenue divided by the existing service population. The existing service population includes the City's residential population, plus 50 percent of total employment. This methodology is a common standard for estimating the service population, given that employees typically consume utilities at approximately half the rate of residents. Note that this methodology only generates a preliminary estimate of utility users tax revenue, as the commercial utility consumption will vary with industry and use. Utility users tax estimates are contained in Table 4.14-5.

Alternative 2 is projected to generate approximately $55,782 in annual utility users tax revenue for the City of Mountain View.

Alternative 3 is not projected to generate any additional utility users tax revenue.

Table 4.14-5: Utility Users Tax Revenue

Current Mountain View Utility Users Tax Revenues

Current Mountain View Revenues (1999-2000)	$3,901,073
Current Population	76,400
50 Percent of Current Employment	38,540
Total Service Population	114,940
Current Per Capita Revenues	$33.94

ESTIMATED IMPACTS (a)	**Alternative Two**	**Alternative Three**	**Alternative Four**	**Alternative Five**	**Mitigated Alternative Five (b)**
Service Population (b)	1,644	0	4,651	2,243	3,349
TOTAL ANNUAL INCREASED REVENUES TO CITY	**$55,782**	**$0**	**$157,864**	**$76,111**	**$113,659**

Notes:
(a) Annual utility users tax revenue calculated at buildout.
(b) Impacts resulting from application of Mitigation SOCIO 1-B. See Chapter Five for additional detail on this alternative.
(c) Includes Bay View resident population plus one half of Bay View employee population.

Sources: City of Mountain View Finance Department; Association of Bay Area Governments, *Projections, 2000* ; Bay Area Economics, 2002.

Alternative 4 is projected to generate approximately $157,864 in annual utility users tax revenue.

Alternative 5 is projected to generate approximately $76,111 in annual utility users tax revenue.

Mitigated Alternative 5, with the application of measure SOCIO-1b, is projected to generate approximately $113,659 in annual utility users tax revenue.

iii. Construction Tax

The City of Mountain View levies a construction tax on new construction within the city limits. The tax is $0.08 per square foot on commercial developments, and $75 per unit for residential developments containing at least twenty or more units. This analysis calculates the construction tax assessed on development in Bay View. Construction tax estimates are contained in Table 4.14-6.

Alternative 2 is projected to generate approximately $98,750 in construction tax revenue for the City of Mountain View.

Alternative 3 is not projected to generate any additional construction tax revenue.

Alternative 4 is projected to generate approximately $204,450 in construction tax revenue.

Alternative 5 is projected to generate approximately $56,250 in construction tax revenue.

Mitigated Alternative 5, with the application of measure SOCIO-1b, is projected to generate approximately $87,840 in construction tax revenue.

Table 4.14-6: Construction Tax Revenue Estimates

CONSTRUCTION TAX RATE

For Residential Developments	$75	per unit
For Non-Residential Uses	$0.08	per sqft

APPLICABLE SPACE (a)	**Alternative Two**	**Alternative Three**	**Alternative Four**	**Alternative Five**
Residential Units	250	0	550	1,120
Non-Residential Space (sqft)	1,000,000	0	2,040,000	48,000

ESTIMATED TAXES GENERATED (b)	**Alternative Two**	**Alternative Three**	**Alternative Four**	**Alternative Five**
Residential Construction Tax	$18,750	$0	$41,250	$84,000
Non-Residential Construction Tax	$80,000	$0	$163,200	$3,840
Total Estimated Construction Tax (b)	**$98,750**	**$0**	**$204,450**	**$87,840**

Notes:
(a) Includes residential and non-residential uses in the Bay View area of NRP, located in the City of Mountain View.
(b) Construction tax revenue calculated at buildout.

Sources: City of Mountain View Finance Department; Bay Area Economics, 2001.

iv. Gas Tax

The City of Mountain View maintains a Gas Tax Fund, which is required by state law to account for gas taxes collected and allocated by the State. These taxes are levied on gasoline and other motor fuels in terms of cents per gallon, and then distributed to the State, cities, and counties on a formula based on population. Gas Tax funds are spent on maintenance and capital related to public streets and highways.

This analysis estimates the increased Gas Tax Revenue by determining the City of Mountain View's current per capita gas tax allocations, and multiplying this factor by the projected resident population of Bay View. Gas tax estimates are contained in Table 4.14-7.

Alternative 2 is projected to generate approximately $4,408 in annual gas tax revenue for the City of Mountain View.

Alternative 3 is not projected to generate any additional gas tax revenue.

Alternative 4 is projected to generate approximately $9,697 in annual gas tax revenue.

Alternative 5 is projected to generate approximately $13,224 in annual gas tax revenue.

Mitigated Alternative 5, with the application of measure SOCIO-1b, is projected to generate approximately $19,747 in annual gas tax revenue.

v. Motor Vehicle In-Lieu Fees

Instead of imposing a property tax on motor vehicles, the State imposes an "in-lieu" fee on vehicle registrations. The in-lieu fee is equal to two percent of the vehicle value. The State collects these fees with annual vehicle registration fees, and allocates a portion back to local governments based on the size of the local resident population. To estimate future revenues, this analysis applies Mountain View's current per-capita Motor Vehicle In-Lieu Fee revenue to the

Table 4.14-7: Gas Tax Revenue Estimates

Current Gas Tax Revenues	
Current Revenues (1999-2000)	$450,515
Current Population of Mountain View	76,400
Current Per Capita Revenues	$5.90

ESTIMATED IMPACTS (a)	Alternative Two	Alternative Three	Alternative Four	Alternative Five	Mitigated Alternative Five (b)
New Residents (c)	748	0	1,645	2,243	3,349
TOTAL INCREASED REVENUES	**$4,408**	**$0**	**$9,697**	**$13,224**	**$19,747**

Notes:
(a) Annual gas tax revenue calculated at buildout.
(b) Impacts resulting from application of Mitigation SOCIO 1-B. See Chapter Five for additional detail on this alternative.
(c) Includes Bay View residents.

Sources: City of Mountain View Fiscal Year 2000-2001 Proposed Budget; Association of Bay Area Governments, *Projections 2000* ; Bay Area Economics, 2002.

projected resident population of Bay View. Estimates of motor vehicle in-lieu fees are contained in Table 4.14-8.

Alternative 2 is projected to generate approximately $35,932 in annual Motor Vehicle In-Lieu Fees for the City of Mountain View.

Alternative 3 is not projected to generate any additional Motor Vehicle In-Lieu Fees.

Alternative 4 is projected to generate approximately $79,050 in annual Motor Vehicle In-Lieu Fees.

Alternative 5 is projected to generate approximately $107,795 in annual Motor Vehicle In-Lieu Fees.

Mitigated Alternative 5, with the application of measure SOCIO-1b, is projected to generate approximately $160,974 in annual Motor Vehicle In-Lieu Fees.

b. Costs

This section contains information regarding the cost impacts of development under the NADP on the City of Mountain View to provide basic services required by the NADP. Services covered in this section include police, fire, water, sewer, storm water, and recreational facilities.

i. Police

The proposed project is not expected to create significant fiscal impacts for the City of Mountain View with regard to police protection requirements. Currently, NASA is responsible for police protection and security at ARC facilities, which it contracts out to a private company. NASA intends to maintain this system in the future. Implementation of the NADP would not require regular patrols by the City of Mountain View Police Department or by other jurisdictions' police departments.

Table 4.14-8: Motor Vehicle In-Lieu Fees Revenue Estimate

Current Motor Vehicle In-Lieu Fee Revenues	
City of Mountain View	
Current Mountain View Revenues (1999-2000)	$3,672,475
Current Population	76,400
Current Per Capita Revenues	$48.07
Santa Clara County	
Current Santa Clara County Revenues (FY 2000)	$132,981,000
Current Population	1,755,300
Current Per Capita Revenues	$75.76

ESTIMATED IMPACTS (a)	**Alternative Two**	**Alternative Three**	**Alternative Four**	**Alternative Five**	**Mitigated Alternative Five (b)**
New Mountain View Residents (c)	748	-	1,645	2,243	3,349
New Santa Clara County Residents	2,020	1,272	2,592	2,823	4,909
TOTAL INCREASED REVENUES TO MOUNTAIN VIEW	**$35,932**	**$0**	**$79,050**	**$107,795**	**$160,974**
TOTAL INCREASED REVENUES TO SANTA CLARA CO.	**$152,997**	**$96,366**	**$196,391**	**$213,832**	**$371,889**

Notes:
(a) Annual motor vehicle license fees revenue calculated at buildout.
(b) Impacts resulting from application of Mitigation SOCIO 1-B. See Chapter Five for additional detail on this alternative.
(c) Includes Bay View residents.

Sources: Santa Clara County, Fiscal Year 2001 Recommended Budget; Association of Bay Area Governments, *Projections 2000*; City of Mountain View Finance Department; Bay Area Economics, 2002.

ii. Fire

The proposed project is not expected to create significant fiscal impacts for the City of Mountain View with regard to fire protection requirements. Fire protection services at ARC facilities are currently provided by the California Air National Guard (CANG). The department's personnel and equipment are located on-site at the ARC. NASA intends to maintain this fire protection system in the future, and ARC would not require fire protection services from the City of Mountain View or other local jurisdictions. NASA's fire protection service also provides emergency medical services. ARC is part of the Santa Clara County Fire Mutual Aid service, and thus has a cooperative response agreement with all of the city fire departments in Santa Clara County. This agreement is described in Section 3.6. Due to the mutually beneficial nature of this agreement the costs are assumed to be negligible.

iii. Water

The infrastructure impact analysis (Section 4.5) identifies few improvements needed to off-site water infrastructure. NASA will fund all improvements needed to supply the NADP development, mitigating any capital expense impacts to the City of Mountain View. Water service providers set their rate structure to assure that services are fully paid for by users. Therefore, no on-going net fiscal impact is anticipated.

iv. Sewer

Per mitigation measure INFRA-2, NASA and its partners would mitigate their fair share of the capital expense impacts to the Mountain View sewer conveyance and treatment system. On an on-going basis, sewer service providers set their rate structure to assure that services are fully paid for by users. Therefore, no on-going net fiscal impact is anticipated.

v. Stormwater

NASA and its partners will fully bear the capital expense of upgrading the on-site drainage system. No net fiscal impact is anticipated.

vi. Recreational and Library Facilities

The City of Mountain View may incur costs from ARC residents that use the City's recreational facilities and programs, as well as its libraries. This analysis estimates ARC's cost impact on the City's recreational and library services by applying the City of Mountain View's current per capita recreational program expenditures to the projected ARC resident population under each alternative. This analysis is contained in Table 4.14-9.

Alternative 2 is projected to generate approximately $176,973 in annual Recreational Program costs to the City of Mountain View.

Alternative 3 is projected to generate approximately $111,468 in annual Recreational Program costs.

Alternative 4 is projected to generate approximately $227,168 in annual Recreational Program costs.

Alternative 5 is projected to generate approximately $247,341 in annual Recreational Program costs.

Mitigated Alternative 5, with the application of measure SOCIO-1b, is projected to generate approximately $430,168 in annual Recreational Program costs.

c. Conclusions

As shown in Table 4.14-3, Alternative 2 is projected to generate an annual revenue impact of approximately $438,603 and an annual cost impact of approximately $176,973 creating a net fiscal surplus of $261,630. No adverse impact would occur.

As shown in Table 4.14-3, Alternative 3 is projected to generate an annual revenue impact of approximately $84,452 and an annual cost impact of approximately $111,468, creating a net fiscal deficit of $27,016. This deficit would represent a significant impact.

Table 4.14-9: Recreational Program Fiscal Impacts

Current Recreational Program Costs	
2000-2001 City of Mountain View Recreation and LIbrary Expenditures	$6,695,089
Current Population	76,400
Current Per Capita Expenditures	$87.63

ESTIMATED IMPACTS (a)	**Alternative Two**	**Alternative Three**	**Alternative Four**	**Alternative Five**	**Mitigated Alternative Five (b)**
New Residents (c)	2,020	1,272	2,592	2,823	4,909
TOTAL INCREASED COSTS	**$176,973**	**$111,468**	**$227,168**	**$247,341**	**$430,168**

Notes:
(a) Annual impacts calculated at buildout.
(b) Impacts resulting from application of Mitigation SOCIO 1-B. See Chapter Five for additional detail on this alternative.
(c) Includes all NADP residents.

Sources: City of Mountain View Fiscal Year 2000-2001 Proposed Budget; Association of Bay Area Governments, *Projections 2000* ; Bay Area Economics, 2002.

As shown in Table 4.14-3, Alternative 4 is projected to generate an annual revenue impact of approximately $888,047 and an annual cost impact of approximately $227,168, creating a net fiscal surplus of $660,879. No adverse impact would occur.

As shown in Table 4.14-3, Alternative 5 is projected to generate an annual revenue impact of approximately $344,123 and an annual cost impact of approximately $247,341, creating a net fiscal surplus of $96,781. No adverse impact would occur.

As shown in Table 4.14-3, mitigated Alternative 5, with the application of measure SOCIO-1b, is projected to generate an annual revenue impact of approximately $615,762 and an annual cost impact of approximately $430,168 creating a net fiscal surplus of $185,594. No adverse impact would occur.

2. Santa Clara County

This section documents the fiscal impacts on Santa Clara County.

a. Revenues

i. Sales and Use Taxes

As discussed above, the County receives 0.75 of the 8.25 cent State sales tax. The County would receive sales and use tax on the retail and office space located in the unincorporated portion of ARC. Table 4.14-4 contains sales and use tax estimates for Santa Clara County.

Alternative 2 is projected to generate approximately $289,864 in annual sales and use tax revenue for Santa Clara County.

Alternative 3 is projected to generate approximately $398,737 in annual sales and use tax revenue.

Alternative 4 is projected to generate approximately $240,847 in annual sales and use tax revenue.

Alternative 5 is projected to generate approximately $274,026 in annual sales and use tax revenue.

Mitigated Alternative 5, with the application of measure SOCIO-1b, is projected to generate approximately $274,026 in annual sales and use tax revenue.

ii. Motor Vehicle In Lieu Fees

An analogous procedure was used to calculate the County's share of motor vehicle in-lieu fees as for the City of Mountain View. The County's current per capita Motor Vehicle In-Lieu Fee revenue is applied to the NRP residential population. Table 4.14-8 contains Motor Vehicle In-Lieu Fee projections for Santa Clara County.

Alternative 2 is projected to generate approximately $152,997 in annual Motor Vehicle In-Lieu Fees for Santa Clara County.

Alternative 3 is projected to generate approximately $96,366 in annual Motor Vehicle In-Lieu Fees.

Alternative 4 is projected to generate approximately $196,391 in annual Motor Vehicle In-Lieu Fees.

Alternative 5 is projected to generate approximately $213,832 in annual Motor Vehicle In-Lieu Fees.

Mitigated Alternative 5, with the application of measure SOCIO-1b, is projected to generate approximately $371,889 in annual Motor Vehicle In-Lieu Fees.

iii. Transient Occupancy Tax

The County levies an 8 percent transient occupancy tax (TOT) on lodging facilities in unincorporated areas. The proposed NRP conference center would be subject to this tax. TOT is calculated by determining the current per room

TOT revenue in Santa Clara County and applying this figure to the number of rooms at the NRP conference center. When calculating the current per room TOT revenue in the County, recreational vehicle parks were excluded due to their unusual occupancy rates and rate structure. Table 4.14-10 contains TOT estimates for Santa Clara County.

Alternative 2 is projected to generate approximately $317,633 in annual transient occupancy tax revenue for Santa Clara County.

Alternative 3 is projected to generate approximately $397,041 in annual transient occupancy tax revenue for Santa Clara County.

Alternative 4 is projected to generate approximately $293,811 in annual transient occupancy tax revenue.

Alternative 5 is projected to generate approximately $397,041 in annual transient occupancy tax revenue.

Mitigated Alternative 5, with the application of measure SOCIO-1b, is projected to generate approximately $397,041 in annual transient occupancy tax revenue.

b. Costs

As stated above, ARC maintains its own fire, EMS, and police services, and is not expected to create a fiscal impact on the County in terms of public safety. ARC does maintain mutual aid agreements with surrounding jurisdictions, but due to its mutually beneficial nature, its costs are considered to be negligible. No other cost impacts to the County are anticipated from any of the alternatives.

c. Conclusions

Alternative 2 is projected to generate an annual net revenue increase of $760,494 for Santa Clara County. No adverse impact would occur.

Table 4.14-10: Transient Occupancy Tax Revenue Estimates

Current Santa Clara County Transient Occupancy Tax Revenues

Current Revenues (FY 2000)	$268,400
Total Unincorporated Santa Clara County Lodging Rooms	169
Current Per Existing Hotel/Motel Room Transient Occupancy Tax Revenue	$1,588

ESTIMATED IMPACTS (a)	Alternative Two	Alternative Three	Alternative Four	Alternative Five	Mitigated Alternative Five (b)
New Rooms	200	250	185	250	250
TOTAL INCREASED REVENUES	**$317,633**	**$397,041**	**$293,811**	**$397,041**	**$397,041**

Notes:
(a) Annual transient occupancy tax revenue calculated at buildout.
(b) Impacts resulting from application of Mitigation SOCIO 1-B. No change is expected in mitiagetd Alternative Five. See Chapter Five for additional detail on this alternative.

Source: Santa Clara County, *Fiscal Year 2001 Recommended Budget* ; Santa Clara County Department of Revenue; Bay Area Economics, 2002.

Alternative 3 is projected to generate an annual net revenue increase of $892,145. No adverse impact would occur.

Alternative 4 is projected to generate an annual net revenue increase of $731,049. No adverse impact would occur.

Alternative 5 is projected to generate an annual net revenue increase of $884,900. No adverse impact would occur.

Mitigated Alternative 5, with the application of measure SOCIO-1b, is projected to generate an annual net revenue increase of $1,042,957. No adverse impact would occur.

3. Mountain View-Whisman School District

This section documents the fiscal impacts on the Mountain View-Whisman School District.

a. Revenues

Student forecasts used for this analysis are contained in Table 4.14-11. Projections were developed using student generation ratios from the *Mountain View Elementary School District Development Impact Fee Justification Study*.[1]

i. Revenues

Student forecasts used for this analysis are contained in Table 4.14-11. Projections were developed using student generation ratios from the *Mountain View Elementary School District Development Impact Fee Justification Study*.[2]

[1] Schoolhouse Services. *Mountain View Elementary School District Development Impact Fee Justification Study*, April 27, 1999.

[2] Schoolhouse Services. *Mountain View Elementary School District Development Impact Fee Justification Study*, April 27, 1999.

Table 4.14-11: NASA Research Park Student Generation Estimates

STUDENT GENERATION

School District	Student Generation Ratio (per unit) (a)	Alternative Two		Alternative Three		Alternative Four		Alternative Five		Mitigated Alternative Five (b)	
		Units	Students	Units	Students	Units	Students	Units	Students	Units	Students
Mtn View-Whisman District											
Grades K-3	0.066	550	36	300	20	771	51	750	50	1,120	74
Grades 4-5	0.029	550	16	300	9	771	22	750	22	1,120	32
Grades 6-8	0.037	550	20	300	11	771	29	750	28	1,120	41
Total Elementary			**73**		**40**		**102**		**99**		**148**
Mtn View-Los Altos High	0.036	550	**20**	300	**11**	771	**28**	750	**27**	1,120	**40**
Total Students			**92**		**50**		**130**		**126**		**188**

Notes:
a) Student Generation Estimates from Mountain View Elementary School District Development Impact Fee Justification Study, April 27, 1999.
(b) Impacts resulting from application of Mitigation SOCIO 1-B. See Chapter Five for additional detail on this alternative.

Sources: Schoolhouse Services; Bay Area Economics, 2002.

Developer Impact Fees

The Mountain View-Whisman School District receives a one-time impact fee of $1.37/square foot for residential developments and $0.13/square foot for office development in the District's boundaries. This fee schedule would be applied to the portion of the ARC within the School District's boundaries and outside of exclusive federal legislative area (i.e. the Bay View portion of the site) to create additional revenue to the district. Table 4.14-12 presents estimates of Developer Impact Fees.

Alternative 2 is projected to generate approximately $541,000 in Developer Impact Fees for the Mountain View-Whisman School District.

Alternative 3 is not projected to generate any additional Developer Impact Fees.[3]

Alternative 4 is projected to generate approximately $1.2 million in Developer Impact Fees.

Alternative 5 is projected to generate approximately $1.2 million in Developer Impact Fees.

Mitigated Alternative 5 is projected to generate approximately $1.7 million in Developer Impact Fees.

ii. Federal Impact Aid

The U.S. Department of Education provides funding to local school districts whose enrollment includes students who live on federal property or who live with a parent who is employed on federal property. These students must comprise at least 3 percent of the overall student body to make the district

[3] Alternative 3 would not generate any fees because it would not include development in the Bay View area, which is within school district boundaries. NRP lands are within an exclusive federal legislative area. No development on these lands would have to pay school impact fees.

eligible for Impact Aid. Impact Aid is intended to compensate the districts for the fact that the federal government does not contribute to the local property tax base.

A district's share of Impact Aid is calculated through a complex process that involves the number of eligible students in the district, the number of total students, and the percentage of the district's budget dedicated to eligible students. This Impact Aid figure varies significantly from year-to-year. Furthermore, the program is subject to Congressional appropriations and changes in the program guidelines. Given these factors, it is difficult to produce reliable forecasts of per-student Impact Aid payments in 2013 (NADP's buildout horizon). The Impact Aid projections in this analysis, therefore, are preliminary estimates.

Future Impact Aid payments are calculated by multiplying the Impact Aid payment per student to the Whisman School District in Fiscal Year 2001 by the number of elementary and middle school students generated by the NADP. The Mountain View District did not apply for Impact Aid funding in Fiscal Year 2001.[4] Table 4.14-12 presents estimates of Impact Aid generation at NADP buildout.

Alternative 2 is projected to generate approximately $42,747 in Federal Impact Aid for the Mountain View-Whisman School District.

Alternative 3 is projected to generate approximately $23,316 in Federal Impact Aid.

Alternative 4 is projected to generate approximately $59,910 in Federal Impact Aid.

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[4] Prior to the 2001-2002 school year, Whisman and Mountain View School Districts were distinct districts. They merged in the 2001-2002 school year due to declining enrollment and other factors.

Table 4.14-12: School District Impact Aid and Developer Fee Estimate

FEDERAL IMPACT AID	Per-student Payments
Mountain View-Whisman School District Federal Impact Aid (a)	$588.80
Mountain View-Los Altos Union High School District Federal Impact Aid (b)	$164.23

DEVELOPER FEES	Non-Residential	Residential
Mountain View-Whisman School District (c) Developer Fee ($/sqft)	$0.13	$1.37
Mountain View-Los Altos Union High School District Developer Fee ($/sqft)	$0.10	$0.68

ESTIMATED ANNUAL REVENUE (d)	Alternative Two	Alternative Three	Alternative Four	Alternative Five	Mitigated Alternative Five (g)
Mountain View-Whisman School District Federal Impact Aid (e)	$42,747	$23,316	$59,910	$58,291	$87,048
Mountain View-Los Altos Union High School Federal Impact Aid (e)	$3,252	$1,774	$4,557	$4,434	$6,622
Total Annual School Revenue	**$45,999**	**$25,090**	**$64,468**	**$62,725**	**$93,670**
ESTIMATED ONE-TIME REVENUE (d)					
Mountain View-Whisman School District Developer Fee (f)	$541,000	$0	$1,169,400	$1,233,000	$1,702,910
Mountain View-Los Altos Union High School District Developer Fee (f)	$304,000	$0	$652,800	$622,000	$845,240
Total One-Time School Revenue	**$845,000**	**$0**	**$1,822,200**	**$1,855,000**	**$2,548,150**

Notes:
(a) Per-student payments are based on Fiscal Year 2001 Impact Aid payments to the pre-merger Whisman School District. The Mountain View School District, prior to the merger, had not applied for aid in recent years.
(b) Per student payments are based on Fiscal Year 2000 Impact Aid payments to the Mountain View-Los Altos Union High School District, the last year the district applied for aid.
(c) The Mountain View-Whisman School District has a series of non-residential fees. The one used here is for office uses.
(d) Revenues calculated at buildout.
(e) Federal Impact Aid revenue is product of student forecasts (see Table 4.14-11) and per-student payments.
(f) Developer Fee Revenues are product of Developer Fees per square foot and square footage of corresponding use in Bay View.
(g) Impacts resulting from application of Mitigation SOCIO 1-B. See Chapter Five for additional detail on this alternative.

Alternative 5 is projected to generate approximately $58,291 in Federal Impact Aid.

Mitigated Alternative 5 is projected to generate approximately $87,048 in Federal Impact Aid.

iii. Revenue Limit

According to the structure of the public school finance system in California, school district revenue limits are established annually by the State Department of Education, based primarily on ADA. The revenue limit is composed of State-provided funding and property tax revenues. If a school district's property tax revenue allocations do not parallel the changes in the revenue limits, the State will adjust its contribution of operating revenues so that the district is funded to a new revenue limit. As enrollment changes at the local level, the amount of money available to the district on a per-student basis remains relatively constant, except for cost of living adjustments.

The additional students generated by the NADP, therefore, would contribute to an increased revenue limit for the Mountain View-Whisman School District. The increase is projected by calculating the current per-student revenue and applying that figure to the additional students generated by the NADP. The process is outlined in Table 4.14-13 and results are contained in Table 4.14-3.

Table 4.14-13 has three sections. The first section shows current per student revenue limit and expenditure data. The second portion determines the per student fiscal impact on the school districts, net of additional revenue limit funds from the state and federal impact aid (from Table 4.14-12). The final section then applies these net per student impacts to the number of students generated by each NADP alternative to determine the total fiscal impact on the school districts.

As shown in Table 4.14-3, Alternative 2 would generate approximately $347,165 in additional revenue limit funds for the District.

Table 4.14-13: School District Net Fiscal Impact Estimate

CURRENT REVENUE

District	2001/02 Revenue Limit	2001/02 Enrollment	Revenue Limit per Student
Mountain View-Whisman	**$20,562,089**	**4,300**	**$4,782**
Mtn View-Los Altos High	**$29,350,899**	**2,794**	**$10,505**

CURRENT EXPENDITURES (a)

District	2001/02 Expenditures	2001/02 Enrollment	Expenditures per Student
Mountain View-Whisman	**$23,398,496**	**4,300**	**$5,442**
Mtn View-Los Altos High	**$23,053,096**	**2,794**	**$8,251**

NET FISCAL IMPACT (PER STUDENT)

Impacts	Mountain View-Whisman District	Mtn View-Los Altos High (b)
Revenue Limit Funds/Basic Aid Amount	$4,782	$120
Federal Impact Aid Revenue	$589	$164
Total New Revenue per Student (c)	**$5,371**	**$284**
New Expenditures per Student	**$5,442**	**$8,251**
Net Impact	**($71)**	**($7,967)**

NET FISCAL IMPACT (TOTAL)

	Alternative Two	Alternative Three	Alternative Four	Alternative Five	Mitigated Alternative Five (d)
Estimated Additional Students					
Mountain View-Whisman District	73	40	102	99	148
Mountain View-Los Altos Union High School District	20	11	28	27	40
New Revenue					
Mountain View-Whisman District	$389,911	$212,679	$546,467	$531,697	$794,002
Mountain View-Los Altos Union High School District	$5,628	$3,070	$7,887	$7,674	$11,460
New Expenditures					
Mountain View-Whisman District	$395,054	$215,484	$553,674	$538,710	$804,473
Mountain View-Los Altos Union High School District	$163,368	$89,110	$228,963	$222,775	$332,677
Net Fiscal Impact Mtn View-Whisman District	**($5,142)**	**($2,805)**	**($7,207)**	**($7,012)**	**($10,471)**
Percent of Annual Revenue Limit	**0.03%**	**0.01%**	**0.04%**	**0.03%**	**0.05%**
Net Fiscal Impact Mtn View-Los Altos High	**($157,741)**	**($86,040)**	**($221,076)**	**($215,101)**	**($321,217)**
Percent of Annual Revenue Limit	**0.54%**	**0.29%**	**0.75%**	**0.73%**	**1.09%**

Notes:
(a) Excludes administrative salaries and benefits, as these costs are not expected to increase significantly with the influx of NRP students.
(b) As Mountain View-Los Altos Union High School District is a State Basic Aid District, it only receives $120 per additional ADA. Any additional increases in revenue limit funds through NADP buildout would come from an increase in local property tax values.
(c) Only includes annual revenue sources. Developer impact fees are one-time fees and are therefore excluded.
(d) Impacts resulting from application of Mitigation SOCIO 1-B. See Chapter Five for additional detail on this alternative.

Source: Mountain View-Whisman School District; Mountain View-Los Altos Union High School District; Bay Area Economics, 2002.

As shown in Table 4.14-3, Alternative 3 would generate approximately $189,362 in additional revenue limit funds.

As shown in Table 4.14-3, Alternative 4 would generate approximately $486,556 in additional revenue limit funds.

As shown in Table 4.14-3, Alternative 5 would generate approximately $473,406 in additional revenue limit funds.

As shown in Table 4.14-3, Mitigated Alternative 5, with the application of measure SOCIO-1b, would generate approximately $706,953 in additional revenue limit funds.

b. Costs

Current per-student expenditures were applied to the number of elementary and middle school students expected to be generated by the NADP alternatives to project additional costs to the District under each alternative. Administrative salaries and benefits were excluded since they would not increase significantly with the limited number of students generated by the alternatives.

Alternative 2 is projected to generate approximately $395,054 in additional costs to the Mountain View School District.

Alternative 3 is projected to generate approximately $215,484 in additional costs.

Alternative 4 is projected to generate approximately $553,674 in additional costs.

Alternative 5 is projected to generate approximately $538,710 in additional costs.

Mitigated Alternative 5 is projected to generate approximately $804,473 in additional costs.

c. Conclusions

Thanks to the revenue limit finance system, the additional students generated by NADP would have an insignificant impact on the Mountain View-Whisman School District's operational budget. The State Department of Education would adjust the District's revenue limit and its State aid to account for the increased number of students. Table 4.14-13 illustrates that per-student expenditures, when combined with the estimated Federal Impact Aid, roughly equal the marginal cost of the additional students. As such, the NADP generates no significant fiscal impact on the Mountain View-Whisman School District.

Alternative 2 is projected to generate a net annual cost impact of $5,142 to the Mountain View School District. This fiscal deficit is only 0.03 percent of the District's annual revenue limit, and therefore does not represent a significant fiscal impact.

Alternative 3 is projected to generate a net annual cost impact of $2,805 to the Mountain View School District. This fiscal deficit is only 0.01 percent of the District's annual revenue limit, and therefore does not represent a significant fiscal impact.

Alternative 4 is projected to generate a net annual cost impact of $7,207 to the Mountain View School District. This fiscal deficit is only 0.04 percent of the District's annual revenue limit, and therefore does not represent a significant fiscal impact.

Alternative 5 is projected to generate a net annual cost impact of $7,012 to the Mountain View School District. This fiscal deficit is only 0.03 percent of the District's annual revenue limit, and therefore does not represent a significant fiscal impact.

Mitigated Alternative 5 is projected to generate a net annual cost impact of $10,471 to the Mountain View School District. This fiscal deficit is only 0.05 percent of the District's annual revenue limit, and therefore does not represent a significant fiscal impact.

4. Mountain View-Los Altos Union High School District

This section documents the fiscal impacts on the Mountain View-Los Altos High School District.

a. Revenues

i. Developer Impact Fees

The Mountain View-Los Altos Union High School District receives an impact fee of $0.68/square foot for residential projects and $0.10/square foot for non-residential projects in the District's boundaries. This fee schedule is applied to the portion of ARC within the school district's boundaries and outside of exclusive federal legislative jurisdiction (i.e. the Bay View portion) to estimate additional revenue to the district.

Alternative 2 is projected to generate approximately $304,000 in Developer Impact Fees for the Mountain View-Los Altos Union High School District.

Alternative 3 is not projected generate any additional Developer Impact Fees.

Alternative 4 is projected to generate approximately $652,800 in Developer Impact Fees.

Alternative 5 is projected to generate approximately $622,000 in Developer Impact Fees.

Mitigated Alternative 5 is projected to generate approximately $845,240 in Developer Impact Fees.

ii. Federal Impact Aid

As stated in Section 3.14, the Mountain View-Los Altos Union High School District has not applied for Federal Impact Aid in recent years and does not anticipate doing so in the foreseeable future. However, the District may decide to apply for aid as a result of the increased students generated by the NADP. The following projections are provided to demonstrate how much additional revenue the District would receive should it decide to submit an application. Again, due to the numerous variables involved in calculating per-student aid payments, these projections should be treated as preliminary estimates.

The per-student payment from Fiscal Year 2000 (the last time the District applied for aid) was applied to the number of high school students generated by NADP.

Alternative 2 is projected to generate approximately $3,252 in Federal Impact Aid for the Mountain View-Los Altos Union High School District.

Alternative 3 is projected to generate approximately $1,774 in Federal Impact Aid.

Alternative 4 is projected to generate approximately $4,557 in Federal Impact Aid.

Alternative 5 is projected to generate approximately $4,434 in Federal Impact Aid.

Mitigated Alternative 5 is projected to generate approximately $6,622 in Federal Impact Aid.

iii. Revenue Limit/State Basic Aid

The Mountain View-Los Altos Union High School District is a State Basic Aid district. As discussed in Section 3.14, State Basic Aid districts' property tax revenues exceed their revenue limit. Consequently, the Mountain View-Los Altos Union High School District does not receive State aid towards its

revenue limit, and only receives a basic aid amount ($120 per ADA or $2,400 per district, whichever is greater) for each student. The District relies on additional property tax increment to maintain its existing per-student revenue limit amount.

The following analysis assumes the District remains a State Basic Aid district, and takes a highly conservative approach by assuming no additional property tax increment. Under these conditions, the District would only receive the basic aid amount for additional students generated by the NADP. The process is outlined in Table 4.14-13 and results are contained in Table 4.14-3.

Alternative 2 would generate an additional $2,376 in basic funds for the Mountain View-Los Altos Union High School District.

Alternative 3 would generate an additional $1,296 in basic aid funds.

Alternative 4 would generate an additional $3,330 in basic aid funds.

Alternative 5 would generate an additional $3,240 in basic aid funds.

Mitigated Alternative 5 would generate an additional $4,838 in basic aid funds.

b. Costs

To estimate additional costs to the Mountain View-Los Altos Union High School District, current per-student expenditures were applied to the number of high school students generated by the NADP.

As with the Mountain View-Whisman District, administrative salaries and benefits were excluded from the per-student expenditures. These costs would not increase significantly with the limited number of students generated by NADP. These calculations are contained in Table 4.14-13.

Alternative 2 is projected to generate approximately $163,368 in additional costs to the Mountain View-Los Altos Union High School District.

Alternative 3 is projected to generate approximately $89,110 in additional costs to the Mountain View-Los Altos Union High School District.

Alternative 4 is projected to generate approximately $228,963 in additional costs to the Mountain View-Los Altos Union High School District.

Alternative 5 is projected to generate approximately $222,775 in additional costs to the Mountain View-Los Altos Union High School District.

Mitigated Alternative 5 is projected to generate approximately $332,677 in additional costs to the Mountain View-Los Altos Union High School District.

c. Conclusions

Alternative 2 is projected to generate a net annual cost impact of approximately $157,741 for the Mountain View-Los Altos Union High School District. This fiscal deficit is 0.54 percent of the District's current revenue limit.

Alternative 3 is projected to generate a net annual cost impact of approximately $86,040 for the Mountain View-Los Altos Union High School District. This fiscal deficit is 0.29 percent of the District's current revenue limit. No adverse impact is generated.

Alternative 4 is projected to generate a net annual cost impact of approximately $221,076 for the Mountain View-Los Altos Union High School District. This fiscal deficit is 0.75 percent of the District's current revenue limit.

Alternative 5 is projected to generate a net annual cost impact of approximately $215,101 for the Mountain View-Los Altos Union High School District. This fiscal deficit is 0.73 percent of the District's current revenue limit.

Mitigated Alternative 5, with the application of measure SOCIO-1b, is projected to generate a net annual cost impact of approximately $321,217 for the Mountain View-Los Altos Union High School District. This fiscal deficit is 1.09 percent of the District's current revenue limit.

As discussed above, these net cost impacts are based on highly conservative assumptions regarding additional property tax increment. Specifically, the analysis assumes that property values will remain stagnant and the District would not receive any funding from additional tax increment over the next 11 years (assuming a buildout of 2013). However, it is highly likely that property tax values will increase and return the District's per-student revenue limit funds to their current level. The District is an exception from the typical California public school finance system in that it is a State Basic Aid District. This fact indicates that it already has a higher per-student revenue limit than other high school districts and that it maintains a strong financial position. With these factors in mind, the analysis concludes that under Alternatives 2, 4 and 5, increases in costs for high schools could exceed the revenue limit by more than 0.5 percent, creating a significant impact. This would be true under the Mitigated Alternative 5 as well. NADP impact on the Mountain View-Los Altos Union High School District may be reviewed upon buildout of NADP and establishment of the actual number of high school students generated by on-site housing.

5. San Francisco Water Department and East Bay Municipal Utilities District

Existing ARC facilities receive potable water and fire protection supply from the San Francisco Water Department (SFWD). Approximately 85 percent of this water comes from the SFWD's Hetch Hetchy Reservoir, which gets about 15 percent of its water from East Bay Municipal Utility District (EBMUD) sources. According to SFWD and EBMUD officials, the fees collected for these services are calculated such that the systems pay for themselves, without subsidy from other revenue sources. The provision of these services to ARC after implementation of the NADP should not result in any net fiscal impact to the water service providers.

6. Sunnyvale Water Pollution Control Plant and Palo Alto Regional Water Quality Control Plant

Sewer service providers set their rate structure to assure that the services are fully paid for by users. Therefore, no net fiscal impact is anticipated.

7. Cumulative Impacts

As noted above, the cumulative projects identified in Chapter 2 are primarily employment-generating, with relatively few residential projects. One of the benefits of such projects for local governments is that they produce greater tax revenues than they do service demands and costs. Thus the cumulative projects analyzed in this EIS would have a net positive impact on local fiscal conditions.

D. Environmental Justice Impacts

Because none of the proposed alternatives for new development at Ames Research Center would include new uses with substantial direct noise or air quality impacts, the primary potential source of environmental justice issues would be the noise and air pollution associated with increases in automobile traffic and construction until new development under the NADP was completed. The environmental justice analysis in Section 3.14, analyzed the 15 census tracts that lie along Highway 101 within 5 kilometers (3 miles) of Ames Research Center for disproportionate impacts on minority and low income communities.

1. Minority Populations

Taken together, the 15 tracts within 5 kilometers (3 miles) of Ames Research Center have an ethnic breakdown almost identical to Santa Clara County as a whole. Of the census tracts that meet the HUD definition of minority communities, only five have a minority population substantially higher than the County average, while four have a minority population substantially smaller than the County average. All of these tracts would be affected similarly. Thus there would be no disproportionate affects on minority communities from traffic generated by the implementation of the NADP.

2. Low Income Populations

In terms of proportion of low-income households, the 15 census tracts have a rate of low- and very low-income households of 21.8 percent and 22.7 percent respectively. This is just under 5 percent higher than the Santa Clara County

average of 18.3 percent low income and 21.4 percent very low income, but would not be considered a significant difference. Thus there would be no disproportionate affects on low income populations in Santa Clara County from traffic generated by implementation of the NADP.

3. Berry Court and Orion Park Military Housing Areas

Because the Berry Court and Orion Park Military Housing areas are immediately adjacent to Ames Research Center, they would be the neighborhoods most heavily affected by any impacts from implementation of the NADP. It is thus appropriate to examine potential environmental justice impacts upon them in more detail.

Berry Court contains the only permanent residences in Census Tract 5047. The percentages of low income and minority populations living in Berry Court are lower than those in Santa Clara County as a whole, therefore Berry Court is neither a low income community nor a minority community, and impacts on Berry Court would not be considered environmental justice impacts.

Orion Park is located in Census Tract 5046.01, which has a low income population substantially higher than that in Santa Clara County as a whole. New construction in the Bay View area under Alternatives 2, 4 and 5 would lead to heavy truck traffic along R.T. Jones Road, which provides access to Orion Park. However, there would be no significant environmental justice impacts on Orion Park from these trucks for two reasons. First, there would be an average of approximately 45 to 60 trucks per day along R.T. Jones Road, which would not be a sufficient number to create significant congestion, noise, or air quality impacts. Second, this number of trucks would have little effect on Orion Park because only one residential building has back windows facing out onto R.T. Jones Road. The remainder of Orion Park is buffered from R.T. Jones Road by a wide expanse of open space.

Thus there would be no environmental justice impacts on the two military housing areas at Moffett Field.

4. Cumulative Impacts

Since the alternatives would not create any impacts whatsoever in regard to environmental justice, there would be no possibility for impacts from the NADP to combine with impacts from cumulative projects to create cumulative impacts in this regard.

E. Impacts and Mitigation Measures

This section summarizes significant impacts identified in Section B. None of the alternatives generates a significant fiscal impact on local jurisdictions or school districts, nor a significant impact with regard to environmental justice. Therefore no mitigation measures are necessary regarding these issues.

Impact SOCIO-1: Alternatives 2 through 5 would generate one percent or more of the new households in the Housing Impact Area between 2000 and 2015 and contribute to the regional jobs-housing imbalance.

Applicable to: Alternatives 2 through 5

Mitigation Measure SOCIO-1a: NASA will continue to attempt to acquire the rights to occupy as much of the Department of Defense (DOD) housing located at Moffett Field as possible to bolster the projected supply provided under each of the alternatives.

Mitigation Measure SOCIO-1b: In the Mitigated Alternative 5, NASA would require the provision of 1,120 townhome and apartment units in the Bay View area, and 810 student apartment and dormitory units in the NRP area. If this level of housing development could not be achieved, NASA would commensurately scale back the employment and student generating components of the project.

The provision of these units could have the potential to create secondary impacts in the areas of traffic, air quality, infrastructure, services, noise and

fiscal impact. These impacts are discussed in detail in Chapter 5. The analysis of these potential impacts concludes that there would be no significant impacts beyond those disclosed in the DPEIS. In fact, traffic impacts would be lessened. Infrastructure, service, and fiscal impacts would be mitigated through the payment of fair share contributions to sewer infrastructure and through Developer Impact Fees to offset impacts to schools, libraries and recreational programs in the City of Mountain View. Although residential uses in Building 20 would be within a 70dB noise exposure contour, this is considered conditionally acceptable by HUD and California Planning Guidelines, although not by Santa Clara County. Building 19 would be in a noise exposure area of 70 to 75 dB, which is above California Planning Guidelines conditionally acceptable levels, but is still conditionally acceptable to HUD. These noise impacts would be mitigated to less than significant levels.

Mitigation Measure SOCIO-1c: NASA would continue to evaluate the possibility of constructing housing above retail uses proposed in the NRP area.

Mitigation Measure SOCIO-1d: NASA would require at least 10 percent of the on-site housing to be affordable to low income households.

These four mitigation measures would not completely mitigate the impact. The Bay Area, and Santa Clara County in particular, has one of the most competitive housing markets in the nation. Housing demand far outstrips supply throughout the region, and the additional jobs generated by the NADP would contribute to the regional housing demand. Even with mitigation, the alternatives would generate workers who would not be housed on-site who would represent over one percent of the predicted new households in the Housing Impact Area through 2015. Hence, this impact would be significant and unavoidable.

Impact SOCIO-2: Alternative 3 would generate a net negative fiscal impact on the City of Mountain View, due in particular to increased demands on recreational and library facilities.

Applicable to: Alternative 3

Mitigation Measure SOCIO-2: NASA, in collaboration with its Partners, would provide on-site library and recreation facilities. These would include community rooms within the residential portions of the project, an on-site fitness center, and reading rooms and libraries as part of the University-related uses.

Impact SOCIO-3: Under Alternatives 2, 4, 5, and Mitigated Alternative 5, increases in costs generated by ARC high-school students could exceed 0.5 percent of the Mountain View-Los Altos Union High School District annual revenue limit.

Applicable to: Alternatives 2, 4, 5 and Mitigated Alternative 5

Mitigation Measure SOCIO-3: NASA and the Mountain View-Los Altos Union High School District will negotiate an agreement whereby in any given year, should the Mountain View-Los Altos Union High School District's per student operating revenues decrease below a pre-determined baseline as a direct result of enrollment generated by the NADP, NASA or its partners will compensate the District for the shortfall associated with these students. The baseline would be set to the District's per student operating revenues in the year prior to when students residing at ARC first begin attending classes in the District, and would be adjusted for cost of living and inflationary changes over time.

5 ANALYSIS OF MITIGATED ALTERNATIVE FIVE

In response to comments received during the public review period for the Draft Programmatic EIS (DPEIS) on the NASA Ames Development Plan (NADP), NASA has added to the Final Programmatic EIS Mitigation Measure SOCIO-1b, which would increase the amount of housing to be built on-site under the NADP. This new mitigation measure would apply to Alternative 5 only. The Mitigated Alternative 5 is the new Preferred Alternative.

This appendix contains several analyses of this increased housing:

- Chapter 5.1 is a conceptual description of the way that this additional housing could be incorporated into Alternative 5.
- Chapter 5.2 contains an analysis justifying the market demand for the proposed additional housing
- Chapters 5.3 through 5.9 contain analyses of the potential for secondary impacts on traffic, air quality, infrastructure, noise and fiscal conditions that could result from the implementation of Mitigation Measure SOCIO-1b.

As described in each analysis, the proposed housing would fit on the site, would not exceed market demands, and would not create any additional significant impacts over those already disclosed in the DPEIS.

5.1 CONCEPTUAL HOUSING PLAN

This chapter contains a conceptual description of the ways that Alternative 5 would accommodate the additional housing foreseen in Mitigation Measure SOCIO-1b.

Under this conceptual plan, additional housing would be built in both the NASA Research Park (NRP) and Bay View areas.

A. Land Use

Table 5.1-1 and Figure 5.1-1 show a conceptual land use plan and development summary for configuration changes that would accommodate the additional housing foreseen under Mitigation Measure SOCIO-1b. As shown in the table and the figure, the land use plan would be changed in the following ways:

1. NRP Area

To accommodate additional housing, the following changes would be made to Alternative 5 in the NRP Area:

- The land area of NRP Parcel 1, which is proposed to accommodate the Lab Project proposed under the baseline, would be decreased. The development potential of this parcel could be kept the same through an increase in the parcel's allowed FAR.
- The land area of NRP Parcel 6, which is proposed for housing, would be increased, with a corresponding increase in its development potential.
- A portion of Buildings 19[1] and 20 would be redesignated for use as dormitory housing. This would be in keeping with the historic use of these buildings, which were originally built as enlisted men's and officer's housing respectively.

[1] 90,000 square feet of Building 19 would remain office space.

Table 5.1-1: Potential Reconfiguration of Alternative 5 to Accommodate Additional Housing

Parcel		Land Use		Parcel Area (HECT)	Parcel Area (AC)	FAR	Developable Area (MS)	Developable Area (SF)
Ames Campus	1	ARC Facilities		89.03	*220.01*	0.31	277,748	*2,989,658*
	2	Preserve		3.15	*7.78*	N/A		*N/A*
	3	Recrea ion		1.62	*4.01*	N/A		*N/A*
		Sub Total		**93.8**	*231 8*		**277,748**	*2,989,658*
NASA Research Park	1	Lab Project	*	2.43	*6.00*	N/A	11,148	*120,000*
	2	Lab Project	*	7.90	*19.53*	0.71	55,742	*600,000*
	3	University Reserve		1.03	*2.53*	0.75	7,711	*83,000*
	4	Partner Parcel		1.50	*3.70*	0.18	2,661	*28,645*
	5	University Reserve		11.58	*28.60*	0.75	86,864	*935,000*
	6	University Reserve		3.81	*9.42*	1.15	43,850	*472,000*
	7	Computer Museum		1.26	*3.11*	0.88	11,148	*120,000*
	8	Partner Parcel		2.43	*6.00*	0.75	18,116	*195,000*
	9	Gateway Parcel		0.26	*0.65*	N/A	N/A	*N/A*
	10	Partner Shared		0.77	*1.91*	N/A	N/A	*N/A*
	11	Partner Shared		1.36	*3.35*	0.08	1,115	*12,000*
	12	Historic District	*	7.91	*19.55*	N/A	8,268	*89,000*
	12a	Historic District					17,280	*186,000*
	13	Historic District Infill		2.59	*6.40*	0.75	19,510	*210,000*
	14	Historic District Infill		0.87	*2.15*	0.27	2,323	*25,000*
	15	Historic District Infill		1.06	*2.62*	0.35	3,716	*40,000*
	16	Partner Parcel		1.85	*4.56*	0.35	6,503	*70,000*
	17	Historic Dist Reno		1.72	*4.26*	N/A	4,181	*45,000*
	18	C.Air & Space Cntr.		5.70	*14.09*	0.81	46,452	*500,000*
	19	Preserve		8.70	*21.50*	N/A	N/A	*N/A*
	X	No Change (H D)		N/A	*N/A*	N/A	869	*9,355*
		Sub Total		**64.7**	*159 9*		**347,457**	*3,740,000*
Eastside / Airfield	1	A/C Control Tower		0.19	*0.46*	0.60	1,114.8	*12,000*
	2	Preserve		9.82	*24.26*	N/A	N/A	*N/A*
	3	Open Space		59.53	*147.11*	N/A	N/A	*N/A*
	X	No Change		25.03	*61.84*	N/A	79,862.8	*859,636*
		Sub Total		**94.6**	*233.7*		**80,978**	*871,636*
	A	CANG Master Plan (EA)	**					
Bay View	1	Housing		9.33	*23.06*	1.19	111,019	*1,195,000*
	2	Education Reserve		0.93	*2.30*	0.48	4,459	*48,000*
	3	NASA Reserve		2.05	*5.06*	N/A	N/A	*N/A*
	4	Recrea ion		1.63	*4.02*	N/A	N/A	*N/A*
	5	Recrea ion		2.98	*7.37*	N/A	N/A	*N/A*
	6	Preserve		6.16	*15.22*	N/A	N/A	*N/A*
	7	Preserve		4.81	*11.89*	N/A	N/A	*N/A*
	8	Open Space		2.57	*6.35*	N/A	N/A	*N/A*
	9	Open Space		0.90	*2.23*	N/A	N/A	*N/A*
	10	Open Space		4.52	*11.17*	N/A	N/A	*N/A*
	11	Open Space		3.02	*7.46*	N/A	N/A	*N/A*
		Sub Total		**38.9**	*96.1*		**115,478**	*1,243,000*
Total							**821,662**	*8,844,294*
	A	CANG Master Plan(EA)	**	44.52	*110.00*	N/A	6,020	*64,800*
		Exis ing CANG Facilities		N/A	N/A	N/A	20,717	*223,000*

* *"Preapproved pursuant to the 1994 NASA/MFA Environmental Assessment - Comprehensive Use Plan"*

** *"Preapproved pursuant to the CANG EA Master Plan - Square footage not included in totals*

FIGURE 5.1-1

MITIGATED ALTERNATIVE FIVE

LEGEND:

- Partner Parcel
- Community Support
- University Reserve
- NASA Reserved
- Recreation
- Relocated AT Control Tower
- Housing - Bay View
- Housing - NRP
- California Air and Space Center
- Historic District Infill
- Historic District Renovation
- Historic Buildings
- Computer Museum
- Supporting Retail
- Light Rail
- Preserve (Burrowing Owl)
- Open Space
- Wetlands
- Fence Line

Denotes Parcel Number as Noted on Table 5.1-1

- (1) Ames Campus
- (1) NASA Research Park
- (1) Eastside / Airfield
- (1) Bay View

* A portion of Building 19 will remain offices

DMJMH+N EDAW

0 76m 152m 305m
0 250ft 500ft 1000ft

NASA AMES RESEARCH CENTER
NASA AMES DEVELOPMENT PLAN FINAL EIS

2. Bay View Area

To accommodate additional housing, the following changes would be made to Alternative 5 in the Bay View Area:

- The land area of Bay View Parcel 1, which is designated for housing development, would be increased, as would the parcel's allowed FAR. This would create the potential for a significantly larger housing development on the parcel.
- The land area of Bay View Parcel 2 would be decreased, resulting in a smaller development potential.
- Despite the increase in housing potential, there would still be room to increase the buffer between the wetlands and development, as required in Mitigation Measure BIO-19 as added in this Final EIS. The buffer area would be increased by distributing the open space in Parcel 10 in a new configuration, while leaving Parcel 10's land area the same.

3. Other Areas

The changes to the Bay View would result in a small decrease to the area of Ames Campus Parcel 1. This would not, however, reduce the expected build-out of the Ames Campus.

Otherwise, proposed land uses for the Eastside/Airfield and the Ames Campus area would not be affected by the implementation of Mitigation Measure SOCIO-1b.

B. Potential Housing and Population

Table 5.1-2 provides a summary of the potential unit counts and population that would be accommodated in both the NRP and Bay View areas with the changes to Alternative 5 described above.

TABLE 5.1-2 **ALTERNATIVE 5 WITH HOUSING MITIGATION - POTENTIAL HOUSING, POPULATION AND PARKING**

Location	Parcel Area (ha)	Parcel Area (Ac)	FAR	Developable Area (sf)	Housing Type	Square Feet per Housing Type	Number of Units	Persons/ Unit	Population	Parking Calculations
NRP Area:										
Building 19	NA	NA	NA	138,000	Dorm	600	160	2	320	216
Building 20	NA	NA	NA	30,000	Dorm	150-250	60	1	60	81
Parcel 6	3.69	9.42	1.15	472,000	Dorm/Apt.	800	590	2	1,180	796
NRP Total				**648,000**			**810**		**1,560**	**1,093**
Bay View Area:										
Parcel 1	9.33	23.06	1.19	1, 195,000						
					Townhome	1,300	250	2.99	748	337
					Apartment	1,000	870	2.99	2,601	1,174
Bay View Total				**1,243,000**			**1,120**		**3,349**	**1,511**
TOTAL				**1,891,000**			**1,930**		**4,909**	**2,604**

Notes:

1. Building 19 is within NRP Parcel 12. Building 20 is within NRP Parcel 12a.
2. Building 19 was under office use in Alternative 5 as analyzed in the Draft Programmatic EIS.
3. Building height in NRP Parcel 6 would range from 3-4 stories depending on the layout and parking. A parking structure would be required at this density.
4. Building heights in Bay View Parcel 1 would range from 4-5 stories depending on the layout and parking.
5. Parking calculations are based on the following equation: ((number of units x 1.25) + 1 visitor for every 10 units)

Table 5.1-2 is based on the following assumptions regarding the types of units that might be built under the NADP:

- All housing in the NRP would be student apartments and dormitories, with both one and two person units. Building 19 and the new housing to be constructed in Parcel 6 would be developed with 600- to 800-square foot student apartment units holding two students or employees each. Building 20 would contain one-person units of 150 to 250 square feet.
- Townhomes to be built in the Bay View area would be increased in size over those assumed for Alternative 5 in the DPEIS, with 1,300-square foot units instead of 1,200-square foot units.
- In addition to the townhomes, Bay View housing would include apartments, which would be 1,000-square foot units.

The amount of housing that could be built with these changes would differ from that originally proposed under Alternative 5 in several ways:

- In the NRP area, 810 dormitory units would be provided, as compared to 290 under Alternative 5 without mitigation.
- In the Bay View area, 1,120 townhomes and apartment units would be provided, as compared to 750 under Alternative 5 without mitigation.
- The total number of housing units in both areas would be 1,930 units, as compared to 1,040 units proposed under Alternative 5 without mitigation.

The resulting housing population in the NRP and Bay View areas would be 4,909 people. Of these, 1,560 would live in student apartments and dormitories in the NRP area, 748 would live in townhomes in the Bay View area, and the remaining 2,601 would live in apartments in the Bay View area.

As shown in Table 5.1-3, the total NRP-based employees and students would be 1,560. The total Bay View-based employees and students would be 1,400.

TABLE 5.1-3 **EMPLOYEE/STUDENT CAPTURE**

	Housing Type	Number of Units	Persons Per Unit	Total Population
NRP Area:				
Building 19	Dormitory	160	2	320
Building 20	Dormitory	60	1	60
Parcel 6	Dormitory	590	2	1,180
Total NRP				1,560
Bay View Area:				
	Townhome	250	1.25	313
	Apartment	870	1.25	1,088
	Dormitory	0	2	0
Total Bay View				1,400
TOTAL				**2,960**

C. Employee and Student Capture

The student apartments and dormitories in the NRP area would be open only to students and employees at ARC. Townhomes and apartments and in the Bay View would be open to families in which at least one adult is an employee or student at ARC, but it is reasonable to assume that at least some of the Bay View housing would accommodate households in which two people work or study at ARC.

For planning purposes, NASA assumes that an average of 1.25 employees or students would live in each Bay View housing unit. This assumption is based on actual surveyed conditions at the Presidio in San Francisco, which is the best comparison data available. See Section 5.2 for more details on the expected demand.

Based on these assumptions, the housing that would be built under Alternative 5 with the modifications to accommodate Mitigation Measure SOCIO-1b would accommodate a total of 2,960 ARC employees and students, as shown in Table 5.1-3.

5.2 HOUSING DEMAND ANALYSIS

This chapter explores the housing demand from new employees and students at the ARC to understand whether there would be sufficient demand to justify the number and types of on-site housing units foreseen in Mitigation Measure SOCIO-1b. This analysis was conducted for NASA by Bay Area Economics (BAE).

A. Demand for Apartments and Townhomes

Bay Area Economics (BAE) developed a housing demand model to analyze the likely demand for housing that would arise from non-residential uses at ARC. The ARC housing demand model generated a preliminary estimate of demand for housing on-site at ARC with a breakdown of supportable rental rates. This information will be used by NASA planners and partners to refine proposed housing programs and ensure that on-site housing proposed under the NADP meets the needs of employees and students.

The model does not assume that all employee or student households are likely to demand housing at ARC. Instead, a predictable subset of households are predicted to form the core of demand. This preliminary demand is then translated into rents and unit types.

It should be noted that while this analysis is suited for planning purposes, more detailed demand and affordability studies will be required as specific housing programs are formulated by ARC Partners during NADP implementation.

1. Demand Model Methodology

The ARC housing demand model calculates demand for on-site units based on employee households. It treats student household demand separately, since student housing demand is highly specific to the university partner program.

The model generates estimates of employee on-site housing demand through the following steps:

- **Step 1: Identify Non-residential Land Uses.** The model uses the non-residential land uses proposed under Mitigated Alternative 5 in the

NADP EIS as the basis for employee projections and resulting housing demand estimates. These land uses include Office/R&D, Low Density Office/R&D, University Lab space, University Office, Public/Museum, Conference and Training Center, and Retail uses, and are listed in Table 5.2-1.

— **Step 2: Assign Census Industry Categories to Land Uses.** In order to predict the range of occupations at ARC, BAE identified a set of U.S. Census Industry Categories associated with each land use. This process is illustrated in Table 5.2-1. Each Census Industry Category encompasses one or more 3-digit SIC codes.

  For the Office/R&D and Low Density Office/R&D land use categories, BAE benchmarked Census Industry Categories against high-technology industry definitions employed in studies by Joint Venture Silicon Valley (JVSV), a non-profit economic development advocacy organization. Specifically, the model used a set of Census Industry Categories that match the "Semiconductors and Semiconductor Equipment," "Computer and Communication," and "Software" industry SIC codes, as defined by JVSV. For the Retail use, BAE assumed a set of Industry Categories that match NASA's preliminary plans for on-site retail development.

— **Step 3: Determine Percent Distribution of Occupation Categories for Each Land Use.** Using 1990 Census Public Use Microdata Sample (PUMS) data for the nine-county San Francisco Bay Area, BAE determined the percent distribution of occupation categories associated with each set of Census Industry Categories and each land use. Note that 2000 PUMS data were not available at the time of this writing. Table 5.2-1 contains this data.

— **Step 4: Formulate Employee Profiles within Each Occupation.** Again using 1990 PUMS data, BAE created a demographic profile of employee households for each NADP land use category and for each occupation. The median household income, housing tenure, housing type, percent of total households renting units in multifamily structures, and median number of rooms per unit were generated through custom, cross-tabulated

runs of PUMS data. The model inflated the reported 1989 median household income to 2002 dollars using an inflator derived from Claritas, Inc, a private data vendor. The results of this demographic analysis are presented in Table 5.2-2.

— **Step 5: Allocate NADP-Generated Employees to Occupation Categories.** To determine the total number of employees per NADP land use, BAE assumed industry standard employment densities (presented in Table 5.2-3 and consistent with the factors used for the NADP FEIS). These densities were applied to the land use program for Mitigated Alternative 5 (see Table 5.2-3). The occupation category distribution for each land use (extracted in Step 3) was then applied to the total number of employees. Table 5.2-4 summarizes the results of this step.

— **Step 6: Determine Housing Need and Demand.** The next step of the process, shown in Table 5.2-5, was to identify the number of employee households that would demand on-site housing. It was also assumed that households currently living in a single-family home or owning their residence would not choose to relocate to on-site housing. Given these assumptions, the percentage of households renting multifamily housing (extracted in Step 4) was applied to the total number of employees in each occupation category.

This process resulted in the preliminary calculation of the number of employees that might reside in ARC housing. This number of employees was then translated into households, assuming a minimum of one employee per household, per NASA's policy of maintaining at least one ARC employee in every unit.

As a final step, it was assumed that 50 percent of these households would actually choose to move to ARC. This assumption was based on results of a 1999 survey administered by the Presidio Trust to Presidio-based employees. The survey found that 57 percent of employees working at

Table 5.2-1: Occupational Categories Used for Analysis

NRP Land Use Category	Corresponding Census Industry Category and Associated SIC Codes	Occupation Categories	Distribution of Occupations in Industry Group (a)
Office/HD R&D LD R&D/Indust	Computers and related equipment (3571-3577) Machinery, except electrical, n.e.c. (355,356,358,359) Radio, TV, and communications equipment (365,366) Electrical machinery, equipment, and supplies, n.e.c. (361,362,364,367,369) Scientific and controlling instruments (381,382 except 3827) Computer and data processing services (737)	Managerial and Professional Specialty Technical, Sales, and Administrative Support Service Precision Production, Craft, and Repair Operators, Fabricators, and Laborers	44.6% 30.4% 1.0% 13.1% 10.9%
University: Academic Uses	Colleges and universities (822)	Managerial and Professional Specialty Technical, Sales, and Administrative Support Service Groundskeepers and Gardeners (b) Precision Production, Craft, and Repair Operators, Fabricators, and Laborers	61.3% 29.3% 5.8% 0.5% 1.6% 1.5%
University: Partner Uses	Computers and related equipment (3571-3577) Machinery, except electrical, n.e.c. (355,356,358,359) Radio, TV, and communications equipment (365,366) Electrical machinery, equipment, and supplies, n.e.c. (361,362,364,367,369) Scientific and controlling instruments (381,382 except 3827) Computer and data processing services (737)	Managerial and Professional Specialty Technical, Sales, and Administrative Support Service Precision Production, Craft, and Repair Operators, Fabricators, and Laborers	44.6% 30.4% 1.0% 13.1% 10.9%
Public/Museum	Museum, art galleries, and zoos (84)	Managerial and Professional Specialty Technical, Sales, and Administrative Support Service Groundskeepers and Gardeners (b) Precision Production, Craft, and Repair Operators, Fabricators, and Laborers	53.3% 30.2% 9.5% 3.5% 2.8% 0.7%
Conf/Training	Hotels and motels (701)	Managerial and Professional Specialty Technical, Sales, and Administrative Support Service Groundskeepers and Gardeners (b) Precision Production, Craft, and Repair Operators, Fabricators, and Laborers	18.0% 18.1% 56.5% 0.5% 2.8% 4.1%

Retail	Variety stores (533) Miscellaneous general merchandise stores (539) Retail bakeries (610) Eating and drinking places (58) Drug stores (591) Book and stationery stores (5942,5943) Gift, novelty, and souvenir shops (5947) Retail florists (5995) Miscellaneous retail stores (593,5948,5993-5995,5999)	Managerial and Professional Specialty Technical, Sales, and Administrative Support Service Groundskeepers and Gardeners (b) Precision Production, Craft, and Repair Operators, Fabricators, and Laborers	13.9% 29.5% 50.7% 0.2% 1.8% 3.9%
Recreation	PUMS data lacks a precise category for physical fitness facilities and similar recreational uses. Therefore, this analysis uses the industry categories and occupational distribution for Retail as a substitute for the Recreation industry.	Managerial and Professional Specialty Technical, Sales, and Administrative Support Service Groundskeepers and Gardeners (b) Precision Production, Craft, and Repair Operators, Fabricators, and Laborers	13.9% 29.5% 50.7% 0.2% 1.8% 3.9%
Support	Child day care services (835)	Managerial and Professional Specialty Technical, Sales, and Administrative Support Service Groundskeepers and Gardeners (b) Operators, Fabricators, and Laborers	45.0% 2.8% 51.9% 0.1% 0.2%

Notes:
(a) Total sample population includes employees in the nine-county Bay Area.
(b) Groundskeepers and Gardeners are included in the Farming, Forestry, and Fishing occupations.

Table 5.2-2: Potential Resident Profiles

Occupation Categories by Land Use	% of Employees Renting & Living in Multifamily Unit (a)	1989 Median Household Income	Inflated 2002 Median Household Income (b)	Median # of Rooms (c)
Office/HD R&D and LD R&D/Indust (d)				
Managerial and Professional Specialty	21.9%	$50,000	$88,500	4
Technical, Sales, and Administrative Support	27.9%	$41,100	$72,747	3
Service	33.6%	$34,500	$61,065	3
Precision Production, Craft, and Repair	26.5%	$38,000	$67,260	3
Operators, Fabricators, and Laborers	29.0%	$34,000	$60,180	4
University: Academic Uses				
Managerial and Professional Specialty	30.2%	$30,648	$54,247	4
Technical, Sales, and Administrative Support	33.4%	$28,950	$51,242	4
Service	33.6%	$29,736	$52,633	4
Groundskeepers and Gardeners (e)	47.1%	$37,000	$65,490	3
Precision Production, Craft, and Repair	23.6%	$41,900	$74,163	3
Operators, Fabricators, and Laborers	18.6%	$19,580	$34,657	4
University: Partner Uses				
Managerial and Professional Specialty	21.9%	$50,000	$88,500	4
Technical, Sales, and Administrative Support	27.9%	$41,100	$72,747	3
Service	33.6%	$34,500	$61,065	3
Precision Production, Craft, and Repair	26.5%	$38,000	$67,260	3
Operators, Fabricators, and Laborers	29.0%	$34,000	$60,180	4
Public/Museum				
Managerial and Professional Specialty	42.2%	$33,300	$58,941	3
Technical, Sales, and Administrative Support	47.6%	$25,637	$45,377	3
Service	41.3%	$19,200	$33,984	3
Groundskeepers and Gardeners	27.7%	$20,200	$35,754	3
Precision Production, Craft, and Repair (f)	0.0%	NA	NA	NA
Operators, Fabricators, and Laborers (f)	0.0%	NA	NA	NA
Conference/Training				
Managerial and Professional Specialty	38.0%	$38,741	$68,572	4
Technical, Sales, and Administrative Support	41.3%	$34,000	$60,180	4
Service	46.9%	$28,513	$50,468	3
Groundskeepers and Gardeners	24.9%	$29,740	$52,640	2
Precision Production, Craft, and Repair	28.8%	$38,600	$68,322	4
Operators, Fabricators, and Laborers	39.6%	$32,946	$58,314	3

Retail				
Managerial and Professional Specialty	30.2%	$35,980	$63,685	4
Technical, Sales, and Administrative Support	30.5%	$28,800	$50,976	4
Service	40.5%	$27,000	$47,790	3
Groundskeepers and Gardeners	40.2%	$36,000	$63,720	4
Precision Production, Craft, and Repair	38.4%	$28,000	$49,560	3
Operators, Fabricators, and Laborers	33.3%	$29,561	$52,323	3
Recreation (g)				
Managerial and Professional Specialty	30.2%	$35,980	$63,685	4
Technical, Sales, and Administrative Support	30.5%	$28,800	$50,976	4
Service	40.5%	$27,000	$47,790	3
Groundskeepers and Gardeners	40.2%	$36,000	$63,720	4
Precision Production, Craft, and Repair	38.4%	$28,000	$49,560	3
Operators, Fabricators, and Laborers	33.3%	$29,561	$52,323	3
Support				
Managerial and Professional Specialty	26.6%	$31,425	$55,622	4
Technical, Sales, and Administrative Support	27.5%	$35,962	$63,653	4
Service	26.9%	$20,900	$36,993	4
Groundskeepers and Gardeners (e)	100.0%	$37,000	$65,490	3
Operators, Fabricators, and Laborers	42.6%	$26,946	$47,694	4

Notes:

(a) Total sample population includes employees in the nine-county Bay Area.

(b) Incomes are from 1990 census inflated to 2002 dollars using an inflator derived from household income estimates by Claritas, Inc. Inflator: 1.77

(c) Rooms exclude bathrooms, porches, balconies, foyers, halls, and half-rooms.

(d) For the purposes of this analysis, no distinction is drawn between the personal and household characteristics of workers in the Office/HD R&D and LD R&D/Indust land uses.

(e) Due to small sample size, household income and room data for the Groundskeepers and Gardeners occupation within the University and Support industries are medians from all NRP industries combined.

(f) The PUMS data indicates that no Precision Production, Craft, and Repair or Operators, Fabricators, and Laborers employees in the Public/Museum industry live in rental multifamily housing in the Bay Area.

(g) Due to the lack of a census industry category that precisely identifies physical fitness centers and similar facilities, this analysis assumes the same housing pattern and income for Recreation employees as Retail employees.

(h) All income and room data are for persons living in rental multifamily housing. This is the population expected to demand housing at NRP.

Sources: 1990 U.S. Census of Population, Public Use Microdata Samples; Claritas, Inc.; Bay Area Economics, 2002.

Table 5.2-3: Employee Densities and Projections

EMPLOYMENT DENSITIES

Land Use	Density	Data Source
Office/HD R&D	279 gross square feet per employee	ITE code 750
LD R&D/Indust	405 gross square feet per employee	ITE code 760
University		
High Density Classroom	188 gross square feet per employee	Mission Bay EIR
Office	279 gross square feet per employee	ITE code 750
Low Density Classroom (a)	0 gross square feet per employee	Mission Bay EIR
Public/Museum (b)	115 staff per million annual visitors	USAF Museum - Dayton, OH
Conf/Training	1 employee per room	Fort Baker EIS
Retail		
Standard Retail	500 gross square feet per employee	ITE code 814
Other Support Space (c)	390 gross square feet per employee	See footnote (c)
Recreation (d)	625 gross square feet per employee	See footnote (d)
Support (e)	500 gross square feet per employee	See footnote (e)

EMPLOYMENT PROJECTIONS

Employee Generating Land Use	Proposed Space/Visitors/Rooms	Estimated Employment
Office/HD R&D (f)	948,645 gross square feet	2,358
LD R&D/Indust	12,000 gross square feet	30
University (g)	968,000 gross square feet	4,032
High Density Classroom	*484,000 gross square feet*	*2,574*
Office	*406,560 gross square feet*	*1,457*
Low Density Classroom	*77,440 gross square feet*	-
Public/Museum	1 million visitors	115
Conf/Training	250 rooms	250
Retail	100,000 gross square feet	214
Standard Retail	*75,000 gross square feet*	*150*
Other Support Space	*25,000 gross square feet*	*64*
Recreation	25,000 gross square feet	40
Support	25,000 gross square feet	50
	Total Employees	**7,088**

Notes:
(a) UCSF Campus Planning states that low-density classrooms do not generate significant employees.
(b) The complex and unique nature of the proposed museum space proh bits the use of square footage to project employees. Instead, the USAF Museum in Dayton, OH was used as a proxy to project daily staff. The USAF museum has a similar program and a comparable number of annual visitors. NASA estimates 1 million annual visitors to the museum space, while the USAF Museum sees 1.2 million visitors a year.

(c) Includes a variety of uses including student meeting rooms and other community services. Employee density is an average of Office/HD R&D and Standard Retail.
(d) Primarily includes health club facilities. Calls to comparable Bay Area health clubs were made to determine average employment density.
(e) Primarily includes child care space. Projection factor is function of legally mandated area per child (35 indoor sqft/child; another 15 sqft for non usable indoor space was added) and legally mandated staff to child ratio (average of 10 to 1).
(f) For Alternative Five only, 500,000 square feet of Office/HD R&D space is allocated to the ARC. Employee densities at ARC are expected to be 667 square feet per employee, leading to a total employee population of 750 at ARC. Other Office/HD R&D space at NRP will have 279 square feet per employee, leading to 1,608 employees in other NRP areas, and a total of 2,358 employees throughout NASA Ames.
(g) University Use Breakdown:

High Density Classroom	50%
Office	42%
Low Density Classroom	8%

Sources: Institute of Transportation Engineers, *Trip Generation, 5th ed.* ; University of California, San Francisco; National Park Service, *Fort Baker Final Environmental Impact Statement* , 1999; USAF Museum; National Child Care Information Center; Department of Social Services; Bay Area Economics, 2002.

Table 5.2-4: Employee Breakdown by Land Use

Occupations by Land Use	Distribution of Occupations in Industry Group (a)	Estimated Employment (b)	Number of Employees By Occupation
Office/HD R&D			
Managerial and Professional Specialty	44.6%	2,358	1,052
Technical, Sales, and Administrative Support	30.4%		717
Service	1.0%		24
Precision Production, Craft, and Repair	13.1%		309
Operators, Fabricators, and Laborers	10.9%		257
			2,358
LD R&D/Indust			
Managerial and Professional Specialty	44.6%	30	13
Technical, Sales, and Administrative Support	30.4%		9
Service	1.0%		0
Precision Production, Craft, and Repair	13.1%		4
Operators, Fabricators, and Laborers	10.9%		3
			30
University: Academic Uses			
Managerial and Professional Specialty	61.3%	3,667	2,248
Technical, Sales, and Administrative Support	29.3%		1,075
Service	5.8%		213
Groundskeepers and Gardeners	0.5%		18
Precision Production, Craft, and Repair	1.6%		59
Operators, Fabricators, and Laborers	1.5%		55
			3,667
University: Partner Uses (c)			
Managerial and Professional Specialty	44.6%	364	162
Technical, Sales, and Administrative Support	30.4%		111
Service	1.0%		4
Precision Production, Craft, and Repair	13.1%		48
Operators, Fabricators, and Laborers	10.9%		40
			364
Public/Museum			
Managerial and Professional Specialty	53.3%	115	61
Technical, Sales, and Administrative Support	30.2%		35
Service	9.5%		11
Groundskeepers and Gardeners	3.5%		4
Precision Production, Craft, and Repair	2.8%		3
Operators, Fabricators, and Laborers	0.7%		1
			115
Conference/Training			
Managerial and Professional Specialty	18.0%	250	45
Technical, Sales, and Administrative Support	18.1%		45
Service	56.5%		141
Groundskeepers and Gardeners	0.5%		1
Precision Production, Craft, and Repair	2.8%		7
Operators, Fabricators, and Laborers	4.1%		10
			250
Standard Retail			
Managerial and Professional Specialty	13.9%	150	21
Technical, Sales, and Administrative Support	29.5%		44
Service	50.7%		76
Groundskeepers and Gardeners	0.2%		0
Precision Production, Craft, and Repair	1.8%		3
Operators, Fabricators, and Laborers	3.9%		6
			150
Other Support Space (d)			
Managerial and Professional Specialty	13.9%	64	9
Technical, Sales, and Administrative Support	29.5%		19
Service	50.7%		33
Groundskeepers and Gardeners	0.2%		0
Precision Production, Craft, and Repair	1.8%		1
Operators, Fabricators, and Laborers	3.9%		3

			64
Recreation			
Managerial and Professional Specialty	13.9%	40	6
Technical, Sales, and Administrative Support	29.5%		12
Service	50.7%		20
Groundskeepers and Gardeners	0.2%		0
Precision Production, Craft, and Repair	1.8%		1
Operators, Fabricators, and Laborers	3.9%		2
			40
Support			
Managerial and Professional Specialty	45.0%	50	23
Technical, Sales, and Administrative Support	2.8%		1
Service	51.9%		26
Groundskeepers and Gardeners	0.1%		0
Operators, Fabricators, and Laborers	0.2%		0
			50

Notes:
(a) From Table 5.2-1.
(b) From Table 5.2-3.
(c) As in the EIS, analysis assumes that 25% of University Office space is dedicated to Partner uses.

(d) Assumes that employees in Other Support Space have identical occupational distribution as Standard Retail employees.

Sources: 1990 U.S. Census of Population, Public Use Microdata Samples; Bay Area Economics, 2002.

Table 5.2-5: Housing Need Projection

Occupations by Land Use	Number of Employees By Occupation (a)	% of Employees Renting & Living in Multifamily Unit (b)	Number of Employees Demanding Housing	Number of HH Demanding Housing (c)	Actual Units Demanded (d)
Office/HD R&D					
Managerial and Professional Specialty	1,052	21.9%	230	230	115
Technical, Sales, and Administrative Support	717	27.9%	200	200	100
Service	24	33.6%	8	8	4
Precision Production, Craft, and Repair	309	26.5%	82	82	41
Operators, Fabricators, and Laborers	257	29.0%	74	74	37
					297
LD R&D/Indust					
Managerial and Professional Specialty	13	21.9%	3	3	1
Technical, Sales, and Administrative Support	9	27.9%	3	3	1
Service	0	33.6%	0	0	0
Precision Production, Craft, and Repair	4	26.5%	1	1	1
Operators, Fabricators, and Laborers	3	29.0%	1	1	0
					4
University: Academic Uses					
Managerial and Professional Specialty	2,248	30.2%	679	679	339
Technical, Sales, and Administrative Support	1,075	33.4%	359	359	180
Service	213	33.6%	71	71	36
Groundskeepers and Gardeners	18	47.1%	9	9	4
Precision Production, Craft, and Repair	59	23.6%	14	14	7
Operators, Fabricators, and Laborers	55	18.6%	10	10	5
					571
University: Partner Uses					
Managerial and Professional Specialty	162	21.9%	36	36	18
Technical, Sales, and Administrative Support	111	27.9%	31	31	15
Service	4	33.6%	1	1	1
Precision Production, Craft, and Repair	48	26.5%	13	13	6
Operators, Fabricators, and Laborers	40	29.0%	11	11	6
					46
Public/Museum					
Managerial and Professional Specialty	61	42.2%	26	26	13
Technical, Sales, and Administrative Support	35	47.6%	17	17	8
Service	11	41.3%	5	5	2
Groundskeepers and Gardeners	4	27.7%	1	1	1
Precision Production, Craft, and Repair	3	0.0%	-	0	0
Operators, Fabricators, and Laborers	1	0.0%	-	0	0
					24

Conference/Training					
Managerial and Professional Specialty	45	38.0%	17	17	9
Technical, Sales, and Administrative Support	45	41.3%	19	19	9
Service	141	46.9%	66	66	33
Groundskeepers and Gardeners	1	24.9%	0	0	0
Precision Production, Craft, and Repair	7	28.8%	2	2	1
Operators, Fabricators, and Laborers	10	39.6%	4	4	2
					54
Standard Retail					
Managerial and Professional Specialty	21	30.2%	6	6	3
Technical, Sales, and Administrative Support	44	30.5%	13	13	7
Service	76	40.5%	31	31	15
Groundskeepers and Gardeners	0	40.2%	0	0	0
Precision Production, Craft, and Repair	3	38.4%	1	1	1
Operators, Fabricators, and Laborers	6	33.3%	2	2	1
					27
Other Support Space					
Managerial and Professional Specialty	9	30.2%	3	3	1
Technical, Sales, and Administrative Support	19	30.5%	6	6	3
Service	33	40.5%	13	13	7
Groundskeepers and Gardeners	0	40.2%	0	0	0
Precision Production, Craft, and Repair	1	38.4%	0	0	0
Operators, Fabricators, and Laborers	3	33.3%	1	1	0
					11
Recreation					
Managerial and Professional Specialty	6	30.2%	2	2	1
Technical, Sales, and Administrative Support	12	30.5%	4	4	2
Service	20	40.5%	8	8	4
Groundskeepers and Gardeners	0	40.2%	0	0	0
Precision Production, Craft, and Repair	1	38.4%	0	0	0
Operators, Fabricators, and Laborers	2	33.3%	1	1	0
					7
Support					
Managerial and Professional Specialty	23	26.6%	6	6	3
Technical, Sales, and Administrative Support	1	27.5%	0	0	0
Service	26	26.9%	7	7	3
Groundskeepers and Gardeners	0	100.0%	0	0	0
Operators, Fabricators, and Laborers	0	42.6%	0	0	0
					7
				Total Units Demanded	**1,048**

Notes:
(a) From Table 5.2-4.
(b) From Table 5.2-2.
(c) Number of Households = Number of Employees/Workers per Household.
Workers per Household: 1 per NASA policy requiring at least one NRP employee per unit.
(d) This analysis assumes that 50 percent of new employees currently renting multifamily units would choose to relocate to NRP housing. This assumption is based on results of a 1999 survey of Presidio Trust employees, where 57 percent of Trust employees who rent stated they would choose to relocate to the Presidio upon buildout. This analysis adopts a more

demand from *existing* employees, and only uses the Presidio Trust data as a guide in determining *new* employees' desire to relocate to ARC.

Sources: 1990 U.S. Census of Population, Public Use Microdata Samples; Presidio Trust; Bay Area Economics, 2002.

the Presidio would choose to relocate to new housing at the Presidio. To be conservative, this model only assumed 50 percent of households would choose to relocate to ARC.[1] This model is also conservative in that it only estimates housing demand generated by new NADP employees. Additional demand may also be generated by existing Ames Campus and Eastside/Airfield employees. In fact, the traffic impact analysis presented in Section 5.3 suggests that a portion of existing employees may relocate to on-site housing.

The 50 percent assumption is also justified by the fact that ARC housing would serve on-site employees' specific needs in terms of unit size and rent level. In contrast, the Presidio housing program was constrained by existing structures, and therefore had a limited range of unit types. Furthermore, the Presidio Trust adopted a more aggressive rent schedule than is proposed for ARC. Presidio survey respondents were aware of both these factors. While ARC lacks access to some neighborhood serving retail, such as a grocery store, it does offer a number of amenities including views of the Baylands, on-site child care, shuttle service to employment, and on-site recreational and educational facilities, all of which would support a 50 percent relocation assumption.

— **Step 7: Determine Affordable Rents.** To calculate affordable rents, BAE assumed that households would not spend more than 35 percent of gross household income on housing costs (excluding utilities). Traditional affordable housing demand analyses frequently use a 30 percent income-to-rent ratio, but BAE has employed private sector tenant screening criteria for this analysis. These private sector standards range from 35 to 40 percent of gross income to rent. This analysis is presented in Table 5.2-6, and the complete model results are summarized in Table 5.2-7. Note that rent levels will be adjusted as necessary to reflect market

[1] Although the Presidio Trust data applies to existing employees' desire to relocate to on-site housing, it is used here as a guide in determining new NADP employees' willingness to reside at ARC. As stated above, this housing demand analysis does not account for demand from existing ARC employees.

conditions upon buildout and on-site employee needs. The rents shown in the housing model and discussed here should be considered preliminary estimates.

2. Model Results

Based upon the methodology and assumptions of the ARC housing demand model, BAE obtained the following results:

- For planning purposes, there is support for approximately 1,048 multifamily units targeted to NRP employee households. Additional units may be demanded by existing Ames Campus and Eastside/Airfield employees.
- Mitigated Alternative 5 plans the development of 1,120 units at Bay View. These units would house approximately 15 percent of total new employee households generated by Mitigated Alternative 5, assuming one employee per household.
- Approximately 25 percent of total demand would be for higher-end apartments or moderately priced townhomes (i.e. monthly rents from$2,000 to $2,400), assuming no more than 35 percent of an employee household's gross income is spent on housing. This percentage translates into approximately 270 units. The conceptual land use plan in Chapter 5.1 includes 250 units of this type, which would be supportable according to these calculations.
- Using the same income-to-rent ratio, approximately 13 percent of units, or 134 of the total proposed units under Mitigation Measure SOCIO 1-b, would be priced within $1,600 and $2,000 per month.
- Using the same income-to-rent ratio, over 57 percent of demand by employee households would be for units priced between $1,400 and $1,600 per month. This translates into approximately 602 of the 1,050 units that could be supported.

Table 5.2-6: Housing Price and Affordability

Occupations by Land Use	Inflated 2002 Median Household Income (a)	Affordable Gross Monthly Rent (b)	Actual Units Demanded (c)
Office/HD R&D			
Managerial and Professional Specialty	$88,500	$2,581	115
Technical, Sales, and Administrative Support	$72,747	$2,122	100
Service	$61,065	$1,781	4
Precision Production, Craft, and Repair	$67,260	$1,962	41
Operators, Fabricators, and Laborers	$60,180	$1,755	37
LD R&D/Indust			
Managerial and Professional Specialty	$88,500	$2,581	1
Technical, Sales, and Administrative Support	$72,747	$2,122	1
Service	$61,065	$1,781	0
Precision Production, Craft, and Repair	$67,260	$1,962	1
Operators, Fabricators, and Laborers	$60,180	$1,755	0
University: Academic Uses			
Managerial and Professional Specialty	$54,247	$1,582	339
Technical, Sales, and Administrative Support	$51,242	$1,495	180
Service	$52,633	$1,535	36
Groundskeepers and Gardeners	$65,490	$1,910	4
Precision Production, Craft, and Repair	$74,163	$2,163	7
Operators, Fabricators, and Laborers	$34,657	$1,011	5
University: Partner Uses (c)			
Managerial and Professional Specialty	$88,500	$2,581	18
Technical, Sales, and Administrative Support	$72,747	$2,122	15
Service	$61,065	$1,781	1
Precision Production, Craft, and Repair	$67,260	$1,962	6
Operators, Fabricators, and Laborers	$60,180	$1,755	6
Public/Museum			
Managerial and Professional Specialty	$58,941	$1,719	13
Technical, Sales, and Administrative Support	$45,377	$1,324	8
Service	$33,984	$991	2
Groundskeepers and Gardeners	$35,754	$1,043	1
Precision Production, Craft, and Repair	NA	NA	0
Operators, Fabricators, and Laborers	NA	NA	0
Conference/Training			
Managerial and Professional Specialty	$68,572	$2,000	9
Technical, Sales, and Administrative Support	$60,180	$1,755	9
Service	$50,468	$1,472	33
Groundskeepers and Gardeners	$52,640	$1,535	0
Precision Production, Craft, and Repair	$68,322	$1,993	1
Operators, Fabricators, and Laborers	$58,314	$1,701	2
Standard Retail			
Managerial and Professional Specialty	$63,685	$1,857	3
Technical, Sales, and Administrative Support	$50,976	$1,487	7
Service	$47,790	$1,394	15
Groundskeepers and Gardeners	$63,720	$1,859	0
Precision Production, Craft, and Repair	$49,560	$1,446	1
Operators, Fabricators, and Laborers	$52,323	$1,526	1

Other Support Space			
Managerial and Professional Specialty	$63,685	$1,857	1
Technical, Sales, and Administrative Support	$50,976	$1,487	3
Service	$47,790	$1,394	7
Groundskeepers and Gardeners	$63,720	$1,859	0
Precision Production, Craft, and Repair	$49,560	$1,446	0
Operators, Fabricators, and Laborers	$52,323	$1,526	0
Recreation			
Managerial and Professional Specialty	$63,685	$1,857	1
Technical, Sales, and Administrative Support	$50,976	$1,487	2
Service	$47,790	$1,394	4
Groundskeepers and Gardeners	$63,720	$1,859	0
Precision Production, Craft, and Repair	$49,560	$1,446	0
Operators, Fabricators, and Laborers	$52,323	$1,526	0
Support			
Managerial and Professional Specialty	$55,622	$1,622	3
Technical, Sales, and Administrative Support	$63,653	$1,857	0
Service	$36,993	$1,079	3
Groundskeepers and Gardeners	$65,490	$1,910	0
Operators, Fabricators, and Laborers	$47,694	$1,391	0

Notes:
(a) From Table 5.2-2.
(b) Affordable gross monthly rent is considered to be 35% of household income, inclusive of utilities.
(c) From Table 5.2-5.

Sources: 1990 U.S. Census of Population, Public Use Microdata Samples; Bay Area Economics, 2002.

Table 5.2-7: Housing Demand Summary

Affordable Gross Monthly Rent Range (a)	Number of Units Demanded (b)	Percent of Total
$2,200 to $2,400	134	12.8%
$2,000 to $2,200	132	12.6%
$1,800 to $2,000	59	5.6%
$1,600 to $1,800	75	7.2%
$1,400 to $1,600	602	57.4%
$1,000 to $1,400	44	4.2%
$800 to $1,000	2	0.2%
Total	**1,048**	**100.0%**
Median Gross Monthly Rent	**$1,755**	
Average Gross Monthly Rent	**$1,711**	

Notes:
(a) Ranges from Table 5.2-6.
(b) Units summed from Table 5.2-6.

Sources: Bay Area Economics, 2002.

— At least 10 percent of total units would be priced below $1,400 per month to ensure that employees in lower paying occupations have an opportunity to be housed on-site. This percent is approximately the same as would typically be found in surrounding communities. Mitigation Measure SOCIO-1d states that NASA would ensure that at least 10 percent of on-site housing is affordable to low income households.

  NASA may have to explore discounted rents to accommodate employee households at this lower end of the affordable rent range. The degree of rent discounts will depend on construction costs, cost of financing, and the overall market rents at the time of project development. BAE recommends further analysis of this program option once more information is available from NASA's ARC planning partners.

3. Market Rate Rents and Unit Sizes

The housing demand model predicts that rents that would be affordable to NRP employee households are slightly higher than average rents reported for Mountain View. The projected average monthly rent for ARC housing units is $1,711, compared to an average rent of $1,555 for Mountain View apartments in the fourth quarter of 2001. However, the higher rents for on-site housing would be justified by the fact that units would be larger on the average at ARC. NASA is assuming an average unit size of 1,300 square feet for townhomes and 1,000 for apartments, with two to three bedrooms per unit. In comparison, the average two to three-bedroom unit in the City of Mountain View is approximately 1,004 square feet.

Table 5.2-8 contains these data. Rent and unit size data for the City of Mountain View were obtained from RealFacts, a commercial data vendor.

4. Marketability of Proposed Housing

In response to the NADP Draft Environmental Impact Statement, commentors expressed concern over the marketability of high-density housing such as that proposed for the Bay View area. Housing at Bay View is expected to be 48 units per gross acre. BAE researched projects currently under

development in Sunnyvale and Mountain View to demonstrate the private sector's willingness to provide high-density housing and show that high-density housing at Bay View would have market support. In Sunnyvale a 124-unit apartment complex has been approved at 395 East Evelyn Avenue, at 41 units to the acre. Another approved project at 321 East Washington Avenue has densities of 48 units to the acre. In Mountain View, a 211-unit residential project at 2400 El Camino Real has 48 units to the acre. Absorption of these units depends largely on regional real estate market cycles. However, local developers report that Silicon Valley apartment developers are increasingly developing high-density projects due to high land values and successful marketing of this product type. One developer described high-density housing as "very marketable" and noted that some developers have built up to eight-story apartment projects in Silicon Valley.[2]

In addition, a residential project at Bay View would have the market advantage of views of the bay lands, proximity and shuttle service to employment at ARC, access to on-site child care, and on-site recreational and educational facilities.

B. Demand for Student Housing

The housing foreseen under Mitigation Measure SOCIO-1 and outlined in Section 5.1 would include 810 student apartments and dormitories. Assuming two persons per unit, approximately 1,560 students could be accommodated in the ARC. This section considers whether there would be adequate demand for this student housing.

NASA's university partners (University of California, San Jose State University and Carnegie Mellon University) have submitted program plans to NASA indicating a total of approximately 3,000 undergraduate, graduate,

[2]Interview with Miles Huber, Archstone Communities, 4/29/02.

continuing education and extension students that would be accommodated under ARC development. This identified pool of students represents the total universe of demand for student housing at ARC.

The proposed housing supply for 1,560 students would house 52 percent of the projected student population of approximately 3,000 students. As a benchmark, the University of California at Merced campus, currently under development, expects to house 50 percent of its student population on campus. Stanford University houses approximately 100 percent of its undergraduate population and 52 percent of its graduate student population. These figures suggests that the NRP plans for student housing reflect an adequate and reasonable estimation of demand. The historically high cost of housing in Santa Clara County also suggests a strong demand for on site student housing.

Table 5.2-8: Overview of Mountain View Apartment Market

CURRENT MARKET DATA

Unit Type	Number	Percent of Total	Avg. Sq. Ft.	Avg. Rent (a)	Avg. Rent/Sq. Ft.
0/1	861	11.40%	504	$1,343	$2.67
1 BR/1 BA	3,445	45.50%	698	$1,406	$2.01
2 BR/1 BA	1,140	15.10%	892	$1,519	$1.70
2 BR/2 BA	1,462	19.30%	1,023	$1,858	$1.82
2 BR Twnhse	214	2.80%	1,074	$1,808	$1.68
3 BR/2 BA	424	5.60%	1,191	$2,070	$1.74
3 BR Twnhse	26	30.00%	1,300	$2,400	$1.85
Totals	7,572	100.0%	808	$1,555	$1.92

RENT TRENDS

	Quarterly Rent Trend		Annual Rent Trend
2000Q1	$1,536	**1994**	$898
2000Q2	$1,790	**1995**	$945
2000Q3	$1,997	**1996**	$1,107
2000Q4	$2,052	**1997**	$1,259
2001Q1	$2,066	**1998**	$1,389
2001Q2	$1,862	**1999**	$1,453
2001Q3	$1,757	**2000**	$1,837
2001Q4	$1,555	**2001**	$1,810
4 Period +/-	-24.2%		43.8%

VACANCY TRENDS

	Vacancy Rate
1994	4.1%
1995	1.2%
1996	2.1%
1997	2.8%
1998	4.2%
1999	3.1%
2000	1.1%
2001	7.1%

Notes:
(a) Rents as of 4Q 2001.

Sources: RealFacts, Inc.; Bay Area Economics, 2002.

5.3 TRAFFIC AND CIRCULATION

This chapter describes the traffic analysis that was completed to determine whether or not secondary impacts would occur with the provision of additional dwelling units under Mitigation Measure SOCIO-1b. The results are presented in the same outline form included in Section 4.3 of this EIS to illustrate the effects of the additional mitigation measure (heretofore referred to as Mitigated Alternative 5).

A. Impact Discussion

1. Effects on Roadways

a. Trip Generation

The trip generation under the Mitigated Alternative 5 would be the same as Alternative 5 without mitigation with four exceptions:

- 810 student apartment and dormitory units would be provided in the NRP area, instead of 290 under Alternative 5.
- 4,459 square meters (48,000 square feet) of office would removed from the NRP area (Historic District) to accommodate new dormitory units.
- 1,120 townhome and apartment units would be provided in Bay View instead of 750 included under Alternative 5.
- There would be 750 new NASA employees associated with the Ames Research Center. This number is the same as in the DPEIS, but the traffic analysis for the DPEIS mistakenly assumed 1,300 new ARC employees under Alternative 5.

The detailed daily and peak hour trip generation estimates for an average weekday are presented in Table 5.3-1, and daily estimates for both weekend days are shown in Table 5.3-2. The same housing and TDM percent reductions were applied to estimate the number of daily, AM peak and PM peak hour trips generated by Mitigated Alternative 5 as by Alternative 5 in the DPEIS. The additional dwelling units are expected to reduce overall trip generation to Moffett Field by providing housing for both project-generated

employees/students and existing employees at the NASA Ames Research Center.

Trip generation summaries are presented in Tables 5.3-3 and 5.3-4. Table 5.3-3 is in the same format as Tables 4.3-2 through 4.3-5 included in Volume II of the EIS. Mitigated Alternative 5 is expected to generate a total of 14,880 net new daily trips, 430 net new AM peak hour trips, and 785 net new PM peak hour trips. The TDM and housing reductions are applied to all uses with the western Moffett Field area including baseline uses, which results in the negative trip generation shown for inbound AM peak hour trips. Projected weekend trip generation under Mitigated Alternative 5 is 19,055 net new Saturday daily trips and 17,339 net new Sunday trips. These volumes are approximately 30 percent higher than the corresponding numbers for Alternative 5 described in the DPEIS. Table 5.3-5 below illustrates the comparison of each alternative.

Mitigated Alternative 5 would result in a significant trip reduction since it would internalize many trips within Moffett Field. The calculated trip reduction for average weekdays is 39 percent for daily trips and nearly 81 percent and 76 percent during the AM and PM peak hours, respectively. Table 5.3-6 (in the format of Table 2-4 from the DPEIS) compares the trip reduction due to both TDM and housing for each alternative.

b. Trip Distribution and Assignment

Trip distribution and assignment would be the same as presented in the Draft EIS.

c. Impact on Intersection Operations

Several intersections are projected to operate at less than acceptable levels even with the traffic reductions that are projected to occur under Mitigated Alternative 5. However, additional dwelling units would reduce the number of external peak hour trips generated outside Moffett Field and are expected to reduce intersection impacts. The only intersection to be significantly impacted even with the additional housing mitigation is the Moffett Boulevard-Clark

Table 5.3-1: Estimated Weekday Trip Generation for NASA Re-use Development
April 11, 2002
Alternative #5 w/ Additional Housing

				Rates							Trips						
					AM			PM				AM			PM		
Zone	Use	Size	Units	Daily	In	Out	Total	In	Out	Total	Daily	In	Out	Total	In	Out	Total
1 & 2	Apartment-Style Housing/Dorms	810	d u.	9 66	0 20	1 08	1.28	1 01	0 50	1.50	7,825	166	871	1,037	814	401	1,215
	n/a																
3	Low Density R & D	90	ksf	9 02	1 03	0 21	1.24	0.18	1 00	1.18	812	93	19	112	16	90	106
	Removal of Room 583 Motel Rooms	168	rooms	-10.43	-0 23	-0.41	-0.64	-0 31	-0 27	-0.58	-1,314	-35	-62	-97	-47	-41	-88
4	High Density R & D	29	ksf	7.13	0 95	0.13	1.08	0 20	0 98	1.18	207	28	4	31	6	28	34
5 & 8	High Density R&D (Univ.)	406	ksf	7.13	0 95	0.13	1.08	0 20	0 98	1.18	2,895	387	53	440	81	396	477
	University Classrooms	662	students	2 38	0.17	0 04	0.21	0 06	0.15	0.21	1,576	111	28	139	42	97	139
	High Density R&D (e/o Cody)	195	ksf	7.13	0 95	0.13	1.08	0 20	0 98	1.18	1,391	186	25	211	39	190	229
6	High Density R & D (LMartin)	600	ksf	7.13	0 95	0.13	1.08	0 20	0 98	1.18	4,279	572	78	650	120	585	705
7	Computer Museum	120	ksf	7 00	0.41	0 05	0.46	0 09	1 07	1.16	840	50	6	55	11	128	139
9	High Density R & D	0	ksf	7.13	0 95	0.13	1.08	0 20	0 98	1.18	0	0	0	0	0	0	0
10	High Density R & D	0	ksf	7.13	0 95	0.13	1.08	0 20	0 98	1.18	0	0	0	0	0	0	0
11	High Density R & D	0	ksf	7.13	0 95	0.13	1.08	0 20	0 98	1.18	0	0	0	0	0	0	0
12	n/a																
	n/a																
	n/a																
	n/a																
	Townhouse-Style Units	1120	d u.	9 66	0.18	0 97	1.15	0 90	0.45	1.35	10,819	206	1,082	1,288	1,013	499	1,512
13	Regional Fire Facility	0	ksf	4 22	0 60	0.11	0.70	0.11	0 60	0.70	0	0	0	0	0	0	0
	Regional Fire Facility	0	rooms	2 38	0.17	0 04	0.21	0 06	0.15	0.21	0	0	0	0	0	0	0
	n/a																
	n/a																
	Warehouse	0	ksf	4.12	0 37	0 08	0.45	0.11	0 34	0.44	0	0	0	0	0	0	0
14	CMU, UCSC, ATCC, Other Shen Us	113	ksf	9 02	1 03	0 21	1.24	0.18	1 00	1.18	1,020	117	24	141	20	114	134
	Ames Child Care	14	emp	5 36	0 51	0 06	0.57	0 06	0 51	0.57	75	7	1	8	1	7	8
	Removal of Office Use	48	ksf	9 02	1 03	0 21	1.24	0.18	1 00	1.18	-528	-66	-9	-75	-12	-60	-72
15	Conference/Training Rooms	250	rooms	9 38	0 51	0 38	0.89	0.46	0.48	0.94	2,345	130	94	224	115	120	235
16	Historic Infill (HD R&D)	155	ksf	7.13	0 95	0.13	1.08	0 20	0 98	1.18	1,105	148	20	168	31	151	182
17	Museum	500	ksf	6.11	0.41	0 05	0.45	0 09	1 02	1.11	3,055	203	23	225	44	511	555
18	Space Camp (HD R&D)	70	ksf	6.11	0.41	0 05	0.45	0 09	1 02	1.11	428	28	3	32	6	71	78
19	ARC (LD R&D)	290	ksf	8.47	0 99	0 20	1.19	0.17	0 95	1.11	2,458	287	59	345	78	274	323
TDM Trip Reduction:																	
										Bay View Total (Zone 12)	*10,819*	*206*	*1,082*	*1,288*	*1,013*	*499*	*1,512*
										On-site Housing Trip Reduction	*-3,787*	*-150*	*-787*	*-937*	*-736*	*-363*	*-1,099*
	All areas but East Airfield	22.0%								*TDM Trip Reduction*	*-1,547*	*-12*	*-65*	*-77*	*-61*	*-30*	*-91*
	East Airfield only	6%								***Net Bayview Trips***	***5,485***	***44***	***230***	***274***	***216***	***106***	***322***
										Eastside/Airfield Total (Zone 13)	*0*	*0*	*0*	*0*	*0*	*0*	*0*
										On-site Housing Trip Reduction	*0*	*0*	*0*	*0*	*0*	*0*	*0*
										TDM Trip Reduction	*0*	*0*	*0*	*0*	*0*	*0*	*0*
										Net East Side Airfield Trips	***0***	***0***	***0***	***0***	***0***	***0***	***0***
										Ames Campus Total (Zone 19)	*2,458*	*287*	*59*	*345*	*78*	*274*	*323*
										On-site Housing Trip Reduction	*-777*	*-161*	*-31*	*-192*	*-74*	*-151*	*-225*
										TDM Trip Reduction	*-370*	*-28*	*-6*	*-34*	*-1*	*-27*	*-21*
										Net Ames Campus Trips	***1,311***	***98***	***22***	***119***	***3***	***96***	***76***
										NRP/ARC Total (Zones 1-11,14-19)	*26,010*	*2,123*	*1,177*	*3,300*	*1,287*	*2,790*	*4,077*
										On-site Housing Trip Reduction	*-8,487*	*-1,303*	*-797*	*-2,100*	*-1,083*	*-1,380*	*-2,463*
										TDM Trip Reduction	*-3,855*	*-180*	*-84*	*-264*	*-45*	*-310*	*-355*
										Net NRP/ARC Trips	***13,668***	***640***	***296***	***936***	***159***	***1,099***	***1,258***
										Total Gross Trips	*39,287*	*2,616*	*2,317*	*4,933*	*2,378*	*3,563*	*5,911*
										Total Net Trips	**20,464**	**781**	**548**	**1,329**	**378**	**1,302**	**1,656**

Note: The number of conference rooms was estimated based on the square footage for Alternative 5 and compared to the numbers for the other alternatives. Since the trip generation rate for this use was not based on any standard rate, the estimate should be considered conservative.

Table 5.3-2: Estimated Weekend Trip Generation for NASA Re-use Development

April 11, 2002

Alternative #5 w Additional Housing

				Rates		Trips	
Zone	Use	Size	Units	Saturday	Sunday	Saturday	Sunday
1 & 2	Apartment-Style Housing	810	d.u.	6.39	5.86	5,176	4,747
	n/a						
3	Low Density R & D	90	ksf	1.90	1.11	171	100
	Removal of Room 583 Motel Rooms	168	rooms	-8.84	-7.39	-1,114	-931
4	High Density R & D	29	ksf	2.37	0.98	69	28
5 & 8	High Density R&D (Univ.)	406	ksf	2.37	0.98	962	398
	University Classrooms	662	students	1.30	1.30	861	861
	High Density R&D (e/o Cody)	195	ksf	2.37	0.98	462	191
6	High Density R & D (LMartin)	600	ksf	2.37	0.98	1,422	588
7	Computer Museum	120	ksf	10.36	10.36	1,243	1,243
9	n/a						
10	n/a						
11	n/a						
12	n/a						
	n/a						
	n/a						
	n/a						
	Townhouse-Style Units	1120	d.u.	6.39	5.86	7,157	6,563
13	Regional Fire Facility	0	ksf	2.11	2.11	0	0
	Regional Fire Facility	0	rooms	2.38	2.38	0	0
	n/a						
	n/a						
	Warehouse	0	ksf	1.22	0.79	0	0
14	CMU, UCSC, ATCC, Other Shen Us	113	ksf	1.90	1.11	215	125
	Ames Child Care	14	emp	0.00	0.00	0	0
	Removal of Office Use	48	ksf	1.90	1.11	-91	-53
15	Conference/Training Rooms	250	rooms	2.35	2.35	588	588
16	Historic Infill (HD R&D)	155	ksf	2.37	0.98	367	152
17	Museum	500	ksf	8.93	8.93	4,465	4,465
18	Space Camp (HD R&D)	70	ksf	2.37	0.98	166	69
19	ARC (LD R&D)	290	ksf	1.90	1.11	551	322
TDM Trip Reduction:				*Bay View Total (Zone 12)*		*7,157*	*6,563*
				On-site Housing Trip Reduction		*-716*	*-656*
	All Areas but East Airfield			*TDM Trip Reduction*		*-386*	*-354*
	6.0%			***Net Bayview Trips***		***6,055***	***5,552***
	East Airfield			*Eastside/Airfield Total (Zone 13)*		*0*	*0*
	2.0%			*On-site Housing Trip Reduction*		*0*	*0*
				TDM Trip Reduction		*0*	*0*
				Net East Side Airfield Trips		***0***	***0***
				Ames Campus Total (Zone 19)		*551*	*322*
				On-site Housing Trip Reduction		*0*	*0*
				TDM Trip Reduction		*-33*	*-19*
				Net Ames Campus Trips		***518***	***303***
				NRP/ARC Total (Zones 1-11,14-19)		*14,520*	*12,568*
				On-site Housing Trip Reduction		*-518*	*-475*
				TDM Trip Reduction		*-840*	*-726*
				Net NRP/ARC Trips		*13,163*	*11,368*
				Total Gross Trips		*22,228*	*19,454*
				Total Net Trips		**19,735**	**17,223**

Table 5.3-3 AM/PM Trip Generation Summary - Alternative 5 w/ Additional Housing

		Weekday Trips					
		AM			PM		
	Daily	In	Out	Total	In	Out	Total
Bay View Total	10,819	206	1,082	1,288	1,013	499	1,512
On-site Housing Reduction	-3,787	-150	-787	-937	-736	-363	-1,099
TDM Trip Reductions	-1,547	-12	-65	-77	-61	-30	-91
Net Bayview Trips	5,485	44	230	274	216	106	322
East Side Airfield Total	0	0	0	0	0	0	0
On-site Housing Reduction	0	0	0	0	0	0	0
TDM Trip Reductions	0	0	0	0	0	0	0
Net Eastside/Airfield Trips	0	0	0	0	0	0	0
Ames Campus Total	2,458	287	59	345	78	274	323
On-site Housing Reduction	-777	-161	-31	-192	-74	-151	-225
TDM Trip Reductions	-286	-21	-5	-26	-4	-21	-25
Net Ames Campus Trips	1,311	98	22	119	3	96	76
NRP Total	20,163	1,257	1,102	2,359	1,169	1,995	3,165
On-site Housing Reduction	-8,487	-1,303	-797	-2,100	-1,083	-1,380	-2,463
TDM Trip Reductions	-3,592	-141	-80	-222	-40	-274	-314
Net NRP Trips	8,084	-188	225	37	47	341	387
Total Net Trips	**14,880**	**-46**	**476**	**430**	**266**	**543**	**785**

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TABLE 5.3-4 **WEEKEND TRIP GENERATION SUMMARY - ALTERNATIVE 5 WITH ADDITIONAL HOUSING**

	Daily Trips	
	Saturday	**Sunday**
Bay View Total	7,157	6,563
On-site Housing Reduction	-716	-656
TDM Trip Reductions	-386	-354
Net Bayview Trips	6,055	5,552
East Side Airfield Total	0	0
On-site Housing Reduction	0	0
TDM Trip Reductions	0	0
Net Eastside/Airfield Trips	0	0
Ames Campus Total	551	322
On-site Housing Reduction	0	0
TDM Trip Reductions	-33	-19
Net Ames Campus Trips	518	303
NRP Total	13,826	12,686
On-site Housing Reduction	-518	-475
TDM Trip Reductions	-826	-728
Net NRP Trips	12,483	11,484
Total Net Trips	**19,055**	**17,339**

TABLE 5.3-5 **COMPARISON OF PROJECT TRIP GENERATION - ALL ALTERNATIVES**

	Total Net New Trips						
		AM			PM		
	Daily	In	Out	Total	In	Out	Total
Alternative 1 (No Project)	5,584	827	72	899	112	759	871
Alternative 2	22,455	1,521	464	1,986	485	1,803	2,289
Alternative 3	15,895	1,255	365	1,622	517	1,725	2,183
Alternative 4	27,580	2,105	592	2,696	624	2,456	3,079
Alternative 5	14,366	611	402	1,012	313	1,093	1,407
Mitigated Alternative 5	14,880	-46	476	430	266	543	785

Memorial Drive/R.T. Jones Road intersection. A summary of the LOS analyses is presented in Table 5.3-7.

d. Effect of Charleston Avenue Bridge

The bridge is still not required to mitigate any project intersection impacts. The smaller amount of external traffic generated by additional on-site dwelling units would further lessen the need for the bridge. Increased trip internalization due to the additional housing would provide additional capacity on Moffett Boulevard for other trips (e.g., to and from North of Bayshore area) if the bridge were constructed. Construction of additional housing would not preclude construction of the bridge.

TABLE 5.3-6: **TDM AND HOUSING TRIP REDUCTIONS**

Daily Trips	Westside		Eastside/Airfield	
	TDM	Housing	TDM	Housing
Alternative 1	4.5%	N/A	N/A	N/A
Alternative 2	22.3%	17.3%	5.5%	7.7%
Alternative 3	23.6%	14.6%	5.6%	6.5%
Alternative 4	21.5%	17.1%	5.5%	8.1%
Alternative 5	20.0%	26.3%	N/A	N/A
Mitigated Alternative 5	16.5%	39.0%	N/A	N/A
AM Peak Hour				
Alternative 1	4.5%	N/A	N/A	N/A
Alternative 2	20.0%	32.8%	4.7%	22.2%
Alternative 3	21.9%	28.2%	5.1%	14.6%
Alternative 4	19.3%	30.5%	4.8%	20.7%
Alternative 5	15.6%	52.7%	N/A	N/A
Mitigated Alternative 5	8.4%	80.9%	N/A	N/A
PM Peak Hour				
Alternative 1	4.5%	N/A	N/A	N/A
Alternative 2	19.2%	32.2%	4.4%	26.6%
Alternative 3	21.0%	25.1%	5.0%	17.3%
Alternative 4	18.6%	30.2%	4.5%	24.9%
Alternative 5	15.1%	49.5%	N/A	N/A
Mitigated Alternative 5	8.5%	75.7%	N/A	N/A

Notes: The highlighted portions of this table represent a revision of DPEIS Table 2-4.
N/A = Not applicable because the indicated use would not be built.
Percentages represent the proportion compared to gross trip generation.
The variation in the net TDM reduction is caused by the fact that the housing reduction is taken first. The housing reduction varies because the amount and type of housing varies among alternatives. Next, a TDM reduction of 22 percent is applied to the net external trips (gross trips less the housing reduction). Thus, the higher the housing-related reduction, the lower the TDM percentage.
Source: Fehr and Peers Associates.

TABLE 5.3-7 YEAR 2013 CUMULATIVE CONDITIONS WITH AND WITHOUT THE MITIGATED ALTERNATIVE 5

		Year 2013 Cumulative Without Alternative 5		Year 2013 Cumulative Plus Alternative 5 w/ Additional Housing		
Intersection	Peak Hour	Delay (sec)[1]	LOS[2]	Delay (sec)	LOS	Change in Delay[3]
Middlefield Road/	AM	*48.5*	*E*	48.5	E	+0.0
Shoreline Boulevard	PM	*48.5*	*E*	48.6	E	+0.0
Moffett Boulevard/	AM	48.0	E	49.1	E	+1.0
Central Expressway	PM	53.4	E	56.7	E-	+3.2
Moffett Boulevard/	AM	36.1	D	36.8	D	+1.0
Middlefield Road	PM	36.1	D	38.2	D-	+3.0
Moffett Boulevard/	AM	11.3	B	11.5	B	+0.2
SR 85 NB Ramp	PM	5.6	B+	5.9	B+	-0.1
Moffett Boulevard/	AM	10.3	B	10.5	B	+2.1
US 101 SB Ramps	PM	12.1	B	15.1	C+	+6.0
Moffett Boulevard/	AM	10.6	B	10.1	B	+1.5
US 101 NB Ramps	PM	11.2	B	11.7	B	-5.1
Moffett Blvd. (Clark	AM	*63.8*	*F*	**73.4**	**F**	**+9.5**
Road)/R.T. Jones Road	PM	*196.6*	*F*	**295.5**	**F**	**+99.1**
Whisman Road/	AM	13.6	B-	13.6	B-	-0.1
Middlefield Road	PM	15.1	C+	15.2	C+	-6.6
Ellis Street/	AM	21.6	C	22.0	C	+0.7
Middlefield Road	PM	17.2	C	17.8	C	+0.8
Ellis Street/	AM	21.3	C	23.4	C-	+1.2
US 101 SB Ramps	PM	16.8	C+	18.0	C	+1.4
Ellis Street/	AM	18.2	C	18.3	C	-0.1
US 101 NB Ramps	PM	11.8	B	12.1	B	+0.2
Ellis Street/	AM	10.8	B	10.9	B	+0.1
Manila Drive	PM	20.5	C	24.4	C	+4.0
Middlefield Road/	AM	15.3	C+	15.3	C+	-0.1
SR 237 WB Ramps	PM	19.4	C	19.9	C	+1.6
Middlefield Road/	AM	19.3	C	19.1	C	+0.0
SR 237 EB Ramps	PM	12.7	B	12.6	B	- 0.1
Manila Drive/	AM	7.1	B	7.1	B	0.0
H Street	PM	11.0	B	11.0	B	0.0
Mathilda Avenue/	AM	*100.5*	*F*	101.9	F	+1.5
SR 237 EB Ramps	PM	17.3	C	17.4	C	+0.0
Mathilda Avenue/	AM	*284.6*	*F*	283.6	F	-1.0
SR 237 WB Ramps	PM	*> 360*	*F*	> 360	F	+167.5
Manila Drive (Moffett Park	AM	*> 360*	*F*	> 360	F	0.0
Ext.)/Mathilda Avenue	PM	*339.3*	*F*	344.3	F	+5.7
Central Expressway/	AM	*67.2*	*F*	66.9	F	-0.3
Mary Avenue	PM	52.2	E	55.0	E	+7.8

Note: Unacceptable operations without the project are shown in italics, while significant impacts are highlighted in bold and highlighted text.

[1] Whole intersection weighted average stopped delay expressed in seconds per vehicle (sec/veh) for signalized intersections, and total control delay in sec/veh for unsignalized intersections.
[2] LOS calculations for signalized intersections performed using the 1985 *Highway Capacity Manual* methodology contained in the TRAFFIX software package with adjusted saturation flow rates to reflect local conditions.
[3] LOS calculations for unsignalized intersections performed using the 1997 *Highway Capacity Manual* methodology contained in the TRAFFIX software package.
[4] Change in average critical delay between Background and Project Conditions.
[5] Change in critical volume/capacity (V/C).

e. Effects on Freeways

The methodology used in the DPEIS was used to determine the effect of Mitigated Alternative 5 on freeway operations. The addition of housing units and the reduced number of external vehicle trips would lessen project impacts.

However, significant impacts are still projected to occur on all segments of Highway 101, SR 85, and SR 237 near the site in at least one direction during the AM and /or PM peak hour. Under Mitigated Alternative 5, project trips would add between at least one percent and 3.5 percent of capacity on all nearby segments, as shown on Table 5.3-8. Alternative 5 in the DEIS was expected to result in increases of up to eight percent on some segments near the site.

A substantial benefit of the addition of more housing would be a reduction in the number of significantly impacted external study freeway segments from nine (under Alternative 5 in the DPEIS) to three, as shown in Table 5.3-9. These results compare favorably to the 16 or more significantly impacted segments under Alternatives 2, 3 and 4.

f. Construction Traffic Impacts

Expected to be the same for all build alternatives requiring fill in Bay View.

2. Effects on Public Transit

The additional on-site housing could reduce the demand for transit service, especially during the peak hour, since on-site residents could travel to and from on-site employment by using shuttles and bicycles or by walking. Overall, fewer trips from external locations would be made, which is illustrated by a lower TDM reduction for Alternative 5 with additional housing. The increased number of working spouses in the additional dwelling units would also generate transit demand, but this demand is expected to be less than the number of external trips reduced. It is important to note that transit demand would likely be higher on weekends, since there would be substantially more

Table 5.3-8
Freeway Segment Analysis-Alternative 5 w/ Additional Housing (Nearby Locations)

				Year 2013 Baseline[1]						2013 Project Alt. 5 w Add'l Housing				
Freeway	Segment	Direction	Peak Hour	Lanes	Volume	Average Speed	Density	LOS[2]		Project Trips	Volume	Density	LOS[2]	% Impact
US 101	Moffett to SR 85	NB	AM	3	4,235	15	94 1	F		66	4,302	**95.6**	**F**	**0.96**
US 101	Moffett to SR 85	NB	PM	3	4,945	15	109 9	F		143	5,088	**113.1**	**F**	**2.08**
US 101	Moffett to SR 85	SB	AM	3	7,473	50	49 8	E		92	7,565	50 4	E	1 33
US 101	Moffett to SR 85	SB	PM	3	6,353	55	38 5	D		52	6,405	38 8	D	0 75
US 101	Moffett to SR 85	NB HOV	AM	1	1,433	15	95 5	F		23	1,456	**97.0**	**F**	**1.25**
US 101	Moffett to SR 85	NB HOV	PM	1	2,130	40	53 3	E		62	2,192	**54.8**	**E**	**3.43**
US 101	Moffett to SR 85	SB HOV	AM	1	1,950	60	32 5	D		24	1,974	32 9	D	1 33
US 101	Moffett to SR 85	SB HOV	PM	1	1,540	60	25 7	D		12	1,553	25 9	D	0 69
US 101	SR 237 to Moffett	NB	AM	3	4,483	15	99 6	F		213	4,695	**104.3**	**F**	**3.08**
US 101	SR 237 to Moffett	NB	PM	3	4,837	25	64 5	F		122	4,959	**66.1**	**F**	**1.76**
US 101	SR 237 to Moffett	SB	AM	3	5,305	25	70 7	F		168	5,473	**73.0**	**F**	**2.43**
US 101	SR 237 to Moffett	SB	PM	3	6,604	55	40 0	D		422	7,025	42 6	D	6 11
US 101	SR 237 to Moffett	NB HOV	AM	1	1,630	20	81 5	F		77	1,707	**85.4**	**F**	**3.36**
US 101	SR 237 to Moffett	NB HOV	PM	1	1,483	60	24 7	D		37	1,521	25 3	D	1 62
US 101	SR 237 to Moffett	SB HOV	AM	1	1,736	60	28 9	D		55	1,791	29 9	D	2 39
US 101	SR 237 to Moffett	SB HOV	PM	1	1,401	60	23 3	C		89	1,490	24 8	D	3 89
US 101	Mathilda to SR 237	NB	AM	3	5,190	20	86 5	F		109	5,299	**88.3**	**F**	**1.58**
US 101	Mathilda to SR 237	NB	PM	3	5,398	60	30 0	D		67	5,465	30 4	D	0 97
US 101	Mathilda to SR 237	SB	AM	3	6,896	50	46 0	D		92	6,988	**46.6**	**E**	**1.33**
US 101	Mathilda to SR 237	SB	PM	3	5,709	60	31 7	D		212	5,921	32 9	D	3 07
US 101	Mathilda to SR 237	NB HOV	AM	1	1,960	35	56 0	F		41	2,001	**57.2**	**F**	**1.79**
US 101	Mathilda to SR 237	NB HOV	PM	1	1,285	60	21 4	C		16	1,301	21 7	C	0 69
US 101	Mathilda to SR 237	SB HOV	AM	1	1,796	60	29 9	D		24	1,820	30 3	D	1 04
US 101	Mathilda to SR 237	SB HOV	PM	1	1,444	60	24 1	D		53	1,497	25 0	D	2 33
SR 85	Central Expwy to US 101	NB	AM	2	3,469	20	86 7	F		82	3,551	**88.8**	**F**	**1.79**
SR 85	Central Expwy to US 101	NB	PM	2	2,233	65	17 2	C		58	2,291	17 6	C	1 25
SR 85	Central Expwy to US 101	SB	AM	2	1,672	65	12 9	B		64	1,736	13 4	B	1 39
SR 85	Central Expwy to US 101	SB	PM	2	3,777	25	75 5	F		157	3,934	**78.7**	**F**	**3.42**
SR 85	Central Expwy to US 101	NB HOV	AM	1	1,076	65	16 5	C		26	1,101	16 9	C	1 11
SR 85	Central Expwy to US 101	NB HOV	PM	1	558	65	8 6	A		14	573	8 8	A	0 63
SR 85	Central Expwy to US 101	SB HOV	AM	1	836	65	12 9	B		32	868	13 4	B	1 39
SR 85	Central Expwy to US 101	SB HOV	PM	1	854	65	13 1	B		36	889	13 7	B	1 55
SR 237	Maude to US 101	WB	AM	2	3,333	60	27 8	D		16	3,349	27 9	D	0 35
SR 237	Maude to US 101	WB	PM	2	4,622	55	42 0	D		68	4,690	42 6	D	1 48
SR 237	Maude to US 101	EB	AM	2	3,513	25	70 3	F		72	3,585	**71.7**	**F**	**1.57**
SR 237	Maude to US 101	EB	PM	2	1,809	65	13 9	B		7	1,816	14 0	B	0 15
SR 237	US 101 to Mathilda	WB	AM	2	4,129	60	34 4	D		133	4,262	35 5	D	2 89
SR 237	US 101 to Mathilda	WB	PM	2	4,482	55	40 7	D		72	4,554	41 4	D	1 57
SR 237	US 101 to Mathilda	EB	AM	2	2,799	15	93 3	F		101	2,900	**96.7**	**F**	**2.20**
SR 237	US 101 to Mathilda	EB	PM	2	3,092	60	25 8	D		233	3,325	27 7	D	5 07
SR 237	Mathilda to N Fair Oaks	WB	AM	2	3,944	60	32 9	D		94	4,039	33 7	D	2 05
SR 237	Mathilda to N Fair Oaks	WB	PM	2	4,746	55	43 1	D		65	4,811	43 7	D	1 42
SR 237	Mathilda to N Fair Oaks	EB	AM	2	3,642	25	72 8	F		105	3,747	**74.9**	**F**	**2.28**
SR 237	Mathilda to N Fair Oaks	EB	PM	2	2,713	60	22 6	C		241	2,954	24 6	D	5 24
SR 237	Mathilda to N Fair Oaks	EB HOV	AM	1	1,780	60	29 7	D		43	1,822	30 4	D	1 85
SR 237	Mathilda to N Fair Oaks	EB HOV	PM	1	696	65	10 7	B		10	706	10 9	B	0 42

Notes:

[1] Lanes and speed from VTA 2000 CMP Monitoring Data with 0 5 percent growth factor per year applied to the volumes Baseline volumes also include trips associated with the CUP

[2] LOS based on density presented in CMP monitoring report

Significant and potentially significant impacts are indicated in **bold**

Table 5.3-9
Freeway Segment Analysis-Alternative 5 w/ Additonal Housing (External Locations)

Freeway	Segment	Peak Hour	Existing LOS NB/EB	Existing LOS SB/WB	Incl. HOV in 2013?	Mixed-Flow Lanes NB/EB	Mixed-Flow Lanes SB/WB	1% of Capacity NB/EB	1% of Capacity SB/WB	Project Trips NB/EB	Project Trips SB/WB	% of Capacity NB/EB	% of Capacity SB/WB	Potentially Significant Impact? NB/EB	Potentially Significant Impact? SB/WB
SR 85	Homestead to Fremont	AM	F	D	Y	2	2	44	44	54	5	1 2%	0 1%	**YES**	No
		PM	D	E	Y	2	2	44	44	5	69	0 1%	1 6%	No	**YES**
SR 85	Winchester to Saratoga	AM	F	D	Y	2	2	44	44	27	2	0 6%	0 1%	No	No
		PM	D	F	Y	2	2	44	44	2	34	0 1%	0 8%	No	No
SR 85	Almaden to Camden	AM	E	D	Y	2	2	44	44	14	1	0 3%	0 0%	No	No
		PM	D	D	Y	2	2	44	44	1	17	0 0%	0 4%	No	No
SR 17	Bear Creek to SR 9	AM	F	C	N	2	2	44	44	6	1	0 1%	0 0%	No	No
		PM	C	F	N	2	2	44	44	1	8	0 0%	0 2%	No	No
SR 87	Curtner to Almaden	AM	F	C	Y	2	2	44	44	8	1	0 2%	0 0%	No	No
		PM	D	F	Y	2	2	44	44	1	10	0 0%	0 2%	No	No
SR 87	Julian to Taylor	AM	F	B	Y	2	2	44	44	22	2	0 5%	0 0%	No	No
		PM	C	D	Y	2	2	44	44	2	28	0 0%	0 6%	No	No
US 101	Cochrane to Scheller	AM	F	C	N	3	3	69	69	6	1	0 1%	0 0%	No	No
		PM	D	D	N	3	3	69	69	1	8	0 0%	0 1%	No	No
US 101	Tully to Story	AM	F	C	Y	3	3	69	69	22	2	0 3%	0 0%	No	No
		PM	D	F	Y	3	3	69	69	2	28	0 0%	0 4%	No	No
US 101	McKee to Old Oakland	AM	F	C	Y	3	3	69	69	44	4	0 6%	0 1%	No	No
		PM	C	E	Y	3	3	69	69	4	55	0 1%	0 8%	No	No
US 101	DeLaCruz to Montague	AM	E	D	Y	3	3	69	69	54	5	0 8%	0 1%	No	No
		PM	D	F	Y	3	3	69	69	5	69	0 1%	1 0%	No	**YES**
US 101	Oregon/Embarcadero to	AM	F	F	Y	3	3	69	69	33	3	0 5%	0 0%	No	No
	University	PM	F	F	Y	3	3	69	69	3	42	0 0%	0 6%	No	No
US 101	Woodside to Whipple	AM	E	F	Y	3	3	69	69	10	1	0 1%	0 0%	No	No
		PM	F	F	Y	3	3	69	69	1	12	0 0%	0 2%	No	No
SR 84	University to Alameda Co	AM	A	F	N	3	3	69	69	1	14	0 0%	0 2%	No	No
	Line	PM	F	A	N	3	3	69	69	17	1	0 2%	0 0%	No	No
I-280	Saratoga to Lawrence	AM	F	D	Y	3	3	69	69	27	2	0 4%	0 0%	No	No
		PM	D	E	Y	3	3	69	69	2	34	0 0%	0 5%	No	No
I-680	SR 237 to Jacklin	AM	E	D	N	3	3	69	69	2	24	0 0%	0 3%	No	No
		PM	F	D	N	3	3	69	69	30	2	0 4%	0 0%	No	No
I-680	Scott Creek to SR 238	AM	N/A	N/A	N	3	3	69	69	2	22	0 0%	0 3%	No	No
		PM	D	A	N	3	3	69	69	28	2	0 4%	0 0%	No	No
I-680	SR 84 to Bernal	AM	N/A	N/A	N	3	3	69	69	2	21	0 0%	0 3%	No	No
		PM	B	A	N	3	3	69	69	27	2	0 4%	0 0%	No	No
I-680	I-580 to Alcosta	AM	N/A	N/A	N	3	3	69	69	1	9	0 0%	0 1%	No	No
		PM	A	A	N	3	3	69	69	11	1	0 2%	0 0%	No	No
I-580	I-205 to SR 84/1st	AM	N/A	N/A	N	4	4	92	92	1	8	0 0%	0 1%	No	No
		PM	C	A	N	4	4	92	92	10	1	0 1%	0 0%	No	No
I-580	Santa Rita to I-680	AM	N/A	N/A	N	4	4	92	92	1	10	0 0%	0 1%	No	No
		PM	F	A	N	4	4	92	92	13	1	0 1%	0 0%	No	No
I-880	SR 237 to Dixon	AM	D	D	N	3	3	69	69	2	24	0 0%	0 4%	No	No
		PM	F	D	N	3	3	69	69	31	2	0 4%	0 0%	No	No
I-880	Alv -Niles to Tennyson	AM	N/A	N/A	N	4	4	92	92	5	51	0 1%	0 6%	No	No
		PM	F	B	N	4	4	92	92	65	5	0 7%	0 1%	No	No
SR 237	Zanker to McCarthy	AM	D	F	Y	3	3	69	69	4	46	0 1%	0 7%	No	No
		PM	F	D	Y	3	3	69	69	59	4	0 8%	0 1%	No	No
SR 237	FairOaks to Lawrence	AM	D	D	Y	2	2	44	44	4	49	0 1%	1 1%	No	**YES**
		PM	C	D	Y	2	2	44	44	62	4	1 4%	0 1%	**YES**	No

Notes

[1] Sources Density-based LOS from VTA 2000 CMP Monitoring Data, Alameda County CMP 2000 LOS Monitoring Report, and San Mateo County CMP 1999 Monitoring Report.

[2] Capacity assumes 2,300 vehicles per hour per lane (vphpl) for six- or more lane freeways and 2,200 vphpl for four-lane freeways (auxiliary lanes are not included).

Significant and potentially signficant impacts are indicated in bold.

full-time residents on site. However, no secondary impacts to transit systems are anticipated.

3. Effects on the Bicycle Network

The addition of housing units under Alternative 5 would not change project impacts to the bicycle system identified in the DEIS. Although more internalized trips could reduce the number of external bicycle trips through the Ellis Street underpass at Highway 101, the project is still expected to result in a significant impact at this location, which requires the mitigation identified as CIR-6. With this mitigation, the impact would be reduced to less than significant.

4. Effects on Pedestrian Facilities

Effects on pedestrian facilities would be the same as presented in the DPEIS.

B. Conclusions

The provision of additional housing as a new mitigation measure for Alternative 5 is not expected to result in any secondary transportation and circulation impacts. All other mitigation measures required for Alternative 5 (Mitigation Measures CIR-1, CIR-3, and CIR-6) would still be required with the provision of additional housing. The configuration for the Moffett Boulevard-Clark Memorial Drive/R.T. Jones Road intersection described under Mitigation Measure CIR-3 would still be needed, even with increased trip internalization to Moffett Field.

Potential freeway impacts would still be considered significant and unavoidable, but the additional mitigation measure would reduce impacts to the regional roadway system, both on nearby segments and on the external segments located more than 16 kilometers (10 miles) from the site.

5.4 AIR QUALITY

This chapter assesses the air quality impacts associated with the implementation of additional housing for Alternative 5 under SOCIO-1b. This analysis was conducted by Illingworth and Rodkin.

Mitigation Measure SOCIO-1b, which would apply to Alternative 5, proposes additional housing in the Bay View and NASA Research Park areas. The addition of student apartments, dormitories, townhomes and apartments along with the reduction of some office uses would result in higher air pollutant emissions due to additional construction. With the implementation of the additional housing mitigation measure, air pollutant emissions are predicted to be about 20 to 30 percent higher than emissions associated with Alternative 5 as analyzed in the Draft Programmatic EIS (DPEIS), which did not include Mitigation Measure SOCIO-1b. However, these impacts would still be within the significance thresholds identified for Alternatives 2 through 5 in the DPEIS and would remain the same mitigation measures as in the EIS.

Maximum annual construction and operational emissions both with and without the additional housing are shown in Table 5.4-1. Without appropriate mitigation, annual NOx emissions would exceed de minimus levels for both NOx and CO. NOx emissions are predicted at 99.4 tonnes per year (109 tons per year) if constructed over a 10-year build-out period, which would exceed allowed de minimus levels of 91 tonnes (100 tons) per year. If the build out period were increased to 11 years, then annual NOx emissions are predicted at 91 tonnes per year (100 tons per year). Mitigation Measure AQ-2 already requires that the project be phased so that it would fall within the de minimus levels. As with Alternative 5 as analyzed in the DPEIS, CO emissions with the additional housing would exceed the de minimus levels, requiring a CO SIP conformity determination. Emissions of ROG with the additional housing would remain below the de minimus level.

Daily operational emissions would be about 30 to 35 percent greater with the additional housing than would be operational emissions associated with the Alternative 5 as analyzed in the DPEIS. These emissions are reported in Table 5.4-2. Daily emissions associated with this alternative would exceed the

TABLE 5.4-1 **MAXIMUM ANNUAL CONSTRUCTION AND OPERATIONAL EMISSIONS IN KILOGRAMS PER DAY (POUNDS PER DAY)**

Description	ROG	NOx	CO
Alternative 5 (10-year build out)	13 (15)	83 (91)	287 (315)
Alternative 5 w/additional housing (10-year build out)	17 (19)	99 (109)	380 (417)
Alternative 5 w/additional housing (11-year build out)	15 (17)	91 (100)	356 (390)
de minimus levels	*91 (100)*	*91 (100)*	*91 (100)*

TABLE 5.4-2 **AIR POLLUTANT EMISSIONS ASSOCIATED WITH PROJECT OPERATION IN KILOGRAMS PER DAY (POUNDS PER DAY)**

Description	2010 (~75% Build Out)			2015 (~100% Build Out)		
	ROG	NOx	PM_{10}	ROG	NOx	PM_{10}
Alternative 5 (from DPEIS)	28 (62)	87 (193)	34 (76)	25 (56)	104 (230)	47 (101)
Alternative 5 w/additional housing)	37 (82)	113 (250)	46 (102)	38 (85)	135 (299)	62 (137)
BAAQMD Thresholds	36 (80)	36 (80)	36 (80)	36 (80)	36 (80)	36 (80)

BAAQMD significance thresholds for ROG, NOx and PM_{10} at both 75 percent and 100 percent build out. Emissions associated with the Alternative 5 scenario

analyzed in the DPEIS exceeded the BAAQMD significance thresholds for NOx and PM_{10} only. This would be a significant impact, as is already disclosed in Impact AQ-1 of the Draft EIS.

The addition of housing as mitigation under Alternative 5 would not increase peak-hour traffic. Therefore, carbon monoxide concentrations associated with Alternative 5 with additional housing would be equal or less than those that were predicted under Alternative 5 as analyzed in the DPEIS. As a result, the project would conform to the approved Carbon Monoxide SIP (BAAQMD 1994), since violations of the carbon monoxide ambient air quality standards are not predicted.

5.5 INFRASTRUCTURE

This chapter assesses infrastructure impacts that would result from the provision of additional housing under Mitigation Measure SOCIO-1b.

Overall, the increased housing elements in Bay View and NASA Research Park proposed in Mitigated Alternative 5 of the Final Programmatic EIS would not require the installation of utility infrastructure that would not have been required under the Draft Programmatic EIS. Demands would increase for water, sanitary sewer, electric and gas. However, as discussed below, these increases are either within the range of values that can be accommodated by the conservative parameters used at this very preliminary level of design or, in the case of water, do not form the basis for design of the utility system.

A. Water

The design of water systems is based on fire flow requirements. The increase in potable water demand does not affect the fire flow requirements. Therefore, no changes to the proposed water system would be required. The annual potable water demand would increase as shown in Table 5.5-1.

The total annual potable demand from the revised Alternate 5 represents an increase of 159 mega-liters (42 million gallons) above the existing annual demand. This is roughly 0.12 percent of the total water demand on the SFWD system projected for 2030, which would not constitute a significant impact.

B. Reclaimed Water

Reclaimed water demand is not affected by the increased housing. Therefore, no changes to the proposed reclaimed water system will be required.

TABLE 5.5-1 **INCREASE IN ANNUAL WATER DEMAND**

	Annual Water Demand in Mega-Liters (Annual Demand in Millions of Gallons) Comparison of Alternative 5	
Development Area	**Draft EIS**	**Final EIS**
NRP	291.0 (76.9)	371.7 (98.2)
Bay View	183.9 (48.6)	266.3 (70.4)
Eastside/Airfield	36.5 (9.6)	36.5 (9.6)
Ames Campus	224.7 (59.4)	224.7 (59.4)
Ames Campus Irrigation	153.6 (40.6)	153.6 (40.6)
Total	890 (232)	1,053 (278)

C. Sanitary Sewer

The increase in sewer demand for both the eastern and western sanitary sewer systems are within the range of values that can be accommodated by the assumed design parameters. Therefore, no changes to the proposed sewer systems will be required. The sewer demands will increase as shown in Tables 5.5-2 and 5.5-3.

TABLE 5.5-2 **INCREASE IN EASTERN SANITARY SEWER SYSTEM DEMANDS**

	Peak Wet Weather Flow Comparison of Alternative 5	
	Draft EIS	**Final EIS**
Flow rate for determining impacts to pipe system liters per minute (gpm)	5,057 (1,336)	5,443 (1,438)
Flow rate for determining impacts to treatment plant mega-liters per day (MGD)	3.33 (0.88)	3.56 (0.94)

TABLE 5.5-3 **INCREASE IN WESTERN SANITARY SEWER SYSTEM DEMANDS**

	Peak Wet Weather Flow Comparison of Alternative 5	
	Draft EIS	**Final EIS**
Flow rate for determining impacts to pipe system liters per minute (gpm)	4,460 (1,178)	4,840 (1,278)
Flow rate for determining impacts to treatment plant mega-liters per day (MGD)	3.22 (0.85)	3.41 (0.90)

The increases in demand will not change the mitigation measures required for the proposed development.

TABLE 5.5-4 **INCREASE IN ANNUAL GAS DEMAND**

	Annual Gas Demand in giga-joules (Annual Demand in kilo-therms) Comparison of Alternative 5	
Development Area	**Draft EIS**	**Final EIS**
NRP	268,935 (2,549)	291,619 (2,764)
Bay View	92,107 (873)	121,965 (1,156)
Eastside/Airfield	30,913 (293)	30,913 (293)
Ames Campus	340,257 (3,225)	340,257 (3,225)
Total	732,212 (6,940)	784,754 (7,438)

D. Storm Drainage

Storm water runoff would not be affected by the increased housing. Therefore, no changes to the proposed storm drainage system will be necessitated by the increased housing. Changes to the system are required for other reasons. The revised system is described in the Final EIS in Section 4.5.

E. Electric Service

The increase in electricity demand due to the increased housing is less than 2 percent. Therefore, no changes to the proposed electrical system will be

necessitated by the increased housing. Capacity of the transmission lines supplying Ames Research Center are more than adequate to accommodate this slight increase.

F. Natural Gas Service

The increase in gas demand is within the range of values that can be accommodated by the assumed design parameters. Therefore, no changes to the proposed gas system would be required. The gas demand will increase as shown in Table 5.5-4. Capacity of the main gas lines supplying Ames Research Center are more than adequate to accommodate the increase shown in the table.

Revised demand tables for water, sanitary sewer and gas are provided in Appendix H.

5.6 SERVICES

This chapter identifies potential impacts on the provision of services to Ames Research Center from the implementation of Mitigation Measure SOCIO-1b.

A. Fire and Police

Impacts to fire and police services would be the same as presented in the DPEIS.

B. Solid Waste

Using the population and employment numbers from the Mitigated Alternative 5, the amount of new waste generated would be approximately 6,331 tonnes (6,980 tons per year).[11] This estimate is based on assumptions of 2.0 kilograms (4.5 pounds) of waste per person per day in residential units, and 1.02 kilograms (2.25 pounds) of waste per employee per day. This would be a small fraction of the 820 million kilograms (900,000 tons) per year of waste that the Newby Island Landfill receives, and so would not significantly hasten the forecasted close of that landfill in 2020. In addition, Ames currently diverts 63 percent of its solid waste from landfills through recycling and composting programs. Implementation of these programs would be required of the Bay View residents. Thus there would be no impact on regional solid waste disposal from implementation of the NADP.

Remaining information would be the same as presented in DPEIS.

C. Schools

Potential numbers of elementary and high school students in the proposed housing have been estimated using the number of new townhome and

[1] Based on information provided by the Franklin Associates *Characterization of Municipal Solid Waste in the United States, 1998 Update*. July, 1999.

apartment units. As shown in Table 5.6-1, the number of students generated under the Mitigated Alternative 5 would be 147 elementary and 40 high school students. These numbers were used as the basis for this impacts analysis.

1. Mountain View and Whisman School Districts

As described in Section 3.6 of the EIS, children at Ames Research Center would attend school in the Mountain View-Whisman School District, which serves children from kindergarten through eighth grade. The existing capacity in the Mountain View-Whisman School District as of Fall 2001 could accommodate an additional 23 students. Although Mitigated Alternative 5 would exceed the District's surplus capacity by 124 students, development under the NADP with the Mitigated Alternative 5 would also pay school Developer Impact Fees that would be used by the Mountain View-Whisman School District to build new classrooms and other necessary facilities.

Table 5.6-2 contains a comparison of the additional facilities cost generated by the students in excess of the District's current capacity and the revenue from the Developer Impact Fee. The analysis uses the Mitigated Alternative 5 as a basis for the comparison. According to this calculation, the Developer Impact Fee would generate a surplus of $11,710 above the facilities cost. Therefore, no significant impact would occur.

2. Mountain View-Los Altos Union High School District

High School-age students living at Ames Research Center would attend schools in the Mountain View-Los Altos Union High School District. As of October 2001, Los Altos High School was 121 students under capacity. This would allow more than enough space for the 40 high school students that would be expected from implementation of the NADP.

3. Cumulative Impacts

The cumulative projects identified in Chapter 2 are primarily employment generating, with relatively few residential projects. The cumulative projects include 275 additional residential units in Mountain View, which would generate 36 elementary school students and 10 high school students.

TABLE 5.6-1 **STUDENT GENERATION ESTIMATE FOR THE MITIGATED ALTERNATIVE 5**

School District	Student Generation Ratio (per unit) (a)	Alternative 5 with SOCIO-1b	
		Units	Students
Mtn View-Whisman District			
Grades K-3	0.066	1,120	74
Grades 4-5	0.029	1,120	32
Grades 6-8	0.037	1,120	41
Total Elementary (b)			**147**
Mtn View-Los Altos High			
	0.036	1,120	**40**
TOTAL STUDENTS			**187**

Notes:
(a) Student Generation Estimates from Mountain View Elementary School District Development Impact Fee Justification Study, April 27, 1999.
(b) Numbers do not sum due to rounding.

Source: Schoolhouse Services; Bay Area Economics, 2001.

TABLE 5.6-2 **MOUNTAIN VIEW-WHISMAN SCHOOL DISTRICT FACILITIES IMPACT ESTIMATE**

ADDITIONAL STUDENTS		Students	Classrooms (a)
Projected Additional Mountain View-Whisman School District Students (Net of current excess capacity in the District)		125	7
FACILITY COSTS PER ADDITIONAL CLASSROOM (b)			
Classrooms	$160,000		
Core Facilities	$57,600		
Restroom Facilities	$24,000		
Total	**$241,600**		
FACILITIES IMPACT			
NADP Developer Impact Fee (c)	$1,702,910		
Additional Facilities Cost	$1,691,200		
Surplus/(Deficit)	**$11,710**		

Notes:
(a) Students per classroom: 19.8 Based on the average classroom size in Mountain View School District in 1999. Number of classrooms rounded up to nearest whole number.
(b) Cost assumptions from Mountain View School District Developer Impact Fee Justification Study, 1999. Assumes additional classrooms will be built on existing school property due to high cost and low availability of land in Mountain View. Cost of additional classrooms assumes half are permanent and half are portable, per Mountain View School District Developer Impact Fee Justification Study, 1999.
(c) From Table 5.9-1. Fiscal Impact Summary of Alternative 5 with Mitigation Measure SOCIO-1b.
Source: Schoolhouse Services; Mountain View-Whisman School District; Bay Area Economics, 2002.

These additional elementary school students from cumulative projects exceed the current capacity of the Mountain View-Whisman School District. This impact would be mitigated through the payment of standard developer impact fees by both residential and commercial development.

The additional high school students from cumulative projects could be accommodated in the Mountain View-Los Altos Union High School District.

5.7 NOISE

This chapter assesses the noise impacts that would result from the provision of additional housing under Mitigation Measure SOCIO-1b.

The additional housing proposed under Mitigation Measure SOCIO-1b for Alternative 5 includes housing in both Bay View and the NASA Research Park (NRP). Noise sources in these areas include aircraft operations from the airfield, testing in wind tunnels and traffic noise.

The additional housing proposed in Bay View would be compatible with the existing and future noise environment. Future noise exposure where additional housing is proposed would be 60 dBA Ldn or lower. As a result, no adverse impacts would be expected with this additional housing.

Additional housing is also proposed in the NRP where future noise exposure is 60 to 70 dBA Ldn. The following impacts are predicted under the build out of Alternative 5 with the additional housing mitigation:

- Additional housing proposed at Parcel 6 would be exposed to noise levels of 60 to 65 dBA Ldn. This would be considered "conditionally acceptable."
- Additional housing proposed at Building 20 would be exposed to noise levels 65 to 70 dBA Ldn, which is also considered "Conditionally Acceptable" by California Planning Guidelines and HUD guidelines but not Santa Clara County guidelines. Housing in Building 19 would be exposed to 70 to 75 dBA, which is above California Planning Guidelines conditionally acceptable levels but is still conditionally acceptable to HUD.

Mitigation Measures NOISE-1A and NOISE-1B would apply to additional housing proposed in the NRP.

Changes to traffic resulting from the additional housing are not predicted to change traffic noise levels at off-site noise sensitive locations. No adverse noise impacts are predicted with the implementation of the additional housing mitigation measure.

5.8 RECREATION

This section identifies potential impacts on recreational land uses at Ames Research Center and its immediate surroundings from the Mitigated Alternative 5.

A. Impact Discussion

This section discusses the potential recreational impacts of Mitigated Alternative 5. Parkland calculations are shown in Table 5.8-1. For ease of comparison, the calculations for all alternatives are provided in the table.

1. Quantity of New and Existing Parkland

a. Mitigated Alternative 5

Mitigated Alternative 5 proposes the addition of approximately 6.4 hectares (15.7 acres) of new park space to the NRP area, as well as approximately 4.6 hectares (11.4 acres) of new active recreational space in the Bay View area and approximately 3.2 hectares (7.8 acres) in the Ames Campus area for a total of 14.1 hectares (34.9 acres).

Approximately 12 hectares (28 acres) of existing undeveloped land in the Bay View area would be developed, leaving a total of approximately 22.35 hectares (55.23 acres) of passive open space, which would function as wildlife habitat. No additional active parkland would be lost under this alternative.

Mitigated Alternative 5 would add new residents and employees, who would generate a total demand for 10.2 hectares (25.3 acres) of new parkland. Mitigated Alternative 5 would supply 14.1 hectares (34.9 acres) of new parkland for a surplus of 3.9 hectares (9.6 acres).

TABLE 5.8-1 **PARKLAND CALCULATIONS - MITIGATED ALTERNATIVE 5**

	Alternative					
	1	2	3	4	5	Mit. Alt.5
Proposed New Parkland hectares (acres)	0	9.3 (22.9)	4.7 (11.5)	7.6 (18.9)	14.1 (34.9)	14.1 (34.9)
New Residents	0	2,009	1,266	2,574	2,808	4,909
Demand Rate	1.2 hectares (3 acres) per 1,000 residents					
New Demand hectares (acres)	0	2.4 (6.0)	1.5 (3.8)	3.1 (7.7)	3.4 (8.4)	5.9 (14.7)
New Employees	0	13,068	11,047	15,599	7,222	7,088
Demand Rate	0.6 hectares (1.5 acres) per 1,000 employees					
New Demand hectares (acres)	0	7.8 (19.6)	6.7 (16.5)	9.4 (23.4)	4.3 (10.8)	4.3 (10.6)
Total New Demand hectares (acres)	0	**10.2 (25.6)**	**8.2 (20.3)**	**12.5 (31.1)**	**7.7 (19.2)**	**10.2 (25.3)**
Surplus or Deficit hectares (acres)	0	**-0.9 (-2.7)**	**-3.5 (-8.8)**	**-4.9 (-12.2)**	**6.4 (15.7)**	**3.9 (9.6)**

2. Quality of Existing and New Parks at Ames Research Center

There would be no negative effects on the quality of any existing or proposed parks or open spaces as a result of implementing Mitigated Alternative 5, except for temporary noise impacts due to construction.

3. Cumulative Impacts

The cumulative projects listed in Chapter 2 would bring new employees and residents to the region. These people would be able to use the many regional recreational facilities described in Section 3.12. Given the large supply of existing recreational sites, no cumulative impacts on recreation are expected. Moreover, the NADP would include a surplus of recreational lands, so it would not add to any cumulative impact that might occur, and could help mitigate these cumulative impacts as the parkland in NRP and Bay View would be open to the community.

5.9 FISCAL ANALYSIS

This chapter describes the fiscal impacts generated by the additional housing that would be constructed under Mitigation Measure SOCIO-1b. As outlined in Chapter 5.1-1, this mitigation would result in a total of 1,120 townhome and apartment units in Bay View and 810 student apartments and dormitories in NRP.

The methodology for estimating fiscal impacts follows the process described in Chapter 4.14 of this EIS. The results are contained in Table 5.9-1.

To the extent that state or federal entities are property developers at ARC, these parties may be exempt from fee exactions such as construction taxes and development fees for local school districts. However, NASA anticipates a mix of exempt and non-exempt entities to undertake development at NRP, including housing. Hence, some revenues would occur. See Chapter 4.14 for more details on this issue.

A. City of Mountain View

This section documents the fiscal impacts to the City of Mountain View that would result from the application of Mitigation Measure SOCIO-1b to Alternative 5.

1. Revenues

a. Sales and Use Taxes

Alternative 5 with added housing is projected to generate approximately $321,383 in annual sales and use tax revenue for the City of Mountain View.

b. Utility Users Tax

Alternative 5 with additional housing is projected to generate approximately $113,659 in annual utility users tax revenue for the City of Mountain View.

Table 5.9-1: Fiscal Impacts Summary of Alternative Five with Mitigation Measure SOCIO 1-b

	Alternative Five
INCREASED REVENUES	
City of Mountain View	
Sales and Use Tax	$323,783
Utility Users Tax	$113,659
Construction Tax (a)	$84,000
Gas Tax	$19,747
Motor Vehicle In-Lieu Fees	$160,974
Total	**$618,162**
Santa Clara County	
Sales and Use Tax	$274,026
Motor Vehicle In-Lieu Fees	$371,889
Transient Occupancy Tax	$397,041
Total	**$1,042,957**
Mountain View-Whisman School District	
Developer Impact Fees (a)	$1,702,910
Federal Impact Aid	$87,048
Revenue Limit	$706,953
Total	**$794,002**
Mountain View-Los Altos Union High School District	
Developer Impact Fees (a)	$845,240
Federal Impact Aid	$6,622
Revenue Limit/State Basic Aid	$4,838
Total	**$11,460**
Subtotal - Revenues	**$2,466,581**
INCREASED EXPENDITURES	
City of Mountain View	
Recreational Program Costs	$430,168
Santa Clara County	$0
Mountain View-Whisman School District	$804,473
Mountain View-Los Altos Union High School District	$332,677
Subtotal - Net Expenditures	**$1,567,319**
NET FISCAL (DEFICIT)/SURPLUS	
City of Mountain View	**$187,994**
Santa Clara County	**$1,042,957**
Mountain View -Whisman School District	**($10,471)**
Mountain View-Los Altos Union High School	**($321,217)**
Total Fiscal (Deficit)/Surplus	**$899,262**

Notes:
(a) One-time revenue excluded from all totals.

Source: Bay Area Economics, 2002.

c. Construction Tax

Alternative 5 with additional housing is projected to generate approximately $87,840 in construction tax revenue for the City of Mountain View.

d. Gas Tax

Alternative 5 with additional housing is projected to generate approximately $19,747 in gas tax revenue for the City of Mountain View.

e. Motor Vehicle In-Lieu Fees

Alternative 5 with additional housing is projected to generate approximately $160,974 in annual motor vehicle in-lieu fees revenue for the City of Mountain View.

2. Costs

a. Police and Fire

Alternative 5 with additional housing, following the application of Mitigation Measure SOCIO-1b, is not expected to create any additional significant impacts for the City of Mountain View with regard to police and fire requirements.

b. Water

NASA will fund all improvements needed to supply the NADP development, mitigating any capital expense impacts to the City of Mountain View. No net fiscal impact resulting from the application of Mitigation Measure SOCIO-1b to Alternative 5 is anticipated.

c. Sewer

Per mitigation measure INFRA-2, NASA and its partners would mitigate their fair share of the capital expense impacts to the Mountain View sewer conveyance and treatment system. No net fiscal impact resulting from the application of Mitigation Measure SOCIO-1b to Alternative 5 is anticipated.

d. Stormwater

NASA and its partners will fully bear the capital expense of upgrading the on-site drainage system. No net fiscal impact resulting from the application of Mitigation Measure SOCIO-1b to Alternative 5 is anticipated.

e. Recreational and Library Facilities

Alternative 5 with additional housing, following the application of Mitigation Measure SOCIO-1b, is expected to generate a $430,168 cost impact in annual Recreational Program costs.

3. Conclusions

As a result of Mitigation Measure SOCIO-1b, Alternative 5 would generate an annual revenue impact of approximately $615,762 and an annual cost impact of approximately $430,168, creating a net fiscal surplus of $185,594 for the City of Mountain View. No adverse impact would occur.

B. Santa Clara County

This section documents the revised fiscal impacts to Santa Clara County resulting from the application of Mitigation Measure SOCIO-1b to Alternative 5.

1. Revenues

a. Sales and Use Taxes

Alternative 5 with additional housing is projected to generate approximately $274,026 in annual sales and use tax revenue for Santa Clara County.

b. Motor Vehicle In-lieu Fees

Alternative 5 with additional housing is projected to generate approximately $371,889 in annual motor vehicle in-lieu fee revenue for Santa Clara County.

c. Transient Occupancy Tax

Alternative 5 with additional housing is projected to generate approximately $397,041 in annual transient occupancy tax revenue for Santa Clara County.

2. Costs

No additional costs impacts to the County are anticipated from Alternative 5 with additional housing and Mitigation Measure SOCIO-1b.

3. Conclusions

As a result of Mitigation Measure SOCIO-1b, Alternative 5 with additional housing would generate an annual net revenue increase of approximately $1,042,957 for Santa Clara County. No adverse impact would occur.

C. Mountain View-Whisman School District

This section documents the revised fiscal impacts to the Mountain View-Whisman School District resulting from the application of Mitigation Measure SOCIO-1b to Alternative 5.

The total amount of housing that would be constructed under Mitigation Measure SOCIO-1b to Alternative 5 would generate approximately 74 K-3 students, 32 students in grades Four through Five, and 41 students in grades Six through Eight. This student population estimate is used as the basis for the Federal Impact Aid and Revenue Limit estimates described below.

1. Revenues

a. Developer Impact fees

Alternative 5, upon application of Mitigation Measure SOCIO-1b, would generate a one-time developer impact fee of $1,702,910 for the Mountain View-Whisman School District.

b. Federal Impact Aid

Under this alternative, NADP would generate approximately $87,048 in annual Impact Aid for the Mountain View-Whisman School District. Due to a number of factors including Congressional appropriations, changes in the program guidelines, and overall student enrollment in the District, it is difficult to produce reliable forecasts of per-student Impact Aid payments in 2013 (NADP's buildout horizon). The Impact Aid projections in this analysis, therefore, are preliminary estimates.

c. Revenue Limit

Alternative 5, following the application of Mitigation Measure SOCIO-1b, would generate approximately $706,953 in additional revenue limit funds to the Mountain View-Whisman School District.

2. Costs

Alternative 5, following the application of Mitigation Measure SOCIO-1b, would generate approximately $804,473 in additional costs to the Mountain View-Whisman School District.

3. Conclusions

Alternative 5, following the application of Mitigation Measure SOCIO-1b, is projected to generate a net annual cost impact of $10,471 to the Mountain View-Whisman School District, which represents 0.05 percent of the District's annual revenue limit. No adverse impact would occur.

D. Mountain View-Los Altos Union High School District

This section documents the revised fiscal impacts to the Mountain View-Los Altos Union High School District resulting from the application of Mitigation Measure SOCIO-1b to Alternative 5.

The total number of housing units to be constructed under Mitigation Measure SOCIO-1b would generate approximately 40 additional high school students.

This student population estimate is used as the basis for the Federal Impact Aid and Revenue Limit impacts described below.

1. Revenues

a. Developer Impact Fees

Alternative 5, upon application of Mitigation Measure SOCIO-1b, would generate a one-time developer impact fee of $845,240 for the Mountain View-Los Altos Union High School District.

b. Federal Impact Aid

Under this alternative, NADP would generate approximately $6,622 in annual Impact Aid for the Mountain View-Los Altos Union High School District. Due to a number of factors including Congressional appropriations, changes in the program guidelines, and overall student enrollment in the District, it is difficult to produce reliable forecasts of per-student Impact Aid payments in 2013 (NADP'S buildout horizon). The Impact Aid projections in this analysis, therefore, are preliminary estimates.

c. Revenue Limit/State Basic Aid

Alternative 5, following the application of Mitigation Measure SOCIO-1b, would generate approximately $4,838 in basic aid funds to the Mountain View-Los Altos Union High School District.

2. Costs

Alternative 5, following the application of Mitigation Measure SOCIO-1b, would generate approximately $332,677 in additional costs to the Mountain View-Los Altos Union High School District.

3. Conclusions

Alternative 5, following the application of Mitigation Measure SOCIO-1b, is projected to generate a net annual cost impact of $321,217 to the Mountain View-Los Altos Union High School District, which represents 1.09 percent of the District's annual revenue limit.

As discussed in Chapter 4.14, these net cost impacts are based on highly conservative assumptions regarding additional property tax increment. Specifically, the analysis assumes that property values will remain stagnant and the District would not receive any funding from additional tax increment over the next 11 years. However, it is highly likely that property tax values will increase and return the District's per-student revenue limit funds to their current level. Furthermore, the Mountain View-Los Altos Union High School District is an exception from the typical California public school finance system in that it is a State Basic Aid District. This fact indicates that it already has a higher per-student revenue limit than other high school districts and that it has a strong financial position. With these factors in mind, the analysis concludes that under Mitigated Alternative 5, increases in costs for high schools could exceed the revenue limit by more than 0.5 percent, creating a significant impact. The NADP impact on the Mountain View-Los Altos Union High School District shall be reviewed upon buildout of NADP and establishment of the actual number of high school students generated by on-site housing.

Impact SOCIO-3: Under Alternatives 2, 4, 5, and Mitigated Alternative 5, increases in costs generated by ARC high-school students could exceed 0.5 percent of the Mountain View-Los Altos Union High School District annual revenue limit.

Mitigation Measure SOCIO-3: NASA and the Mountain View-Los Altos Union High School District will negotiate an agreement whereby in any given year, should the Mountain View-Los Altos Union High School District's per student operating revenues decrease below a pre-determined baseline as a direct result of enrollment generated by NADP, NASA's partners will compensate the District for the shortfall associated with these students. The baseline would be set to District's per student operating revenues in the year prior to when students residing at ARC first begin attending classes in the district, and would be adjusted for cost of living and inflationary changes over time.

E. San Francisco Water Department and East Bay Municipal Utilities District

Water service providers set their rate structure to assure that services are fully paid for by users. Therefore, the provision of water service to ARC after implementation of Alternative 5 with Mitigation Measure SOCIO-1b would not result in a net fiscal impact to these agencies.

F. Sunnyvale Water Pollution Control Plant and Palo Alto Regional Water Quality Control Plant

Sewer service providers set their rate structure to assure that services are fully paid for by users. Therefore, under Alternative 5 with Mitigation Measure SOCIO-1b, no net fiscal impact would occur to these sewer service providers.

6 OTHER NEPA INFORMATION

The following chapter contains other NEPA information for the proposed NASA Ames Development Plan alternatives regarding local short-term uses versus long-term productivity, irreversible and irretrievable commitments of resources, growth-inducing effects, cumulative effects, and the project's relationship to federal environmental laws and executive orders.

6.1 Local Short-Term Uses of the Environment Versus Long-Term Productivity

NEPA requires that an EIS consider the relationship between short term uses of the environment and the maintenance and enhancement of long-term productivity. This consideration is especially relevant in projects that affect natural resource areas, where resources could be extracted or depleted in the short term to the detriment of the long-term maintenance of these resources.

The proposed NASA Ames Development Plan would not harm long-term productivity or the availability of natural resources over the long-term. As documented in this EIS, no natural resources would be extracted or impaired as a result of this project. In fact, the NADP would result in positive long-term impacts, since the Plan's implementation would allow NASA to continue its mission at Ames Research Center and to engage in new partnerships with private and academic institutions in astrobiology, nanotechnology, and space research, while protecting wetlands and other wildlife habitat.

6.2 Irreversible and Irretrievable Commitments of Resources

The proposed NADP alternatives would not cause any significant new irreversible and irretrievable commitments of non-renewable resources to uses that future generations would be unable to reverse. Most development under the NADP would occur on land that is already urbanized, so the new development would not alter the fundamental urbanized character of Ames Research Center.

The only exception to this statement would occur in the Bay View area, where construction would occur on undeveloped land, committing open lands to residential use. This would not constitute a significant impact in and of itself, since the land that would be converted does not currently harbor critical habitat or other protected natural resources. No impacts associated with the conversion of this land are found in this EIS.

6.3 GROWTH-INDUCING EFFECTS

A project is considered to be growth-inducing if it fosters economic or population growth beyond the boundaries of the project site. Typical growth inducements might be the extension of urban services or transportation infrastructure to a previously unserved or under served area or the removal of major boundaries to development.

The proposed NADP alternatives would result in the creation of new jobs and housing, which would be likely to induce population and housing growth in the region. These impacts are fully covered in Chapter 4 of this EIS, particularly in Section 4.14, which addresses socio-economic impacts including the alternatives' impacts on the regional housing supply. As noted in Section 4.14, impacts on the regional housing supply would be significant and unavoidable, even though the project would supply on-site housing for employees and students.

6.4 CUMULATIVE EFFECTS

Cumulative impacts occur when two or more individual effects together create a considerable environmental impact, or if they compound or increase other environmental impacts. Cumulative impacts are those that result from the incremental impacts of an action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Cumulative impacts from the NADP alternatives combined with other projects in the vicinity of Ames Research Center have been addressed throughout this EIS. Chapter 2 lists the cumulative projects that were considered in this EIS. All of the analyses in Chapter 4 address future cumulative conditions with these cumulative projects. Table 6.4-1 provides a summary of those issue areas under which the implementation of the NADP Preferred Alternative would result in environmental and/or cumulative impacts.

The most significant area in which cumulative impacts could occur is related to traffic, which is considered in Sections 3.3 and 4.3 of this EIS. All traffic analyses in this EIS are based on a future baseline condition that include expected future development at Ames Research Center as well as the cumulative projects expected outside ARC. All impacts and mitigation measures in the traffic analysis address these future cumulative conditions.

With regards to air quality, the South Bay and greater Bay Area are experiencing continued growth in population and vehicle use that will affect the emission of regional pollutants such as hydrocarbons and oxides of nitrogen. Current projections are that regional emissions of these pollutants will decrease in the future, despite cumulative growth in population and vehicle use, due to regional programs for reducing emissions that are in place or currently being considered. Thus the project would not be expected to add to significant cumulative air quality impacts, since air quality in the region is expected to improve over time. However, cumulative projects in the region are expected to result in increased exposure to toxic air contaminants, as explained in Section 4.4.

The noise analysis in the EIS is based on the traffic analysis, so it covers cumulative conditions in the same manner as the traffic analysis.

Cumulative impacts on infrastructure are addressed in Section 4.5. The cumulative impacts to the sewer piping systems of Sunnyvale and Mountain View were based on the pending projects that will discharge to the same main lines as Ames Research Center. The cumulative impacts to the sewer treatment plants were based on all of the pending projects in each city since they all will ultimately discharge to the plants. The cumulative impacts to the water supply were based on all of the pending projects in both cities combined since Ames Research Center, Sunnyvale and Mountain View all utilize the same source for water.

Cumulative conditions relative to services and socio-economic conditions are addressed in Sections 3.6, 3.12, 3.14, 4.6, 4.12 and 4.14, which include information on cumulative service, recreation, population and employment trends for the area around Ames Research Center. All impacts in Sections 4.6, 4.12 and 4.14 have been identified relative to future cumulative conditions.

Cumulative impacts related to biological resources are addressed in Section 4.9, which explains that the cumulative projects beyond the ARC studied in this EIS would have few impacts on biological resources. However, past projects in the South Bay region have combined to greatly reduce biological resources from levels which previously existed.

Cumulative impacts related to aesthetic resources are addressed in Section 4.11. The proposed project could combine with baseline development to create a visual impact through removal of protected trees within the Ames Research Center. However, Mitigation Measure AES-6, which includes compliance with the City of Sunnyvale's tree ordinance, would reduce these potential impacts to less-than-significant levels.

Cumulative impact analysis is not as relevant for the other environmental factors addressed in this EIS. In most cases, this is because the project itself

TABLE 6.4-1 **SUMMARY OF PROJECT AND CUMULATIVE IMPACTS**

	NADP Preferred Alternative		
Issue	**Without Mitigation**	**With Mitigation**	**Cumulative**
Public Policy			
Land Use			
Traffic and Circulation	X	X	X
Air Quality	X	X	X
Infrastructure and Drainage	X		X
Services	X		X
Hazardous Materials and Site Contamination	X		
Geology	X		
Biological Resources	X		X
Noise	X		
Aesthetics	X		X
Recreation	X		
Cultural Resources	X		
Socio-Economic Conditions	X	X	X

Note: X indicates a significant impact is identified for the preferred alternative or as a result of cumulative projects.

would have no impact on the environmental factor, so there would be no impact from the project which could join with other similar impacts to from a cumulative impact. This is true for public policy and land use. In other cases, impacts would only occur on site and would be mitigated completely, so there would be no chance that impacts would join with other off-site impacts to

become cumulatively significant. This is true for hazardous materials, geology, and cultural resources.

6.5 COMPLIANCE WITH RELEVANT ENVIRONMENTAL LAWS AND EXECUTIVE ORDERS

This section documents the NADP's compliance with federal environmental laws and executive orders.

A. Executive Orders

1. Executive Order 11593 (Historic Properties)

Executive Order 11593 and Section 110 of the National Historic Preservation Act of 1996 (NHPA) provide direction for inventorying and evaluation of historic properties, and for initiating measures and procedures to provide for the maintenance, through preservation, rehabilitation, or restoration, of federally owned and registered sites.

As discussed in Section 3.13, the Ames Research Center site has been systematically surveyed for historic resources as part of a National Park Service survey of NASA centers and various Section 106 surveys.

Several buildings in the Shenandoah Plaza District and Ames Campus areas have been added to the National Register of Historic Places (NRHP). As discussed in Section 4.13, within the Ames Campus, none of the alternatives would result in adverse impacts on any of the buildings listed or eligible for listing on the NRHP. Any rehabilitation that could potentially have an adverse impact in the Shenandoah Plaza District would comply with the Secretary of Interior's Standards, as discussed in Section 4.13. Furthermore, NASA would follow design guidelines for new construction to maintain visual integrity in the District. Modifications, removals, or relocations of contributing elements within the District would follow full consultation pursuant to Section 106 of the NHPA.

2. Executive Order 11988 (Floodplain Management)

Executive Order 11988 directs federal agencies to enhance floodplain values, to avoid development in a floodplain whenever there is a practicable alternative, and to avoid to the extent possible adverse impacts associated with occupancy or modifications of floodplains.

As discussed in Section 3.5, areas within the Ames Research Center site have experienced flooding in the past. Alternatives 2, 4 and 5 would construct housing, child care and other facilities within the 100-year floodplain. However, the site would be filled prior to construction to raise its elevation above the flooding level, thereby avoiding any potential flood impact. A floodplain analysis is included in Section 6.5.C.

3. Executive Order 11990 (Protection of Wetlands)

Executive Order 11990 directs federal agencies to enhance wetland values, avoid development in wetlands whenever there is a practicable alternative, and to the extent possible, avoid adverse impacts associated with occupancy or modifications to wetlands. The Clean Water Act regulatory process requires compliance with federal "no net loss of wetlands" policies and includes a public and agency review process and Clean Water Act Section 404 (b)(1) alternatives analysis that would in practice be likely to require avoidance of impacts on aquatic habitats or compensation for losses in extent and values.

To minimize impact on wetlands, measures would be taken to avoid construction and/or minimize fill activities and other disturbances in jurisdictional wetlands. Subsequent to the US Army Corps of Engineers approval, a wetland enhancement plan for Alternatives 2 and 4 would also be developed for the restoration of functions and values of aquatic habitats. All construction near or adjacent to wetlands would implement standard Best Management Practices to minimize runoff into sensitive areas.

Where some alternatives would result in the loss of small amounts of jurisdictional wetlands, development would be reconfigured to avoid wetland areas identified in the wetland delineation for the project. Alternatively, NASA would develop a wetland mitigation plan to mitigate for any loss of wetlands under the project. This plan would also be submitted for approval to the US Army Corps of Engineers.

Wetlands would be further protected by managing potentially-contaminated runoff using storm water Best Management Practices. Where feasible, the use

of pesticides on landscaping near native habitats would be prohibited. Runoff would be minimized in some areas by using minimal irrigation systems.

4. Executive Order 12873 (Federal Acquisition, Recycling and Waste Prevention)

NASA complies with Executive Order 12873 by incorporating a comprehensive, integrated, and cost-effective approach to waste reduction. As indicated in the discussion on the Solid Waste Disposal Act, below (Section 5.5.B.13), development under the NADP would comply with this executive order by continuing to implement NASA's existing solid waste management, diversion and recycling policies.

5. Executive Order 12898 (Environmental Justice)

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations", directs federal agencies to assess whether their actions have disproportionately high and adverse effects on minority and low-income populations.

There are both low income and minority communities in the ARC area, as discussed in Section 3.14. However, none of the five proposed alternatives would result in any disproportionate adverse impact on minority populations or low-income populations, as explained in Section 4.14.

6. Executive Order 13045 (Protection of Children from Environmental Health Risks and Safety Risks)

Executive Order 13045 requires federal agencies to assign a "high priority" to identify and assess environmental health risks and safety risks that may disproportionately affect children, and ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

As discussed in Section 4.7, NASA is currently conducting a Human Health Risk Assessment to predict site specific risk for exposure to various hazardous materials, including lead paint and several chemicals. NASA has committed to

measures to protect children from hazardous materials. For example, where there is a possibility of children digging down through layers of clean fill over contaminated soils, a protective membrane would be installed to prevent it.

As described in subsection B.2.c of Section 4.7, the HHRA found that most risks associated with contaminants from Navy, NASA and MEW companies are below or within the EPA risk management range.

As identified in this Final EIS, proposed childcare facilities in the Bay View area could be located near the Mountain View Industrial Park, where some businesses handle hazardous materials. Spills or releases at these businesses could expose children to hazardous air pollution. This would be a significant impact. Mitigation Measure HAZ-2 would ensure that childcare facilities would be located at least 305 meters (1,000 feet) from the industrial area of Mountain View, which would limit the area in which industries handling hazardous materials would be prohibited. Mitigated Alternative 5 would locate childcare facilities at least 402 meters (1,320 feet) from the industrial area of Mountain View in accordance with City of Mountain View policy.

NASA also studied the effects of noise in relation to the location of proposed housing and childcare facilities. As discussed in Section 4.10, new development in the NRP area under Alternatives 2 through 5 could create significant land use incompatibilities, since all four propose the development of apartment-style housing and childcare on NRP Parcel 6, a small portion of which is exposed to a DNL of more than 65 dB. This is an unacceptable noise level for residential uses. Therefore, this small area would be used for parking or other non-residential uses. As Alternatives 2, 4 and 5 would locate childcare in the Bay View in Parcel 2, which is located outside of the 60 dB contour, no adverse impact would be expected.

7. Executive Order 13101 (Waste Prevention, Recycling and Federal Acquisition)

Executive Order 13101 articulates federal policy regarding waste reduction. Under this policy, federal agencies are guided to incorporate waste reduction

into daily operations, to work to increase markets for recovered materials, and to prevent pollution.

In compliance with this executive order, the Ames Research Center has implemented recycling programs to reduce waste. Ames Research Center is committed to reducing the volume of solid and hazardous waste generated annually through source reduction and recycling. The current agency-wide goal is to divert 35 percent of solid waste away from landfills by 2010 compared with the 1997 baseline. However, Ames is committed to a more aggressive program and has promulgated guidelines for the purchase of a variety of recycled contents materials from paper products to vehicular products. In addition, Ames has set up a complex system of accountability and reporting to ensure that at least the following items are being recycled wherever feasible; white paper, cardboard, scrap metal, wood and steel. Ames is also committed to purchasing products with recycled or recovered materials content in the percentages specified by the current Federal EPA Guidelines. All of these policies and programs would apply to new development under the NADP.

8. Executive Order 13112 (Invasive Species)

Executive Order 13112 recognizes the ecological impacts of invasive species, discusses control measures to be taken to prevent the introduction of invasive species and outlines the duties of each federal agency whose actions could affect the status of invasive species. It essentially directs federal agencies to prevent the introduction of potentially invasive exotic species and to control invasive exotics on land for which they are responsible.

Section 3.9 states that invasive exotic weeds that crowd out native species grow in some areas of the site. Measures that would minimize the impact of invasion by non-native species and thereby comply with this Executive Order are identified in Section 4.9. For example, landscaping would not use invasive plants and controls to prevent the spread of weeds would be implemented.

9. Executive Order 13123 (Efficient Energy Management)

Executive Order 13123, Greening the Government through Efficient Energy Management, calls for federal agencies to improve the energy efficiency of their buildings, promote the use of renewable energy, and reduce greenhouse gas emissions associated with energy use in their buildings, among other energy-related requirements. It also mandates an energy use reduction of 35% below 1985 levels by 2010. Signed in June of 1999, Executive Order 13123 also directed the Department of Energy to work with other federal agencies to develop a variety of guidance, criteria, tools, and other information to assist agencies in implementing the provisions of the order.

To comply with this order and to reduce energy demand from new development, NASA's design guidelines require that new buildings be designed to be energy efficient. Buildings constructed under the NADP would be 10 percent more efficient then California's Title 24 standards, which by themselves reflect a high degree of energy efficiency. Thus development under the NADP would comply with this executive order.

10. Executive Order 13148 (Environmental Management)

Executive Order 13148, "Greening the Government through Leadership in Environmental Management," directs federal agencies to integrate environmental accountability into day-to-day decision making and long-term planning processes across all agency missions, activities and functions.

As noted in Section B.2.a of Chapter 2 of this EIS, the NADP has been developed to reflect the concept of sustainable development in all aspects of the project, including trip reduction, on-site housing, pedestrian-oriented design, water conservation, energy conservation, habitat preservation and waste reduction. Thus development under the NADP would comply with this executive order.

11. Executive Order 13149 (Reduction in Petroleum Consumption)

Executive Order 13149, "Greening the Government Through Federal Fleet and Transportation Efficiency", directs federal agencies to reduce petroleum

consumption through the improvements in fleet fuel efficiency, the use of alternative fuel vehicles (AFV) and the use of alternative fuels.

These strategies for reducing petroleum consumption are in place at the ARC and would continue under the NADP. Moreover, development under the NADP would include a comprehensive Transportation Demand Management (TDM) program and on-site housing that would both reduce vehicular trips, thereby lessening petroleum use.

12. Executive Order 13150 (Federal Workforce Transportation)

Executive Order 13150, "Federal Workforce Transportation", directs federal agencies to "implement a transportation fringe benefit program." This program would allow qualified federal employees the option to exclude from taxable wages and compensation commuting costs associated with the use of mass transportation and van pools.

This type of program is already available at ARC, and would continue under the NADP. Additionally, the NADP TDM Program would include provision of an "Ecopass" for all on-site employees to encourage employees to commute via transit.

B. Federal Laws

1. Americans With Disabilities Act of 1990

Federal guidelines published in accordance with the Americans With Disabilities Act (ADA) define specific requirements for disabled access to parking facilities, pathways, and buildings. The accessibility requirements apply to private entities that provide public accommodations and to government facilities. All new construction under the NADP would be required to be in full compliance with the ADA.

2. Clean Air Act

Section 118 of the Clean Air Act requires that federal facilities comply with existing federal, state and local air pollution control laws and regulations. NASA must ensure that activities within its administrative jurisdiction meet existing and laws and regulations, and that external sources of air pollution are controlled or mitigated to the extent possible to protect the air quality and resource values.

When total direct and indirect emissions caused by a federal action exceed specified thresholds, actions that cause emissions of nonattainment pollutants are required to complete a formal conformity determination. The conformity analysis evaluates whether a proposed action conforms to the State Implementation Plan (SIP) for a particular pollutant. The general conformity rule applies to any federal action in the Bay Area causing more than 100 tons per year of ROG, NO_x or CO. The analysis considers only those emissions that are reasonably foreseeable and that NASA can practicably control through continuing program responsibility.

In any given year in which construction occurs, emissions of ozone precursors associated with combined construction and operation could exceed levels set forth in the Clean Air Act General Conformity Regulation. To mitigate this and comply with the Act, NASA and its partners would schedule construction to ensure that annual emissions of ozone precursors associated with construction and operation do not exceed a cumulative total of 100 tons per year.

The air quality analysis described in Appendix D indicates that predicted carbon monoxide concentrations associated with the project would not cause or contribute to any new violation of the NAAQS for carbon monoxide or increase the frequency or severity of any existing violation of the carbon monoxide NAAQS.

Pursuant to Section 176 of the Clean Air Act (42 U.S.C. 7476(c)), NASA has determined that implementation of the Proposed Action (Alternative 5) will

conform to the Bay Area Air Quality Management District (BAAQMD) State Implementation Plan for Carbon Monoxide. The applicable state implementation plan for carbon monoxide is the Bay Area Redesignation Request and Maintenance Plan for the National Carbon Monoxide Standard, approved by the EPA on June 1, 1998.

Facilities that could be potential sources of air pollution, such as planned laboratories, would be subject to the permitting regulations and requirements of the BAAQMD. Any uses of toxic gases would comply with the Santa Clara County Toxic Gas Ordinance. Long term residential uses would be avoided at areas located over high concentration zones over the Regional Plume.

Potentially unhealthy air pollutant concentrations of PM_{10} would result from construction emissions associated with new development and renovation of existing facilities. A series of measures to control dust generation, including all measures recommended by BAAQMD, would be incorporated into construction contract specifications and enforced by NASA. Measures to reduce emissions of nitrogen oxides and particulate matter from diesel fuel combustion will also be evaluated and implemented where feasible and reasonable.

3. Noise Control Act

The federal Noise Control Act of 1972 requires compliance with state and local requirements respecting control and abatement of environmental noise and provision of an environment free from noise that jeopardizes health or welfare. Federal management of highway noise is subject to Federal Highway Administration regulations. Federal or federally aided highway projects, and construction of highway projects, must conform with the FHWA noise standards.

Section 3.10 describes the Department of Labor's noise exposure standards for US workers and NASA's own Health Standard on Hearing Conservation, which is applicable to all NASA employees and NASA-controlled, government-owned facilities. NASA's policy is to control noise generated by

its operations and to prevent occupational hearing loss. Though no state or local noise criteria are binding on the type of noise to be created by the NASA Ames Research Center, NASA uses federal, state and local criteria to provide guidance in determining noise impacts, as described in Section 3.10.

Short-term noise disturbances could result from construction activities at the Ames Research Center site. As described in Section 4.10, noise mitigation measures would be included in project design and development, and building designs would provide appropriate Noise Level Reduction. Furthermore, NASA would assign a Noise Disturbance Coordinator to deal with construction-related noise. During development and construction, contractors and equipment operators would be required to comply with local noise ordinances.

As discussed in Section 4.10, the only long-term effect that development of the NADP could have on the noise environment in the area would result from increased vehicular traffic on the street network. The analysis described in Section 4.10 found that increased traffic would not result in any significant adverse impacts.

4. Clean Water Act

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) are responsible for ensuring implementation of and compliance with the provisions of the federal Clean Water Act (CWA) and California's Porter-Cologne Water Quality Control Act. Along with the SWRCB and RWQCB, water quality protection is the responsibility of numerous water supply and wastewater management agencies, as well as city and county governments, and requires the coordinated efforts of these various entities.

Section 401 of the CWA gives individual states the authority to issue, waive, or deny certification that a proposed activity is in conformance with state water quality standards (Water Quality Certification). The State's Regional Water Quality Control Boards review projects, including those that require permits

from the Corps under Section 404 of the CWA. Corps permits are required for all discharges of dredged or filled materials into US waters and wetlands. The Ames Research Center is under the jurisdiction of the San Francisco Bay Water Quality Control Board.

In addition, a revised amendment to the existing construction storm water permit (Water Quality Order 99-08-DWQ)was adopted on August 19, 1999. This amendment includes additional sampling requirements upstream and downstream of a discharge point. The first objective is to identify a sampling and analysis strategy and sampling schedule for discharges from construction activity which discharge directly into water bodies listed as part of Clean Water Act Section 303(d). The second objective is to identify, for all construction activity, a sampling and analysis strategy and sampling schedule for discharges that have been discovered through visual monitoring to be potentially contaminated by pollutants not visually detectable in the runoff. The amendment includes additional requirements for implementation, source identification and monitoring programs. The construction storm water permit for the proposed project would be updated to include the provisions of this amendment.

NASA is planning upgrades to the storm water collection system. As described in Section 3.5, a new storm drain system will be constructed to accommodate the new site layout. Potential construction impacts on water quality, especially with respect to wetlands, are discussed in Section 4.9. NASA would require that all construction near wetland areas implement Best Management Practices to minimize runoff. Post construction planting and other measures would help control erosion.

5. Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972 addresses actions affecting coastal zones and requires that federal actions be consistent with state coastal zone management plans. Under the CZMA, federal actions must be consistent with local coastal zone management programs. In California, these programs generally include the California Coastal Act and Local Coastal Plans. In the

case of the NASA Ames Research Center, the operative coastal zone management program is administered by the San Francisco Bay Conservation and Development Commission (BCDC) and generally consists of the McAteer-Petris Act, BCDC's *San Francisco Bay Plan*, special area plans adopted by BCDC, and BCDC's regulations.

Under the McAteer-Petris Act, BCDC has authority over San Francisco Bay, including all sloughs, to mean high tide, marshlands lying between mean high tide and five feet above mean sea level, and submerged lands lying below Mean low Tide, and over certain named waterways tributary to the Bay that are subject to tidal action. (Govt. Code Sec. 66610(a) and (e).) BCDC also has authority over salt ponds (areas that have been diked off from the Bay for the purpose of producing salt through solar evaporation) and managed wetlands (areas that have been diked off from the Bay and maintained as a duck hunting reserve or wildlife refuge). (Govt. Code Sec. 66610 and (d).) In addition, BCDC has authority over a shoreline band consisting of land 100 feet inland from and parallel to San Francisco Bay. (Govt. Code Sec. 66610(b)).

The BCDC's *San Francisco Bay Plan* contains the BCDC's enforceable policies and designates on Plan Maps the shoreline areas that are reserved for regional high-priority uses such as water-oriented recreation, seaports and airports. BCDC may issue permits for proposed projects in priority use areas if the use is consistent with the designated priority use as well as the other provisions of the McAteer-Petris Act and the Bay Plan. Portions of many priority use areas lie outside BCDC's 100-foot shoreline band jurisdiction and BCDC's authority in these areas is advisory only, except in cases where federal consistency applies.

Bay Plan Map 7 designates Moffett Field as an airport priority use area and the Plan Map policy note regarding Moffett Field states "Moffett Naval Air Station - If and when not needed by the Navy, site should be evaluated for commercial airport by regional airport system study. (Moffett NAS not within BCDC permit jurisdiction.)" Although most of the area proposed for development under the NADP is outside BCDC permit jurisdiction, all of Moffett Field is subject to BCDC's coastal management program authority because Moffett

Field is either in or directly affects the coastal zone. As mentioned above, the CZMA requires that federal actions be consistent with state coastal zone management plans. NASA makes a consistency determination and obtains concurrence from BCDC where the BCDC plan has been approved by the Federal Coastal Zone Management Program in the Department of Commerce.

The NASA Ames Research Center is one mile south of the edge of the San Francisco Bay. The area proposed for development under the NADP is outside the permit jurisdiction of BCDC. In addition, federal agencies do not require permits from BCDC, but must be consistent with the *Bay Plan*. However, Alternatives 2, 3, 4 and 5 would require a new storm water retention basin pump in the area under BCDC permit jurisdiction if the pump is placed on Midpeninsula Regional Open Space District land. NASA would prepare a consistency determination for this pump relative to the *Bay Plan*.

NASA has prepared a consistency determination for the entire NADP project relative to the local coastal zone management program administered by BCDC, and submitted this determination to BCDC on April 12, 2002, with additional information submitted on May 29. This consistency determination concluded that the proposed NADP would be consistent to the maximum extent practicable with the *Bay Plan*, the McAteer-Petris Act and the Coastal Zone Management Act.

6. Endangered Species Act

Section 7 of the Federal Endangered Species Act (FESA) of 1973 protects fish and wildlife species that are listed as threatened or endangered, and their habitats. Federal agencies are required to consult with the US Fish and Wildlife Service (USFWS) to ensure that any action authorized, funded or carried out by the agency does not jeopardize the continued existence of listed species or critical habitat.

In order for a proposed federal action to comply with Section 7 of the Act, a biological assessment (BA) is typically prepared. NASA has prepared a BA that documents the action's expected impacts and proposes mitigation to

compensate for those impacts. Section 78 consultation with the USFWS initiated during the scoping phase for the plan indicated that a formal consultation will be required. The BA would be available to assist the USFWS in continuing to ensure that the Draft Plan and alternatives are in compliance with federal law.

As explained in Sections 3.9 and 4.9, none of the proposed alternatives would impact federally-listed species or their habitat.

7. Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918, administered by the USFWS, makes it unlawful to "take" (i.e., kill, harm, or harass) any migratory bird listed in 50 CFR 10, including their nests, eggs, or products. Migratory birds include geese, ducks, shorebirds, raptors, songbirds, and many others. The Migratory Bird Executive Order of January 11, 2001, directs executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act, and defines the responsibilities of each federal agency taking actions that have or are likely to make, a measurable affect on migratory bird populations. All project actions within NASA must comply with this act; therefore, they cannot result in unauthorized take of migratory birds.

Migratory birds in the study area are described in Section 3.9. Mitigation measures identified in Section 4.9 of this Draft EIS would prohibit disturbance of active nests, protect birds from predation, or ensure that protected bird species that are nesting not be destroyed or disturbed by clearing, construction or demolition activities.

8. National Historic Preservation Act

Section 106 of the NHPA requires that a federal undertaking that could affect a property listed on the National Register of Historic Places (NRHP) or eligible for listing on the register be evaluated, with the participation of preservation agencies and the public. This law requires the agency responsible for the proposed undertaking to take historic properties into account, but it does not prohibit the agency from damaging or destroying the resources.

As described in Section 3.13, the Unitary Plan Wind Tunnel Complex is listed on the NRHP as a historic landmark. A Section 106 survey also led to the listing of the Shenandoah Plaza Historic District on the NRHP. In other Section 106 reviews, a total of three additional structures on the Ames Campus have been nominated for NRHP listing.

Within the Ames Campus, there would be no impacts on any of the buildings listed or eligible for listing on the NRHP. All demolition, rehabilitation, and construction within the Shenandoah Plaza Historic District would be in accordance with Section 106.

9. Archaeological Resources Protection Act

The Archaeological Resources Protection Act of 1979 defines archaeological resources; requires federal permits for excavation; provides for curation of materials, records, and other data; provides for confidentiality of archaeological site locations; and in the 1988 amendment, requires the inventorying of public lands for archaeological resources. In addition, Section 110 of the NHPA specifics that archaeological resources must be taken into consideration before implementing any federal action.

As discussed in Section 3.13, none of the archaeological sites previously recorded at Ames Research Center are considered significant enough to be included in the National Register of Historic Places (NRHP). However, there are several potential archaeologically sensitive areas within Ames Research Center. As discussed in Section 4.13, considerations have been made for dealing with human remains and/or cultural materials that may be found in the process of implementing the NADP. Construction in affected areas would not resume until the regulations of the Advisory Council on Historic Preservation (36 CFR Part 800) had been satisfied.

10. American Indian Religious Freedom Act

The American Indian Religious Freedom Act makes it a policy to protect and preserve for American Indians, Eskimos, Aleuts, and Native Hawaiians their inherent right of freedom to believe, express, and exercise their traditional

religions. The act allows them access to sites, use and possession of sacred objects, and freedom to worship through ceremonial and traditional rights. It further directs various Federal departments, agencies, and other instrumentalities responsible for administering relevant laws to evaluate their policies and procedures in consultation with Native traditional religious leaders to determine changes necessary to protect and preserve Native American cultural and religious practices. Copies of the Draft EIS are being sent to the Amah Tribe of Ohlone Costanoan Indians.

11. Native American Graves Protection and Repatriation Act

The Native American Graves Protection and Repatriation Act of 1990 as amended, outlines the federal government's responsibility for the treatment and ultimate disposition of human burials and grave-related materials. The Act required consultation with certain Native American communities if circumstances regarding human remains, associated artifacts, or objects of cultural patrimony arise. As discussed in Section 4.13, the Native American Heritage Commission would be consulted in the event that human remains are discovered that the Coroner deems are not subject to his or her authority.

12. Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

CERCLA provides a Federal "Superfund" to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Through the Act, the Environmental Protection Agency (EPA) was given power to seek out those parties responsible for any release and assure their cooperation in the cleanup. Federal agencies are not eligible for Superfund dollars, but are required to fund environmental clean-up within their own budget authority.

EPA cleans up orphan sites when potentially responsible parties cannot be identified or located, or when they fail to act. Through various enforcement tools, EPA obtains private party cleanup through orders, consent decrees, and

other small party settlements. EPA also recovers costs from financially viable individuals and companies once a response action has been completed.

EPA is authorized to implement the Act in all 50 states and U.S. territories. Superfund site identification, monitoring, and response activities in states are coordinated through the state environmental protection or waste management agencies.

As noted in Sections 3.7 and 4.7, the Regional Plume is related to the EPA-designated MEW and Naval Air Station Moffett Field Superfund sites under CERCLA. NASA is cooperating fully with the EPA, the MEW companies and the Navy to allow for remediation of the Regional Plume.

13. Solid Waste Disposal Act

Under the Solid Waste Disposal Act, a federal agency disposing of waste at a permitted waste disposal site must comply with all appropriate state and local laws. The California Integrated Waste Management Act of 1989 requires cities and counties to divert solid waste from the waste stream, which can be achieved through a reduction in materials use, reuse, and recycling. Please see discussion under Executive Order 13101 (Waste Reduction) for additional information. As stated in Section 3.6, Ames Research Center has implemented recycling programs to help reduce waste.

NASA has contracts with Southbay Maintenance and Stevens Creek Disposal for solid waste disposal and recycling at Ames Research Center. Waste is disposed of at the Newby Island Landfill in Milpitas. An analysis of solid waste impacts, which is described in Section 4.6, found that there would be no significant impact from the implementation NADP.

C. Compliance with Title 14 of the National Aeronautics and Space Administration Act

The proposed project includes development on floodplain areas within Moffett Field. Therefore, this section evaluates the floodplain impacts associated with the proposed NADP. This evaluation responds to key issues necessary to address the requirements of Title 14, Subpart 1216.2. Section 1216.205(a) of the National Aeronautics and Space Administration Act.

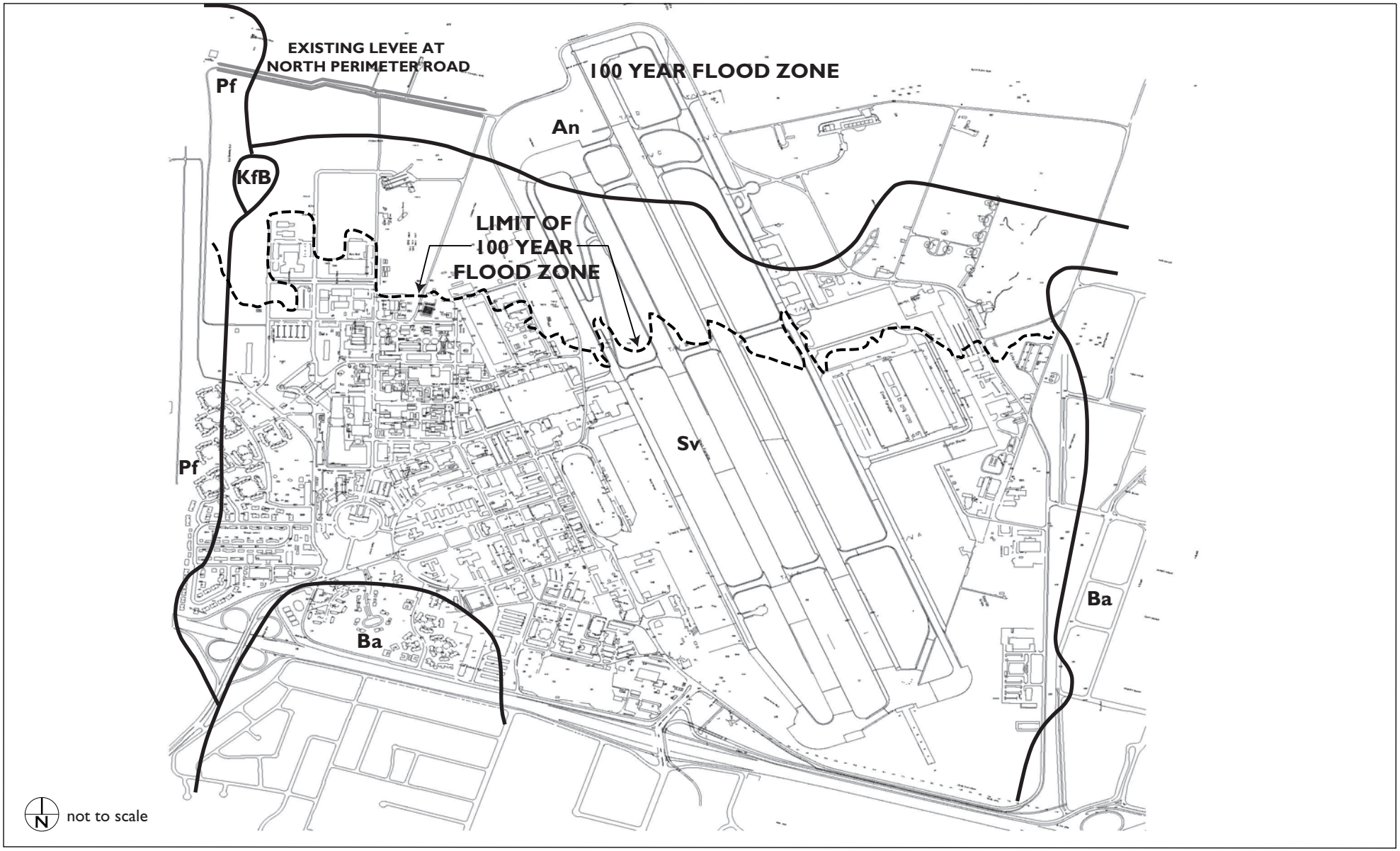
1. Regulatory Background

Title 14, Subpart 1216.2 requires that projects affecting floodplains or wetlands be evaluated relative to potential harm to lives and property, the natural and beneficial values of floodplains and wetlands, and the cumulative impacts of multiple actions over the long term.

The evaluation is to include (1) positive and negative impacts (beneficial and harmful); (2) concentrated and dispersed impacts (impacts on-site, near site and remote from the site); and (3) short and long-term impacts (include temporary changes and those that take the form of delayed changes resulting from the cumulative effects of many individual actions). The purpose is to compare benefits of floodplain improvements, such as health and safety with disbenefits such as loss of open space.

Factors that must be considered include (1) the anticipated design water level, (2) sheet flow depth, (3) flow velocity, (4) groundwater flow and recharge, (5) tidal flow, (6) topography, (7) water quality, (8) vegetation, and (9) aquatic habitats.

Section 1216.204(b) requires that the evaluation be based on the approved floodplain map. The evaluation presented in this FPEIS is based on the 2000 Draft Moffett Field Environmental Resources Document, Soils and Flood Zone Map, shown in Figure 6.5-1. The most current approved floodplain map was prepared in December 1978. The December 1978 map used a lower tidal elevation than the 2000 map and is less conservative for the project areas. The



Source: Figure 12-1, Soils and Flood Zone Map, Moffett Field Environmental Resources Document.

100 Year Flood Zone	-------	Pacheco Loams, Clay Substratum	Pf
Sunnyvale SIte Clay, Drained	Sv		
Bayshore Clay Loam	Ba	Kitchen Middens	KfB
Alviso Clay	An		

FIGURE 6.5-1

SOILS AND FLOOD ZONE MAP

2000 map has been used because it is more recent and uses a more conservative 100-year tidal water level.

2. Rationale for Floodplain Development

Housing is an important component of the overall project. As evidenced by the comment letters presented in Volume 3 of this Final EIS, there is strong support for housing under the NADP. Housing is a required mitigation to address concerns about the jobs/housing imbalance in the area. As part of the NADP, NASA proposes to construct residential housing within the 100-year tidal floodplain limits for Moffett Field. The sites that are not within these limits are not suitable for housing. NASA is limited by where it can locate housing for a number of reasons, including proximity to potentially contaminated sites and incompatible uses, and thus has chosen Bay View, which is within the 100-year floodplain, as the most appropriate location for housing. Some housing is also planned in the NRP. Although NASA plans to mitigate the impacts of site contamination in the NRP so that it does not cause undue risk to the building occupants located over the Superfund plume, the mitigatable risk is not low enough to allow other portions of the NRP to be used for housing. Noise near the wind tunnels and airfield make locations near these facilities inappropriate for housing as well.

At this time NASA does not think it is appropriate to study housing on the east side of Moffett Field since the CANG does not plan to relocate. NASA feels that the Eastside/Airfield is better dedicated to continued use of the airfield as a national and local resource. The golf course on the east side is used as a safety zone for the ordnance storage of the military tenants and therefore it is not an appropriate area for housing.

For the reasons discussed above, NASA has determined that Bay View is the only reasonable and possible location for building the full amount of housing that is required, beyond the amount already provided in the military housing areas and planned for Parcel 6.

3. Existing Floodplain and Wetlands

As shown in Figure 6.5-1, portions of the proposed Bay View Residential Area are within the 100-year tidal floodplain. Portions of the existing Eastside/Airfield and Ames Campus are also within the 100-year tidal floodplain, but all proposed improvements in these two areas are outside of the 100-year tidal floodplain.

As discussed in Section 3.9, there are wetland areas on the Moffett Field site. However, none of these wetland areas is proposed for development. Potential impacts to the wetlands are discussed in Section 4.9. Therefore, no further discussion of wetlands is included here.

4. Alternative Actions

Relative to floodplain impacts, three alternatives were assessed for the proposed project: Alternative 1 (No Project Alternative), Alternative 3, and Alternative 5 (including mitigation). From the perspective of potential impacts to floodplains, Alternatives 2 and 4 are the same as Alternative 5, so are not discussed separately here.

It was determined that Alternative 1 would have no impact on floodplains because no development would occur there. However, Alternative 1 does not meet the goals of the project and does not provide the many benefits that would be provided by the implementation of the Preferred Alternative. Alternative 3 would not result in any change to floodplains. Alternative 3 proposes no development within the Bay View area, which lies in the floodplain zone. While development in Alternative 3 would occur outside the base floodplain, it would not meet NASA's goals for the NADP.

It was determined that Alternative 5 (including mitigation) was the Preferred Alternative because it best met the project objectives while minimizing environmental impacts. This alternative proposes building within the 100-year floodplain limit. This construction would primarily consist of housing. No development would occur in wetlands.

5. Floodplain Impacts of the Preferred Alternatives

The project as proposed under Alternatives 1 and 3 have no significant impacts on the floodplain boundaries delineated from the 2000 Environmental Resources Document Map. Therefore, only the Preferred Alternative is evaluated in detail below.

a. Project Characteristics Relative to Floodplains

As shown in Figure 6.5-2, filling is proposed for the portions of the Bay View residential area that are within the floodplain. Proposed minimum site grades of 7.5 feet would allow a maximum ponding depth of 152 millimeters (6 inches) on roadways during the 100-year tidal event. Building finished floors would be at an elevation of 9.0 feet, at least 305 millimeters (1 foot) above the 100-year tidal water level. Fill that is placed to raise grades above a 100-year tide elevation would not cause changes in tidal water levels at other locations and would not have a cumulative impact.

During major storm events, flooding occurs in the northern portion of Ames Research Center. To reduce the occurrence of flooding, more efficient management of the existing storage available in the stormwater retention pond north of Ames Research Center will be performed. This could be achieved either through the implementation of proactive use of the mobile pumps, which are currently employed in a reactive fashion, or through the installation of a permanent pump station. The permanent pump station is the preferred option for two reasons: (1) the timing and quantity of the discharge from the pump station could be automatically tied to the water level of Stevens Creek, based on the requirements of the Santa Clara Valley Water District; and (2) the residual water level in the stormwater retention pond, after a cycle of pumping had been completed, could be set at a specific elevation based on the preferences of Midpeninsula Regional Open Space District.

As shown on Figure 6.5-1, the levee adjacent to the North Perimeter Road does not isolate the stormwater retention pond from lands south of North Perimeter Road. The ponding in the area north of Bay View during a 100-year storm event is a form of unintentional stormwater detention. Much of this

not to scale

FIGURE 6.5-2

PROPOSED BAY VIEW FILL

Fill

Approximate Location of 100-year Floodplain

ponded water results from runoff that is generated from other portions of Ames Research Center, rather than from Bay View runoff. Placement of fill within Bay View would reduce the total available stormwater detention. The resulting increase in the depth of retained flow in the stormwater retention pond and the area north of Bay View would be minimal.

The potential increase in depth of ponding could be mitigated by more efficient management of the stormwater retention pond. The water level in the retention pond could be pumped down prior to the start of a major storm event to compensate for the decrease in available stormwater storage volume.

With development, there is a potential that increased impervious area would have a detrimental impact on floodplains by decreasing water quality and increasing the volume and peak rate of stormwater runoff. The NADP proposes to mitigate water quality impacts by providing bioswales for the treatment of stormwater runoff. Increases in runoff rates and volumes would be mitigated using measures to maximize pervious surfaces including green roofs and conveyance through bioswales. For the Bay View area, stormwater detention basins would be included to increase potential percolation and reduce peak discharge rates. The stormwater detention basins in the Bay View area would provide roughly 26,760 cubic meters (35,000 cubic yards) of storage.

For the NASA Research Park (NRP) area, stormwater detention is proposed within the piped system to reduce the peak discharge rate. The increased size of the conveyance piping, with restrictive discharge structures, would provide roughly 15,290 cubic meters (20,000 cubic yards) of storage. Because the NRP area is already relatively impervious, no increase in runoff volume is expected with the proposed development. Development within the Eastside/Airfield and the Ames Campus would consist of upgrades to existing facilities, and no floodplain impacts are anticipated.

b. Direct Impacts

The following summarizes the direct impacts that the proposed project, under the Preferred Alternative, would have on the floodplain areas at Moffett Field:

- Design Water Level - With the proposed mitigation measures, there would be no increase in design water level of the tidal flow.
- Overland Sheet Flow - Storm drainage facilities proposed as a part of the proposed NRP project would lead to a reduction in the amount of sheet flow across the site during the 100-year storm event. This would provide a benefit.
- Flow Velocity - Measures are proposed as a part of the project to maintain current flow velocities at the project discharge points.
- Ground Water Flow and Recharge - The site soils consist of clayey materials, including bay mud. These soils have a low permeability. Upper layer groundwater is not potable. Therefore, changes in groundwater recharge would be minor and would not create significant impacts.
- Tidal Flow - The project area is protected from tidal flows by a series of levees. The site would be raised to above the 100-year tide elevation of 8.0.[1] The increase in grades would ensure that no flooding of structures would result from levee failure.
- Topography - Grading would occur to allow for site development and to raise the site above the 100-year tide elevation.
- Water Quality - As explained in Section 4.5, mitigation measures including bioswales and green roofs are proposed to maintain water quality. These are standard accepted water quality measures and would reduce impacts to less-than-significant levels.
- Vegetation - As explained in Section 4.9, there would be no impacts to special-status plants.
- Aquatic Habitats -As explained in Section 4.9, there would be no impacts to aquatic habitats.

[1] San Francisco Bay Tidal Stage vs. Frequency Study, by the US Army Corps of Engineers, October 1984. (Elevations are all given in feet in this floodplain analysis to match Study results.)

c. Cumulative Impacts

With the proposed mitigation measures outlined above, there would be no off-site impact on 100-year tidal water levels, overland sheet flow, flow velocity, groundwater flow and recharge, tidal flow, or water quality associated with the proposed project. As long as other future development adheres to these standards, there would be no adverse cumulative impacts with future development.

6. Additional Information

The proposed project would involve changes in land use. Thus, as recommended by the regulations, this evaluation makes the following additional points:

- The Notices of Availability of the Draft Programmatic EIS and this Final Programmatic EIS have been published in the Federal Register.
- Fill would be required in the Bay View area in order to prevent flooding. Fill would be used to bring the finished grade up to a finished height of 2 meters (7 feet) along the northern edge of the Bay View area, and slope upward to the south to conform to the existing ground at higher elevations. A summary of the fill requirements is provided in the Executive Summary, Section H.2.
- The filling process would not affect natural or beneficial floodplain values.
- Numerous federal, State, local and regional agencies and organizations were involved in the preparation of this EIS. Those that commented on the Draft EIS are listed in Chapter 12, while their comment letters follow in Chapter 13. Individuals who contributed in other ways to the preparation of this EIS are listed in Chapter 8.

7 PREPARERS AND CIRCULATION LIST

This chapter contains a list of, and qualifications for, persons who contributed research and writing to this document; followed by a list of agencies, organizations and businesses who received a Notice of Availability when the Draft and Final EIS were published.

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7.2 LIST OF AGENCIES, ORGANIZATIONS AND BUSINESSES THAT WILL RECEIVE NOTICE OF AVAILABILITY OF THE PUBLIC REVIEW DRAFT EIS

The following agencies, organizations and businesses received a Notice of Availability when the Final EIS was published. All persons who requested a copy of the Draft or Final EIS received one by mail.

A. Federal Agencies

750th Space Group, Onizuka Air Station
7th PsyOp Group
Andrews Air Force Base
Army-Code ARH
BRAC Operations
Council on Environmental Quality
Defense Fuel Supply Point
Department of Housing and Urban Development
Department of Interior-Office of Environmental Policy & Compliance
Federal Aviation Administration
Federal Emergency Management Agency
Moffett Field Fire Department
NASA Ames Research Center
NASA Ames Research Center-SETI
NASA Goddard Space Flight Center
NASA Headquarters
NASA-Code FEF
National Science Foundation
Naval Facilities Engineering Command, South-West Division
Office of Congresswoman Anna Eshoo
Office of Congresswoman Zoe Lofgren
Onizuka Air Station
United States Army Corps of Engineers
United States Army Reserve-63rd RSC
United States Army-787 EOD
United States Congress
United States Department of Commerce
United States Department of Defense

United States Department of Labor
United States Department of the Air Force
United States Department of Transportation
United States Environmental Protection Agency
United States Fish & Wildlife Service
United States Geological Survey
United States Senate

B. State Agencies

Assemblywoman Elaine Alquist
California Air National Guard 129th Rescue Wing
California Conservation Corps
California Department of Fish and Game
California Department of Toxic Substance Control
California Environmental Protection Agency
California State Water Resources Control Board
California Trade & Commerce Agency
Caltrans
Office of Historic Preservation
Office of the Governor
Regional Water Quality Control Board, San Francisco Bay Region
San Jose State University
State Assembly
State Clearinghouse
State Senate
University of California at Santa Cruz
UCSC Extension

C. Regional, County, and Municipal Agencies

Association of Bay Area Governments
Bay Area Air Quality Management District
Bay Conservation and Development Commission
City and County of San Francisco
City of Los Altos
City of Los Altos Hills
City of Mountain View
City of San Jose
City of Sunnyvale
Co Parks CMSN
DeAnza College
Metropolitan Transportation Commission
Midpeninsula Regional Open Space District
Mountain View Chamber of Commerce
Mountain View-Los Altos High School District
Mountain View-Whisman School District
Regional Airport Planning Commission
San Jose International Airport
Santa Clara County
Santa Clara County Assessors
Santa Clara Public Health
Santa Clara Valley Water District
SCC Parks & Recreation
Valley Transportation Authority
Water Transit Authority

D. Organizations

ACM
Acterra
Advocates for Affordable Housing

Alamo Park Association
Alano Club
Alliance for a New Moffett Field
Amah Tribe of Ohlone Costanoan Indians
American Industrial Properties
Bay Area Bioscience Center
Bay Area Economic Forum
Carnegie Mellon University
Colorado State University
Committee for Green Foothills
Communities for a Better Environment
Computer History Museum
Center for Public Environmental Oversight
Greenaction
Greenbelt Alliance
Greenpeace
Institute For Women & Technology
Joint Venture Silicon Valley
KQED-FM
League of Women Voters
League of Women Voters-Bay Area
League of Women Voters-Palo Alto
League of Women Voters-Sunnyvale
Lockheed Martin Properties, Incorporated
Middlefield-Whisman Neighborhood Association
Midpeninsula HC&H
Moffett Field Historical Society
Moffett MAE
Mountain View Chamber of Commerce
Oceanic Society
Pacific Industrial Business Association
Pacific Studies Center
Peninsula Conservation Center
Peninsula Open Space Trust

Podesta.com
San Carlos Airport Pilots Association
San Jose International Airport
Santa Clara County Greenbelt Coalition
Santa Clara Valley Audubon Society
Save the Bay Association
SETI Institute
Sierra Club
Silicon Valley Manufacturing Group
Silicon Valley Toxics Coalition
San Jose Chamber of Commerce
Small Business Specialists
SNAIL
St. Vincent de Paul
Sunnyvale Chamber of Commerce
The Computer Museum History Center
The Tech Museum of Innovation
United States Space Camp
Valley/Bay Care Initiative
Western Disaster Center

E. Businesses

ACCO
Actema
Affymetrix
AMD
AOL/Netscape
Arkenstone (Benetech)
BAE
Basin Research Associates
Calydon
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Carson Geologic & Environmental Consulting
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CLS Associates
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SJIA
Sunnyvale Sun
Sybase
Teculan, Inc.
The Air Show Network
Union Carbide Corporation
USA Ret.
VERITAS Corporation
Westcott Properties

8 BIBLIOGRAPHY

A. Documents Incorporated by Reference

The following documents were used in the preparation of this EIS and are hereby incorporated into the EIS by reference. Copies of these documents are available for review at the following locations:

- City of Mountain View Public Library
- City of Sunnyvale Public Library
- NASA Ames Research Center Visitor Center
- NASA Ames Environmental Services Office, Building 218, Room 203

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B. Additional Documents Cited

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9 GLOSSARY AND ACRONYMS

ABAG: Association of Bay Area Governments.

ACHP: Advisory Council on Historic Preservation.

A-Weighted Sound Level, dBA: The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted, unless reported otherwise.

Ambient Noise Level: The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.

Baseline Emissions: The emissions that would occur without policy intervention (in a business-as-usual scenario). Baseline estimates are needed to determine the effectiveness of emissions reduction programs (often called mitigation strategies).

BCDC: Bay Conservation and Development Commission.

Best Management Practices: Techniques in various land use activities to mitigate or prevent harm to or inhibition of natural attributes or processes.

BOHMP: Burrowing Owl Habitat Management Plan.

Buffer: A strip of land, fence, or border of trees, etc. between one use and another, which may or may not have trees and shrubs planted for screening purposes, designed to set apart one use area from another.

Build out: Development of land to its full potential or theoretical capacity as permitted under current or proposed planning or zoning regulations.

CAC: Citizens Advisory Committee.

CANG: California Air National Guard.

Carbon dioxide (CO2): Colorless, odorless, non-poisonous gas that is a normal part of the ambient air. Carbon dioxide is a product of fossil fuel combustion. Although carbon dioxide does not directly impair human health, it is a greenhouse gas that traps terrestrial (i.e., infrared) radiation and contributes to the potential for global warming.

Census Tract: A small, relatively permanent statistical subdivision of a county in a metropolitan area or a selected non-metropolitan county, delineated by a local committee of census data users for the purpose of presenting decennial census data.

CEQA - California Environmental Quality Act: State law requiring various agencies to document and consider the environmental implications of their actions.

Class I Bikeway (Path): A two-way facility separated from a street or highway for bicycle travel, typically along rail, water or utility corridors.

Class II Bikeway (Lane): A portion of a roadway striped for use by bicycles.

Class II Bikeway (Route): A travelway for bicycles through a community, providing a superior route based on traffic volumes and speeds, street width, directness and cross-street priority, denoted by signs only.

Community Noise Equivalent Level, CNEL: The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.

Comprehensive Plan: A plan for development of an area which recognizes the physical, economic, social, political, aesthetic, and related factors of the community involved.

Contributing Building: A building, site, structure, or object that adds to the historic association, historic architectural quality, or cultural values because it was present during the period of significance, relates to the documented significance of the property, and possesses historic integrity, or is capable of yielding important information about the period.

CRAF: Civil Reserve Air Fleet.

Cultural Resources: Those resources that possess qualities of significance in American, state or local history, architecture, archaeology, and culture present in districts, sites, structures, and objects that possess integrity of location, design, setting, materials, workmanship, congruency, and association.

CUP EA: Comprehensive Use Plan Environmental Assessment.

Day/Night Noise Level, L_{dn}: The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.

Decibel, dB: A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

Drainage: (1) Surface water runoff; and (2) The removal of surface water or groundwater from land by drains, grading, or other means that include runoff controls to minimize erosion and sedimentation during and after construction or development, the means for preserving the water supply, and the prevention or alleviation of flooding.

Easement: A grant by a property owner for the use of land by the public, a corporation, or persons for specific purposes such as the construction of utilities, drainage ways and roadways.

EIMP: Environmental Issues Management Plan.

EIR: Environmental Impact Report. Required under state law (CEQA).

EIS: Environmental Impact Statement. Required under federal law (NEPA).

Endangered Species: A species of animal or plant is considered to be endangered when its prospects for survival and reproduction are in immediate jeopardy from one or more causes.

Equivalent Noise Level, L_{eq}: The average A-weighted noise level during the measurement period.

Floodplain: The land area susceptible to inundation by water as a result of a flood.

Footprint: The horizontal area as seen in plan, measured from outside of all exterior walls and supporting columns.

Frequency, Hz: The number of complete pressure fluctuations per second above and below atmospheric pressure.

General Plan: A city's basic planning document, which provides the blueprint for development throughout the community and is the vehicle through which competing interests and needs of the citizenry are balanced and meshed.

Geographic Information Systems (GIS): A method of storing geographic information on computers. Geographic information can be obtained from a variety of sources, including topographic maps, soil maps, aerial and satellite photos, and remote sensing technology.

Grade: The average level of the finished surface of the ground adjacent to the exterior walls of the building.

Grade, Existing: The vertical elevation of the ground surface prior to excavating or filling.

Habitat: The particular living place which provides an environment suitable for survival of an organism, a species or a community.

Hazardous Waste: Any refuse or discarded material or combinations of refuse or discarded materials in solid, semisolid, liquid, or gaseous form which cannot be handled by routine waste management techniques because they pose a substantial present or potential hazard to human health or other living organisms because of their chemical, biological, or physical properties.

Historic Preservation: The preservation of historically significant structures and neighborhoods in order to facilitate restoration and rehabilitation of the building(s) to a former condition.

Historic Structure: Any structure that is (a) listed in the National Register of Historic Places or is eligible for individual listing on the National Register; (b) certified or preliminarily determined by the Secretary of the Interior as contributing to the historical significance of a registered historic district or a district preliminarily determined by the Secretary to qualify as a registered historic district; or (c) designated by the city as a heritage preservation site.

HRPP: Historic Resources Protection Plan.

Infill: Development or redevelopment of land that has been bypassed, remained vacant, and/or is underused as a result of the continuing urban development process.

Jobs/Housing Balance: The availability of affordable housing for employees.

Jobs/Housing Ratio: The jobs/housing balance divides the number of jobs in an area by the number of employed residents. A ratio of 1.0 indicates a balance. A ratio greater than 1.0 indicates a net in-commute; less than 1.0 indicates a net out-commute.

L_{dn} (Day/Night Noise Level): The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.

L_{max}, L_{min}: The maximum and minimum A-weighted noise level during the measurement period.

L_{01}, L_{10}, L_{50}, L_{90}: The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.

LAFCO: Local Agency Formation Commission. A state agency that works in an individual county with the authority to set the boundaries and Spheres of Influence of local agencies such as cities and special districts.

Level of Service (LOS) standard, traffic: A scale that measures the amount of traffic that a roadway or intersection can accommodate, based on such factors as maneuverability, driver dissatisfaction, and delay.

LOS A: Indicates a relatively free flow of traffic, with little or no limitation on vehicle movement or speed.

LOS B: A steady flow of traffic, with only slight delays in vehicle movement and speed

LOS C: A reasonably steady, high-volume flow of traffic, with some limitations on vehicle movement and speed, and occasional backups on critical approaches.

LOS D: Designates where the level of traffic nears an unstable flow. Intersections still function but short queues develop and cars may have to wait through one cycle during short peaks.

LOS E: Traffic characterized by slow movement and frequent (although momentary) stoppages. This type of congestion is considered severe, but is not

uncommon at peak hours, with frequent stopping, longstanding queues, and blocked intersections.

LOS F: Represents unsatisfactory stop-and-go traffic characterized by "traffic jams" and stoppages of long duration. Vehicles at signalized intersections usually have to wait through one or more signal changes, and "upstream" intersections may be blocked by the long queues.

MIP: Mitigation Implementation Plan. Describes who will implement each mitigation measure, how it will be implemented, and when it will be implemented. Prepared before the Record of Division (ROD) is signed.

Mitigation: Measures taken to eliminate or minimize damages from development activities by replacement of the resource or other means of compensation.

NADP: NASA Ames Development Plan.

National Register of Historic Places: The listing maintained by the US National Park Service of areas that have been designated as historically significant.

Neotraditional Development: An approach to land use planning and urban design that promotes the building of neighborhoods with a mix of uses and housing types, architectural variety, a central public gathering place, interconnecting streets and alleys, and edges defined by greenbelts or boulevards. The basic goal is integration of the activities of potential residents with work, shopping, recreation, and transit all within walking distance.

NEPA - National Environmental Policy Act: Federal law requiring agencies to document and consider the environmental implications of their actions.

Nitrogen Oxides (NOx): Gases consisting of one molecule of nitrogen and varying numbers of oxygen molecules. Nitrogen oxides are produced, for

example, by the combustion of fossil fuels in vehicles and electric power plants. In the atmosphere, nitrogen oxides can contribute to formation of photochemical smog, impair visibility, and have health consequences; they are considered pollutants.

Nonattainment: The condition of not achieving a desired or required level of performance. Frequently used in reference to air quality.

NRP: NASA Research Park.

OARF: Outdoor Aerodynamic Research Facility.

Open Space: Land and water areas retained for use as active or passive recreation areas or for resource protection in an essentially undeveloped state.

Ozone: A colorless gas with a pungent odor, having the molecular form of O_3, found in two layers of the atmosphere, the stratosphere (about 90 percent of the total atmospheric loading) and the troposphere (about 10 percent). Ozone is a form of oxygen found naturally in the stratosphere that provides a protective layer shielding the Earth from ultraviolet radiation's harmful health effects on humans and the environment. In the troposphere, ozone is a chemical oxidant and major component of photochemical smog. Ozone can seriously affect the human respiratory system.

Programmatic Agreement (PA): A framework for ensuring site artifacts are identified and assessed for interpretive or educational value. It is a document that records the terms and conditions agreed upon to resolve the potential adverse effects of a Federal agency program, complex undertaking or other situations in accordance with Sec. 800.14(b).

Particulate Matter (PM): Solid particles or liquid droplets suspended or carried in the air (e.g., soot, dust, fumes, mist).

Pollutant: Any introduced gas, liquid, or solid that makes a resource unfit for its normal or usual purpose.

Remediation: The action or measures taken, or to be taken, to lessen, clean-up, remove, or mitigate the existence of hazardous materials existing on the property to such standards, specifications, or requirements as may be established or required by federal, state, or county statute, rule, or regulation.

ROD: Record of Decision. The signed document that adopts the preferred alternative described in the EIS, and commits NASA and its partners to implementation of the mitigation measures.

Section 106: Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of their actions on historic properties and seek comments on their actions from an independent reviewing agency.

Sphere of Influence: A planning tool used by cities to identify the potential future municipal boundary. In most cases, the sphere includes the area just beyond a city's boundary and includes territory and neighborhoods surrounding the city. A sphere allows cities to plan in cooperation with other agencies for public services such as police, fire, parks, roads, and flood control. LAFCOs designate Spheres of Influence based on the identification of the probable ultimate boundaries of each city.

State Historic Preservation Officer (SHPO): the official appointed or designated pursuant to section 101(b)(1) of the NHPA to administer the State historic preservation program or a representative designated to act for the State historic preservation officer.

Sustainability: Community use of natural resources in a way that does not jeopardize the ability of future generations to live and prosper.

Traffic Impact: An increase in congestion, worsening of level of service, or reduction in safety or efficiency.

Traffic Impact Analysis: An analysis of the effect of traffic generated by a development on the capacity, operations, and safety of the public street and highway system.

Transportation Demand Management (TDM): The implementation of programs, plans or policies designed to encourage changes in individual travel behavior. TDM can include alternatives to the single occupant vehicle such as carpools, vanpools, bicycles, transit, reduction or elimination of the number of vehicle trips, or shifts in the time of vehicle commutes to other than the peak period.

Tree Preservation: (1) Retaining an existing tree on site. (2) An orientation to provide for maximum tree coverage on site by retaining existing trees, especially those of high value, rather than by replanting, or a combination.

Tree Protection: Measures taken, such as, but not limited to, temporary fencing and the use of tree wells, to protect existing trees from damage or loss during and after project construction.

Trip Generation: The dynamics that account for people making trips in automobiles or by means of public transportation. Trip generation is the basis for estimating the level of use for a transportation system and the impact of additional development or transportation facilities on an existing, local transportation system.

USFWS: United States Fish and Wildlife Service.

VTA: Santa Clara Valley Transit Authority.

Wetlands: Habitats where the influence of surface or groundwater has resulted in development of plant or animal communities adapted to aquatic or intermittently wet conditions. Wetlands include tidal flats, shallow subtidal areas, swamps, marshes, wet meadows, bogs, and similar areas.

Zoning: The division of a city into districts and the application of different regulations in each district.

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11 INTRODUCTION TO RESPONSES TO COMMENTS

This third volume of the NASA Ames Development Plan Final Programmatic EIS responds to comments received on the Draft Programmatic EIS (DPEIS). This chapter provides an overview of the responses to comments and the environmental impact review process.

A. Purpose and Overview of Volume Three

Volume 3 of this Final Programmatic EIS has been prepared as an addition to the DPEIS for the NASA Ames Development Plan (NADP). As required by National Environmental Policy Act (NEPA), a Final EIS must contain responses to all substantive comments received during the public review period for a Draft EIS. A list of commentors on the NADP DPEIS is presented in Chapter 12. Copies of all written comments received are reproduced in Chapter 13, as are the transcripts of the public comment portions of each public hearing. In addition, responses to all comments are presented in Chapter 13. Where a response requires revisions to the DPEIS, these revisions have been incorporated into Volumes 1 and 2 of the Final Programmatic EIS and/or the appendices, and are referenced by page number in the responses to comments.

B. Environmental Review Process

According to NEPA, lead agencies are required to consult with federal agencies that have jurisdiction by law or special expertise on the proposed action. In addition, the Council of Environmental Quality NEPA Guidelines encourage federal agencies to identify state and local cooperating agencies that have jurisdiction by law or special expertise on the proposed action. As well, they are required to solicit appropriate information from the public during EIS preparation. After completion of the Draft EIS, the lead agency must provide public notice of the availability of the Draft EIS to interested persons and agencies. These agencies and individuals are welcome to submit comments on the Draft EIS during the public review period, which must be at least a 45-day period. A Final EIS is prepared to respond to those comments received on the

Draft EIS and to clarify any errors, omissions, or misinterpretation of discussion of findings in the Draft EIS.

The DPEIS for the NADP project was made available for public review on November 26, 2001. The DPEIS was distributed to federal, local and State responsible and trustee agencies. The general public was advised of the availability of the DPEIS through public notice as required by law. Federal Register notices were published by NASA on November 26, 2001 and on December 10, 2001 by EPA. In addition, notices were published in the San Jose Mercury News (November 25 and December 2, 7 and 9, 2001), the La Oferta Review (November 30 and December 7, 2001), the Sunnyvale Sun (December 5, 2001), the Mountain View Voice and the Palo Alto Daily News (November 28 and 30, 2001). A meeting was held to brief Ames employees and to obtain comments on December 3, 2001. Public meetings to receive comments on the DPEIS were held on December 10, 11, 12 and 13, 2001 at Ames Research Center, the City of Sunnyvale and the City of Mountain View. The public comment period on the NADP DPEIS was extended for five days beyond the mandated 45-day period, closing on January 28, 2002.

The Final EIS must also be distributed to federal agencies with jurisdiction by law or special expertise, state and local cooperating agencies, environmental regulatory agencies, and those requesting copies.

Not sooner than thirty days after the Final EIS is published, a Record of Decision can be prepared. This is a written record explaining why the lead agency has taken a particular course of action, identifying what the action is, and the mitigations the agency is committing to.

12 LIST OF COMMENTORS

A. Written Comments

Federal Agencies

1. Lawrence Lansdale, Acting BRAC Environmental Coordinator-Moffett Field/NTC Southwest Division, Naval Facilities Engineering Command, January 24, 2002.
2. Lisa Hanf, Manager, Federal Activities Office, United States Environmental Protection Agency, January 25, 2002.
3. Sandra Finan, Lt Col, USAF Commander, 21st Space Operations Squadron, Department of Air Force, January 28, 2002.
4. Pedro Sobrino, Major, CA ANG, Executive Officer, Department of Air Force, January 28, 2002.

State Agencies

5. Guenther W. Moskat, Chief, Planning and Environmental Analysis Section, Department of Toxic Substances Control, December 19, 2001.
6. State Clearinghouse, Governor's Office of Planning and Research, State of California, December 21, 2001.
7. Dale Bowyer, Section Leader, Alameda-Santa Clara Watershed Section, California Regional Water Quality Control Board, January 24, 2002.
8. Robert W. Floerke, Regional Manager, Central Coast Region, Department of Fish and Game, January 28, 2002.
9. Barbara J. Cook, P.E., Chief, Northern California - Coastal Cleanup Operations Branch, Department of Toxic Substances Control, January 28, 2002.
10. Randell H. Iwasaki, Acting District Director, Department of Transportation, January 28, 2002.
11. R. Michael Tanner, Interim Director, U.C. Silicon Valley Center, University of California, Santa Cruz, January 28, 2002.

12. Robert W. Floerke, Regional Manager, Central Coast Region, Department of Fish and Game, February 7, 2002.

Regional, County and Municipal Agencies

13. Frederik M. Fowler, Mayor, City of Sunnyvale, December 19, 2001.
14. Ann Draper, Planning Director, County of Santa Clara, January 17, 2002.
15. Frederik M. Fowler, Mayor, City of Sunnyvale, January 17, 2002.
16. Ralph G. Tonseth, Director of Aviation, San Jose International Airport, January 22, 2002.
17. Thomas G. Bertken, CEO, Water Transit Authority, January 28, 2002.
18. L. Craig Britton, General Manager, Midpeninsula Regional Open Space District, January 28, 2002.
19. Chris Brittle, RAPC Staff Liaison, Regional Airport Planning Committee, January 28, 2002.
20. Joseph Horwedel, Acting Director, Planning, Building and Code Enforcement, City of San Jose, January 28, 2002.
21. Sally J. Lieber, Mayor, City of Mountain View, January 28, 2002.
22. Roy Molseed, Senior Environmental Planner, Santa Clara Valley Transit Authority, January 28, 2002.
23. Jeffry Blanchfield, Chief Planner, San Francisco Bay Conservation and Development Commission, February 8, 2002.

Corporations and Non-Profit Organizations

24. Peter M. Strauss, Technical Advisor, Silicon Valley Toxics Coalition, January 22, 2002.

25. Ray G. Hayter, Chair, Advocates for Affordable Housing, January 23, 2002.
26. Vanya Sloan, President, League of Women Voters, Los Altos-Mountain View, and Tamra C. Hege, President, League of Women Voters of the Bay Area, January 23, 2002.
27. Ryan Broddrick, Director of Conservation, Valley/Bay CARE Initiative, January 24, 2002.
28. Jim Fruchterman, President and CEO, Benetech, January 27, 2002.
29. David Smernoff, Executive Director, Acterra, January 27, 2002.
30. Kelly R. Crowley, Environmental Advocate, Santa Clara Valley Audobon Society, January 28, 2002.
31. David Lewis, Executive Director, Save the Bay, January 28, 2002.
32. Lenny Siegel, Secretary, Alliance for a New Moffett Field, January 28, 2002.
33. John Toole, Executive Director and CEO, Computer History Museum, January 28, 2002.

Private Individuals

34. Leonid Rappoport, Mountain View, December 10, 2001.
35. John Gould, December 11, 2001.
36. Margaret Okuzumi, December 13, 2001.
37. Michael Schuh, December 13, 2001.
38. Daniel Dugan, January 3, 2002.

39. Brian Allen, San Francisco, January 18, 2002.[1]
40. James Gonsman, San Rafael, January 18, 2002.
41. Bette Kiernan, Palo Alto, January 18, 2002.
42. Bob Rogers, January 18, 2002.
43. Gloria McClain, January 19, 2002.
44. Jack Schoop, Santa Rosa, January 19, 2002.
45. Paul Denton, January 20, 2002.
46. Mary Markus, January 20, 2002.
47. June Swan, January 20, 2002.
48. Frederick Willsea, January 20, 2002.
49. P. da Silva and D. Hodapp, January 21, 2002.
50. Susan Ford, January 21, 2002.
51. Ernest Goiten, Atherton, January 21, 2002.
52. Gordon Bennett, Muir Beach, January 22, 2002.
53. Rich Scholz, January 22, 2002.
54. Nancy Barnby, Menlo Park, January 23, 2002.
55. Milt Schwartz, Mountain View, January 23, 2002.
56. George Bartleson, January 24, 2002.
57. Robert Erdman, Sunnyvale, January 24, 2002.

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[1] This is the first of 53 letters referred to in this document as the "Save The Bay" campaign letters. All of these letters have essentially indentical contents, and hence are not individually reprinted in the Final Programmatic EIS. The letter from Mr. Allen is included here among the "private individuals" and is responded to individually in Chapter 13. All remaining campaign letters are listed in Chapter 12 only and are not responded to individually in Chapter 13.

58. Bernadine Frank and Hannah Liebmann, Mountain View, January 24, 2002.
59. Elizaharp2@aol.com, January 24, 2002.
60. Ronald Lambert, San Jose, January 24, 2002.
61. George Raiche, January 24, 2002.
62. Sameet Mehta, Cisco Systems, January 24, 2002.
63. Norton Bell, January 25, 2002.
64. Maxine Eggerth, January 25, 2002.
65. Andrew Fenselau, Mountain View, January 25, 2002.
66. Kevin Jackson, January 25, 2002.
67. Eileen Menteer, Mountain View, January 25, 2002.
68. Joe Altimus, January 28, 2002, 2002.
69. Stephen Brown, El Cerrito, January 28, 2002.
70. John Gordon, January 28, 2002.
71. Libby Lucas, Los Altos, January 28, 2002.
72. Molly Molloy, Mountain View, January 28, 2002.
73. David Simons, January 28, 2002.
74. Stephanie Munoz, Palo Alto, January 28, 2002.
75. Jeff Segall, Mountain View, January 28, 2002.
76. Charles Wallin, Sunnyvale, February 1, 2002.
77. William Garrett, San Jose, no date.
78. Cecilia and James Keehan, Mountain View, January 27, 2002 (received February 12, 2002).

Save The Bay Campaign Letters

The following individuals submitted campaign letters in association with Save The Bay:

79. Russell Blalack, Cupertino, January 18, 2002.
80. Richard Bloom, Santa Rosa, January 18, 2002.
81. Michael Klusek, January 18, 2002.
82. Timothy Martin, Woodside, January 18, 2002.
83. Claire Perricelli, Napa, January 18, 2002.
84. Stephanie Quick, Pleasant Hill, January 18, 2002.
85. Wendy Richards, January 18, 2002.
86. Alpha Schram, Oakland, January 18, 2002.
87. Melvin Brown, San Mateo, January 19, 2002.
88. Amigo Cantisano, North San Juan, January 19, 2002.
89. David Crabbe, San Carlos, January 19, 2002.
90. Joyce and James Hendry, January 19, 2002.
91. Jone Small Manoogian, Palo Alto, January 19, 2002.
92. Joe McKenzie, El Cerrito, January 19, 2002.
93. Manuel Preito, January 19, 2002.
94. Bob and Liz Stone, Yountville, January 19, 2002.
95. Mark Swoiskin, January 19, 2002.
96. Mike Vandeman, January 19, 2002.
97. Natalie Zarchin, January 19, 2002.
98. Lance Funston, January 20, 2002.
99. Natalia Almeida, January 20, 2002.

100. JB, Minneapolis, MN, January 20, 2002.
101. Ted W. Kraynick, San Jose, January 20, 2002.
102. John Schinnerer, Albany, January 20, 2002.
103. Joel and Laine Barbanell Schipper, San Francisco, January 20, 2002.
104. Lawrence Stark, M.D., Berkeley, January 20, 2002.
105. Lloyd and Sheila Andres, Berkeley, January 21, 2002.
106. Tom Camara, Mill Valley, January 21, 2002.
107. Michael Gallagher, Mill Valley, January 21, 2002.
108. Alan Goggins, Castro Valley, January 21, 2002.
109. Patricia Kaspar, San Mateo, January 21, 2002.
110. Alisa Greene MacAvoy, Redwood City, January 21, 2002.
111. Patricia Smith, Oakland, January 21, 2002.
112. Wendy Dreskin, San Anselmo, January 22, 2002.
113. Jason Moses, January 22, 2002.
114. Jonathan Olson, San Diego, January 22, 2002.
115. Rick Peterson, Menlo Park, January 22, 2002.
116. Margaret Spak, Menlo Park, January 22, 2002.
117. Jennifer Chu, Mountain View, January 23, 2002.
118. Michael Dorman, San Diego, January 23, 2002.
119. Jonathan Olson, January 23, 2002.
120. Jessica Fox, San Carlos, January 24, 2002.
121. Mary McVey Gill, January 24, 2002.
122. Margaret Niles, January 24, 2002.
123. Jordan Rinker, Corte Madera, January 24, 2002.

124. Ron and Elsa Bernhardt, Livermore, January 26, 2002.
125. Mary Ellen Hasbrouck, Mountain View, January 26, 2002.
126. Edward and Mary Etta Moose, and Samuel Deitsch, January 26, 2002.
127. Stephanie Schaaf, Mountain View, January 28, 2002.
128. Gary and Veronica Reed, Novato, January 29, 2002.
129. Tom Gaman, Inverness, February 11, 2002.
130. Dr. Roger Rosenberg, San Jose, February 13, 2002.

B. Public Hearing Comments

A series of five public hearings were held on the Draft Programmatic EIS in December 2001. The meeting dates and locations are listed below, along with the names of individuals who submitted comment cards or speaker cards at each meeting.

Additional speakers made comments at some of the meetings, but did not identify their names, and are therefore not included in the list below. However, comments from these anonymous commentors do receive responses in Chapter 13.

NASA Ames Research Center, Monday, December 3, 2001.

1. Pamela Davoren, Lockheed Martin
2. Daniel Dugan, NASA
3. Peter Goldsmith, NASA, FEF
4. Kevin Jackson
5. Laura Lewis
6. Don Reynolds, NASA

7. Michael Rogers, NASA
8. Michael Rutkowski, US Army
9. Michael Schwartz
10. Will Taylor

NASA Ames Research Center, Monday, December 10, 2001.

1. Gus Anderson, Military
2. S.E. Wahlers
3. Susan Smith, Military
4. Chaplain Walls, US Army

NASA Ames Research Center, Visitor's Center, Tuesday, December 11, 2001.

1. Thom Bryant, Network Alliance
2. Achilles Chua
3. John Gould, Experimental Aircraft Association
4. Robert Lenox
5. Randy Miller
6. Ted Scarlett
7. Lenny Seigel
8. Jay White, California Pilots Association

Mountain View City Council Chambers, Wednesday, December 12, 2001.

1. Mark Christenson, Mountain View

2. Philip Cosby, Peninsula Interfaith Association
3. Erica Kara Gouni
4. L. Paul
5. Allison Lasser, Peninsula Interfaith Association
6. Libby Lucas
7. Briggs Nisbet, Save The Bay
8. Cynthia Paton, Save The Bay
9. Jeffrey Plaza, US Army
10. Lenny Seigel
11. Stan Smith

Sunnyvale City Council Chambers, Thursday, December 13, 2001.

1. Doug DeLong
2. Zachary Goldberg, County of Santa Clara
3. Thom Mayer
4. Margaret Okuzumi
5. Ken Sauer, Sunnyvale Restaurant
6. Gary Schilling, Bar Architects

13 COMMENTS AND RESPONSES

This chapter includes a reproduction of, and responses to, each letter received during the public review period. Each letter is reproduced in its entirety, and is immediately followed by responses to the comments in it. Letters are categorized by type of commentor, with Federal agencies first, State agencies second, regional, county and municipal agencies third, corporations and non-profit organizations fourth, and private individuals last. Within each category, letters are arranged in chronological order by the date sent. Each comment and response is labeled with a reference number in the margin.

This chapter does not contain reproductions of the 53 campaign letters received from supporters of Save The Bay. Rather, only the first of these letters is reproduced and responded to. This letter appears as Letter 39. A list of individuals who submitted a Save The Bay campaign letter is provided in Chapter 12.

In addition, this chapter includes responses to comments received at the public hearings on the Draft Programmatic EIS (DPEIS), which were held on December 3, 10, 11, 12, and 13, 2001 at various locations at Ames Research Center and in the Cities of Sunnyvale and Mountain View. The public comment portions of hearing transcripts are reproduced chronologically in this chapter. Each transcript is followed by responses to comments made during the hearing.

Where the same comment has been made more the once, a response may direct the reader to another numbered comment and response. Where a response requires revisions to the DPEIS, these revisions have been incorporated into the Final Programmatic EIS.

From: "Lansdale, Lawrence L (EFDSW)" <LansdaleLL@efdsw.navfac.navy.mil>
To: "'researchpark@arc.nasa.gov'" <researchpark@arc.nasa.gov>
Cc: "Sandy Olliges (E-mail)" <solliges@mail.arc.nasa.gov>,
"Gromko, David S (EFDSW)" <GromkoDS@efdsw.navfac.navy.mil>
Subject: Comments to NASA EIS
Date: Thu, 24 Jan 2002 16:12:53 -0800

Ms. Sandy Olliges;

Thank you for the opportunity to comment on the NASA Ames Development Plan Draft Programmatic Environmental Impact Statement (EIS) dated November 2001. Although the Navy has transferred the property to NASA, the Navy is interested how the proposed development will impact on-going remediation efforts. The following comments were identified in review of the EIS: I-1

* Subsurface utilities are proposed within areas that may contain subsurface contamination. Preferential pathways, pipeline infiltration, and excavation of contamination should be minimized by locating subsurface utilities near the surface in non-contaminated areas. I-2

* The proposed storm drain system appears to be contrary to storm water practice. Infiltration galleries and permeable surfaces should be considered to supplement the existing storm drainage system. Installation of large diameter pipes (up to 60") should be further evaluated. These proposed pipes may be a conduit to spread contamination since they will likely be located below the water table within contaminated soil and groundwater. I-3

Thank you for the opportunity of comment on this EIS.

Lawrence Lansdale, PE
Acting BRAC Environmental Coordinator-Moffett Field/NTC
Southwest Division
Naval Facilities Engineering Command
Base Realignment and Closure Operations ATTN: Lawrence Lansdale (Code: 06CH.LL)
1230 Columbia Street, Suite 1100
San Diego, CA 92101-8517
Ph: 619-532-0961
Fax: 619-532-0995

LETTER 1

Lawrence Lansdale, Acting BRAC Environmental Coordinator-Moffett Field/NTC Southwest Division, Naval Facilities Engineering Command, January 24, 2002.

1-1: The development proposed under the NADP would not impede on-going remediation efforts at Ames Research Center (ARC). The incorporation of the remediation into the construction effort required for the NADP is described in detail in the *Draft Environmental Issues Management Plan* (EIMP) prepared by EKI, dated December 2001.

1-2: In general terms, NASA is addressing issues related to subsurface utilities as follows:

- Preferential Pathways - All utilities would be constructed using trench cut-off walls and low permeable backfill.
- Pipeline Infiltration - Wet gravity and pressure utilities would be constructed using butt-fusion welded High Density Polyethylene.
- Minimize Excavation - Dry utilities and wet pressure utilities would be installed at the minimum depth required to maintain the integrity of the pipe or conduit. At crossings, the option of going over gravity utilities by installing shallow concrete encased pipe or conduit to avoid going deep under gravity lines would be utilized when feasible.

These measures are described in detail in the Draft EIMP prepared by EKI.

1-3: Infiltration is unlikely to be entirely effective as a means to minimize storm runoff due to the high water table and clayey soil at ARC. As described in Chapter 2, the design elements of permeable pavement, directing runoff from rooftops and parking lots through grassy swales prior to entering the storm drain system would be incorporated into the development of the individual sites. Further detailed design would

be done prior to construction. However, large diameter pipes may still be necessary to remove storm runoff quickly enough from the surface to prevent flooding. The system, however, would be designed to convey runoff slowly to the Storm Water Retention Pond, thereby limiting the discharge flow to pre-project levels. As described in the response to Comment 1-2, measures are proposed that would prevent the spread of contaminants via storm drain or other utility pipes or trenches.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

January 25, 2002

Sandy Olliges (mailstop: 218-1)
NASA Ames Research Center
Moffett Field, CA 94035

Dear Ms. Olliges:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Programmatic Environmental Impact Statement (DPEIS) for the **NASA Ames Development Plan, Santa Clara County, California** (CEQ #010502. #D-NAS-K12008-CA). Our comments on the DPEIS are provided under the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementing Regulations (40 CFR 1500-1508), and Section 309 of the Clean Air Act (CAA).

The DPEIS was prepared by the National Aeronautics and Space Administration (NASA) to analyze the environmental consequences associated with a variety of mixed-use developments under the proposed NASA Ames Development Plan (NADP). The proposal is designed to bring new research and development uses to NASA's Ames Research Center (ARC). The proposed study area is approximately 1,500 acres, almost all of the land under NASA's control within the ARC. The DPEIS evaluates five alternatives: Alternative 1 (No Project) and four development scenarios (Alternatives 2-5) proposing various mixes of new educational, office, research and development, light industrial, museum, conference center, housing, and retail developments, including demolition or renovation of existing facilities at the project site. Alternative 5 is NASA's preferred alternative. **2-1**

EPA's review finds the DPEIS to be a comprehensive document which includes an extensive array of mitigation measures. We note that the DPEIS indicates that the project is in conformity with Section 176 of the CAA (for criteria air pollutants), and are pleased to find NASA's air quality mitigation measures (AQ-1 through AQ-6a). However, the DPEIS also acknowledges that construction activities associated with all of the action alternatives would result in emissions exceeding the thresholds of significance for oxides of nitrogen (NOx) and particulate matter less than 10 microns in diameter (PM10), as established by the Bay Area Air Quality Management District. EPA thus has environmental concerns associated with the project's impacts to air quality and health, and believes that, under NASA's direction and leadership, additional air quality mitigation measures can potentially reduce impacts. **2-2**

Given the project's construction period lasting 10 years or more, we encourage NASA to build upon the numerous air quality mitigation measures presented in the DPEIS in order to achieve additional reductions in project-related emissions from construction equipment, which, according to the DPEIS, account for more than 80% of the total construction period emissions of reactive organic gases, NOx, and carbon monoxide (DPEIS, Volume 2, p. 4.4-2). In our detailed comments (attached), EPA provides recommendations to further improve and strengthen NASA's air quality mitigation measures. EPA is available to work with NASA in this regard. **2-2**

Based upon our review, we have assigned a rating of EC-2, Environmental Concerns - Insufficient Information. Please refer to the attached "*Summary of Rating Definitions*" for further details on EPA's rating system. Please refer to our attached comments for further explanation of our air quality concerns. **2-3**

We appreciate the opportunity to comment on the DPEIS. Please send one copy of the Final PEIS (FPEIS) when it is filed with EPA's Washington, D.C. office. If you have any questions, please contact my staff reviewer for this EIS, David Tomsovic, at 415-972-3858.

Sincerely,

Lisa B. Hanf

Lisa B. Hanf, Manager
Federal Activities Office

Attachments: 2
"*Summary of Rating Definitions*"
EPA's detailed comments on DPEIS

cc: Mr. Henry Hilken, Bay Area Air Quality Management District, San Francisco
Mr. Ralph G. Tonseth, Director of Aviation, San Jose International Airport

SUMMARY OF EPA RATING DEFINITIONS

This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the EIS.

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

ADEQUACY OF THE IMPACT STATEMENT

Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

U.S. EPA comments on Draft Programmatic Environmental Impact Statement (DPEIS) - National Aeronautics and Space Administration (NASA) Ames Research Center, NASA Ames Development Plan - January 25, 2002

AIR QUALITY

Mitigation to Reduce Emissions During Construction

The DPEIS documents the project's construction activities, stating that "emissions from heavy-duty construction equipment account for over 80 percent of the total construction period emissions" of reactive organic gases (ROG), oxides of nitrogen (NOx), and carbon monoxide (CO) (Volume II, p. 4.4-2). EPA notes the statement that NASA's "preliminary calculations" indicate that construction associated with all of the action alternatives would result in emissions that exceed the Bay Area Air Quality Management District's (BAAQMD) significance thresholds for NOx and PM10 (particulate matter less than 10 microns in diameter) (Volume II, p. 4.4-29). The DPEIS provides several important mitigation measures addressing the potential reduction of construction-related emissions of NOx and diesel particulate matter (PM), including properly maintaining construction equipment; evaluating the use of available alternative diesel fuels; reducing construction-related traffic trips and unnecessary idling of equipment; and using newer, "cleaner" construction equipment (DPEIS, p. 0-19, mitigation measure AQ-6b).

NASA's proposed air quality mitigation measures are excellent proposals to reduce emissions from diesel fuel combustion during construction. EPA commends NASA's environmental leadership in proposing the air quality mitigation in Volume I (Table 0-1, *Summary of Impacts and Mitigation Measures*).

2-4

To further reduce the environmental impacts associated with diesel PM and NOx emissions, EPA recommends that the Final Programmatic EIS (FPEIS) assess the feasibility of installing control equipment on diesel construction equipment and adopting a "Construction Emissions Mitigation Plan" (CEMP) to further define the proposed mitigation measures and better ensure that potential impacts are successfully reduced or avoided. EPA recommends implementing an adaptive mitigation measure for potential air quality impacts over the project's 10-year construction phase, and modifying NASA's mitigation measure to use "cleaner" construction equipment, where possible.

- Recommended Mitigation for Control Equipment on Diesel Construction Equipment

  An effective method to reduce diesel PM and other pollutants is to install appropriate control technology on construction equipment. Installing particulate traps, oxidation catalysts and other appropriate control devices may be limited by various factors, but that should not necessarily preclude NASA from requiring control devices to the greatest extent that is technically feasible. Accordingly, EPA requests that the FPEIS address if appropriate control equipment is suitable and available over the 10+ years of the project's construction. A particulate filter ("P-trap" or oxidizing soot filter) may control approximately 80 percent of diesel PM emissions. An oxidation catalyst reduces PM

emissions by only 20 percent, but can reduce CO emissions by 40 percent, and hydrocarbon emissions by 50 percent. Different control devices may be used simultaneously.

▸ Recommended "Construction Emissions Mitigation Plan"

A "Construction Emissions Mitigation Plan" (CEMP) would help to ensure that the procedures for implementing all proposed mitigation measures are sufficiently defined to ensure a reduction in the environmental impact from diesel PM and NOx due to the project's construction. EPA encourages NASA to address the feasibility of a CEMP in its FPEIS and, as appropriate, include a commitment to adopt a CEMP in its Record of Decision. The recommended CEMP could integrate several provisions to protect air quality, such as one to ensure that heavy equipment is properly maintained at all times. The recommended CEMP could ensure that all construction-related engines are tuned to the engine manufacturer's specifications in accordance with the time frame recommended by the engine manufacturer; not idle for more than five minutes; not tampered with in order to increase engine horsepower; include particulate traps, oxidation catalysts and other suitable control devices on all construction equipment used at the construction site; and use diesel fuel having a sulfur content of 15 ppm or less, or other suitable alternative diesel fuel, unless such fuel cannot be reasonably procured in the market area. The CEMP could help to ensure that construction-related traffic trips are minimized through appropriate policies and implementation measures. **2-4**

▸ Recommended Adaptive Air Quality Mitigation Measure

Appendix D (General Conformity Determination for Carbon Monoxide) states that the project would be built over 10 years or more. Since construction is projected to last a decade or more, it is reasonable to assume that additional, potentially more stringent air quality control measures would be implemented under Federal and/or State of California air quality statutes. EPA strongly encourages an adaptive, flexible mitigation measure enabling NASA to implement additional air quality mitigation measures as the project is built. EPA recommends that the following mitigation measure be included in the Final Programmatic EIS and Record of Decision, whereby NASA would:

"*Consult with the Bay Area Air Quality Management District on an annual basis during the project's construction to determine if additional air quality mitigation for criteria air pollutants and/or toxic air contaminants is warranted, and to undertake such additional air quality mitigation as is appropriate and reasonable, and in an expeditious manner.*"

- Recommended Modification to Mitigation Measure AQ-6b for Use of "Cleaner" (Lower Emissions) Construction Equipment

  We acknowledge NASA's effort to use newer, cleaner burning diesel-fueled construction equipment, especially in reducing NOx emissions (DPEIS at p. 0-19). EPA recommends the following mechanism to ensure that this mitigation measure is implemented. We suggest that if equipment is leased, to the extent the cost of leasing 1996 or newer model year construction equipment does not exceed 110 percent of the average cost of available leased equipment, the 1996 or newer model year construction equipment shall be considered possible to use. To the extent that the equipment is owned, it shall be considered possible to use a minimum of 75 percent of the total horsepower for the project from construction equipment that is 1996 or newer model year. Such conditions can be incorporated into the recommended CEMP (see above). **2-4**

General Conformity and Air Quality Mitigation

Appendix D of the Draft Programmatic Environmental Impact Statement (DPEIS) provides a general conformity determination for carbon monoxide. The San Francisco Bay Area is a CO maintenance area and the project's CO emissions are estimated to exceed the maintenance area threshold level of 100 tons per year [40 CFR 93.153 (b)(2)]. NASA's conformity determination for CO uses a 'hot spot' analysis to show that the project's CO emissions will not cause or contribute to any new violation of the National Ambient Air Quality Standards (NAAQS) for that pollutant. If the 'hot spot' analysis used for conformity is acceptable to the BAAQMD, EPA believes that this approach for general conformity is consistent with 40 CFR 93.158(a)(4)(i). The FPEIS should document the BAAQMD's acceptance of the approach used by NASA to ensure this project's general conformity. **2-5**

The Bay Area is an ozone nonattainment area, although the DPEIS indicates that the estimated emissions of volatile organic compounds and NOx are not expected to exceed the applicable threshold levels of 100 tons per year [40 CFR 93.153(b)(1)]. However, even though the requirements of general conformity are met, according to the DPEIS, EPA believes that additional air quality mitigation measures under the National Environmental Policy Act (NEPA) would benefit the air basin, and the health of its residents, and in that context we provided the preceding recommendations (*Mitigation to Reduce Emissions During Construction*).

LETTER 2

Lisa Hanf, Manager, Federal Activities Office, United States Environmental Protection Agency, January 25, 2002.

2-1: This is an introductory comment and summary of the contents of the EIS. No response is required.

2-2: Mitigation Measures AQ-7a through AQ-7c have been added to address EPA's concerns.

2-3: This comment states that the US Environmental Protection Agency (EPA) has assigned a rating of EC-2, Environmental Concerns - Insufficient Information, to the NADP and the DPEIS. This rating system was developed as a means to summarize EPA's level of concern with a proposed action. The EC rating assigned to the NADP DPEIS means that the EPA has "*identified environmental impacts that should be avoided in order to fully protect the environment*".

As a result of this comment on the DPEIS, NASA has added mitigation measures to better address construction-period emissions.

2-4: This comment provides detailed recommendations for construction-period air quality mitigations or mitigation modifications. All of these recommendations are incorporated in the mitigation measures referenced in the response to Comment 2-2.

2-5: As requested by the EPA, the BAAQMD letter confirming a satisfactory CO analysis has been incorporated into this Final Programmatic EIS. Please see the letter on the following page.

BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

March 18, 2002

Sandy Olliges
NASA Ames Research Center
MS 218-1
Moffett Field, CA 94035

Subject: NASA Ames Development Plan

Dear Ms. Olliges:

This letter will confirm your telephone conversation with BAAQMD staffmember Henry Hilken regarding the carbon monoxide (CO) analysis in the NASA Ames Development Plan Environmental Impact Statement (EIS).

Regarding the CO analysis, US EPA's January 25, 2002 letter concerning the EIS states that if the CO hotspot analysis is acceptable to the BAAQMD, then EPA believes the analysis satisfies general conformity requirements. BAAQMD staff has reviewed the CO analysis and concludes that the analysis is satisfactory. The analysis is sound and is consistent with previous conversations between BAAQMD staff, NASA staff and EIS consultants. Therefore, with respect to US EPA's comment letter, the CO analysis is acceptable to the BAAQMD.

If you have any questions, please contact Henry Hilken, Principal Planner, at (415) 749-4642.

Sincerely,

T E Perardi

Thomas Perardi
Director, Planning and Research

DEPARTMENT OF THE AIR FORCE

50TH SPACE WING (AFSPC)

JAN 28 2002

MEMORANDUM FOR NASA AMES RESEARCH CENTER
ATTN: SANDY OLLIGES

FROM: 21 SOPS/CC
Onizuka Air Force Station
1080 Lockheed Martin Way Box 129
Sunnyvale CA 94089-1235

SUBJECT: 21 SOPS Document Review Comments

1. Attached are 21 SOPS review comments to the NASA Ames Development Plan, Draft Programmatic Environmental Impact Statement, Reference Volume I, dated Nov 2001.

2. Please contact Maj. Kirk Broussard, Mission Support Officer at (408) 752-3622 for questions.

SANDRA E. FINAN, Lt Col, USAF
Commander, 21st Space Operations Squadron

Attachment:
Comments on Draft Environmental Impact Statement

DOCUMENT REVIEW COMMENTS

DATE OF REVIEW: 17 January 2002

REVIEWER: 21 SOPS DSN 561-3622

DOCUMENT: NASA Ames Development Plan, Draft Programmatic Environmental Impact Statement, Reference Volume I, dated Nov 2001

1. Page 2-26, B.2.h. Transportation Demand Management Program, 1st Bullet:
The mandatory TDM should not affect any remaining Federal tenants that have already qualified for reduced travel due to military housing on Moffett, or reservists attending drill at Moffett one weekend a month, or shoppers at the exchange or commissary. The mandatory TDM program will significantly impact these shoppers, reservists, and Federal agencies. How will NASA mitigate these significant impacts? **3-1**

2. Page 2-61, 2.C.5.F. Projects Not covered in the EIS or in the Cumulative Analysis, 1st Bullet – Relocation of Commissary:
As stated: "Implementation of the NADP would require removal of the existing Commissary and Exchange . . ." At this time the Commissary and Exchange do not have plans to move to an alternate location and prefer to stay where they are and continue to provide service to active and retired military. **3-2**

3. Page 2-64, 2.C.5.F. Projects Not covered in the EIS or in the Cumulative Analysis, 5th Bullet – Charleston Avenue Bridge:
The proposed Charleston Avenue Bridge would impact the quality of life of the military families living between the main gate to Moffett Field and the proposed bridge. This new bridge would bring additional public traffic into the NRP area when the gate moves which could impact all NRP tenants. **3-3**

4. Page 3.3-10, C.1.b. Site Access:
21 SOPS would like information on the new Eastside Airfield Macon Road gate. 21 SOPS requires 24/7 access to support RV lot and Golf Course, operations and maintenance. **3-4**

5. Page 3.3-33, C.4.5. Parking:
Will all parking in the NRP become pay for parking - specifically at the Exchange facilities and at Bldg 569? How will this new policy affect current tenants within the NRP? **3-5**

LETTER 3

Sandra Finan, Lt Col, US Air Force Commander, 21st Space Operations Squadron, Department of Air Force, January 28, 2002.

3-1: The mandatory Transportation Demand Management (TDM) Plan would apply to all lessees, tenants and partners located in buildings within the NASA Research Park (NRP). Residents of military housing at Moffett Field who work within the NRP would be subject to and eligible for the TDM programs identified in the TDM Program as it is phased in over the build-out period. These employees and their employers would also be subject to the parking requirements of the plan. However, those military tenants located in the Eastside/Airfield are not required to be subject to the TDM programs in place in the NRP and Bay Views areas. Note that all existing trips have been evaluated. In general, the TDM is designed for the future development.

3-2: At this time, the Exchange and Commissary are not slated to be located on the NRP site once development is complete. Ames Research Center management has proposed other locations on site to meet those organizations' needs, but an agreement has not yet been reached. Prior to the NADP, the DoD Commissary and Exchange leadership had indicated a desire to build a new facility at Moffett Field. Ames Research Center management is committed to accommodating, to the extent possible, all current resident agencies in their plans to be located at Moffett Field in the future.

3-3: This is a comment stating the commentor's opinion about the Charleston Avenue Bridge, which is not a part of the project. Comment noted. No response is required.

3-4: The changes to security that have already occurred at the ARC are not a part of the project reviewed in this EIS.

The security fence and associated gates have already been realigned. The Macon Road gate is now under the control of the California Air National Guard and operates 24 hours a day, seven days a week.

3-5: As stated on page 2-28 of the EIS, the paid parking program would be phased in as new development occurs throughout the NRP and Bay View areas. At Phase 2 of the plan, existing tenants located in the NRP would be subject to the paid parking program. The paid parking program would allow a tenant, lessee, or partner to implement parking cash-out in order to cover the cost of parking for employees.

Since the paid parking program would be implemented in Phase 2 of the development, it is assumed that the Exchange facilities would be gone by the time the program was implemented.

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 129TH RESCUE WING (ANG)
MOFFETT FEDERAL AIRFIELD, CA 94035

28 Jan 02

MEMORANDUM FOR SANDY OLLIGES
NASA AMES RESEARCH CENTER
MAIL STOP 218-1
MOFFETT FIELD, CA 94035-1000

FROM: 129th RQW/CC
Box 103 Mail Stop 28
Moffett Federal Airfield, CA 94035

SUBJECT: Draft Environmental Impact Statement Document Review

The purpose of this letter is to provide NASA with review comments to the NASA Ames Development Plan, Draft Programmatic Environmental Impact Statement, Reference Volume I & II, dated Nov 2001. Please contact Lt Col Fred Francisco, 650-603-9414, ffrancisco@mail.arc.nasa.gov, for questions.

FOR THE COMMANDER

PEDRO F. SOBRINO, Major, CA ANG
Executive Officer

Attachment: 129th RQW Comments on Draft-DEIS documents

129th RQW Comments on Draft-DEIS documents

Reference: NASA Ames Development Plan
Draft Programmatic Environmental Impact Statement, dated November 2001
January 28, 2002

Volume I

1. EXECUTIVE SUMMARY, pg 0-1, A. 1. Study Area, 1st Bullet - NASA Research Park: 4-1
Add: Current facilities used by Army Reserve, DoD Commissary and Exchange, Air Force, Air National Guard all federal agencies that remained after the Navy departed.

2. EXECUTIVE SUMMARY, pg 0-2, A. 2. Project Alternatives, 1st Bullet - Alternative 1: The No Project Alternative: 4-2
Consideration should be given under this alternative to master planned construction by CA Air National Guard on the Eastside/Airfield. In the event NASA made land available in the NRP area, several federal agencies might replace or add to existing facilities. This could include a new commissary, exchange, and new/consolidation of reserve and guard facilities.

3. EXECUTIVE SUMMARY, pg 0-4, A. 2. Project Alternatives, 5th Bullet - Alternative 5: The Preferred Alternative: 4-3
Confirm future construction in the Eastside/Airfield area for the CA Air National Guard and other organizations that have been offered land to build on.

4. EXECUTIVE SUMMARY, pg 0-5, A. 3. Project Purpose and Need, 1st Para: 4-4
The last sentence does not identify "federal agencies" which was the basis for the 1992 no cost transfer of land from the Navy to NASA.

5. EXECUTIVE SUMMARY, pg 0-6, B. Areas of Controversy and Issues Identified During Scoping, 3rd Para: 4-5
Ames has worked with the neighboring communities, but Ames has not included federal agencies located at Moffett Field. "Particular areas of concern. . .", none of which include lost federal agencies and the effect it will cause. Include these potential areas of Significant Impacts caused by NASA eliminating federal agencies from the NRP and effects on the Eastside/Airfield.

- CA Air National Guard
- Army Reserve Center
- Military Exchange
- Commissary
- Military Museum

What is the impact to the community of losing these federal agencies? 4-6

6. INTRODUCTION, pg 1-2, C. Location and Component Parts of the Site of the Proposed Action:
6.1. Figure 1-3 shows the loss of several mission critical federal facilities, presently used by federal agencies. Example: The lab project covers facilities required by the Army Reserve and the CA Air National Guard. 4-7
How will NASA mitigate these significant impacts?
Will NRP actions next to the fight line affect airfield operational safety? 4-8
If so, how will NASA mitigate this impact?

6.2. Figure 1-4 shows the loss of building 146 and 152, which are jointly used by the military at Moffett Field. The renovation of this building was a joint project between the Army Reserve and CA ANG. Loss of this building will significantly impact the military at Moffett. 4-9
How will NASA mitigate this significant impact?

6.3. Figure 1-7 Eastside/Airfield, Development area does not show critical airfield facilities that should be identified with dashed lines similar to the CANG area. These areas include jet fuel storage and transmission, CANG facilities north of hangars 2 & 3, airfield joint use facilities such as wash area, critical flight safety zones, and munitions storage areas. With out these facilities, the airfield would be significantly impacted. 4-10

7. INTRODUCTION, pg 1-15, C. Location and Component Parts of the Site of the Proposed Action: 1st Bullet - NASA Research Park: 4-11
Add: Current facilities used by Army Reserve, DoD Commissary and Exchange, Air Force, Air National Guard all federal agencies that remained after the Navy departed.

8. INTRODUCTION, pg 1-17, D. Brief History of Ames Research Center, 7th Para:
When the Navy closed Moffett Field, the Base Closure and Realignment Commission recommended: NASMF and ALFCL will be retained as Federal facilities for joint use by NASA, the Department of Defense (DOD), and other federal entities. The Navy NASA MOA of 1992 transferred with no cost the property to NASA. NASA now is saying:

"In 1994 NASA took control of Moffett field, and began planning how to use the newly acquired land to support its research mission." 4-12

Alternate 5 supports the NASA Research Park concept at the cost of Federal entities and DOD tenants that remained on the joint federal facility.
What mitigation measures is NASA giving to the Federal entities that serve our local community, state, country, and have invested millions in support of Moffett Federal Airfield, not knowing NASA Ames has been planning since 1994 to; "use the newly acquired land to support its research mission"?

9. INTRODUCTION, pg 1-18, E. The Existing Comprehensive Use Plan and Subsequent Planning Efforts, 1st Para:
The Comprehensive use plan provides for the CA Air National Guard to build out its Master Plan. Replacing the CUP with the NADP will significantly impact the CA ANG. NADP must encompass CUP development. 4-13

10. INTRODUCTION, pg 1-19, E. The Existing Comprehensive Use Plan and Subsequent Planning Efforts, 5th Para:
NASA has elected, based on the six point initiative, failed to include all existing Federal tenants in the NRP area. How will NASA mitigate the impacts caused by eliminating the Federal tenants? 4-14

11. INTRODUCTION, pg 1-24, I. Review, Implement and Permitting of the Proposed Action, 2. Project Implementation, 4th Para:
Confirm that the CA Air National Guard will not be constrained from completing the build out of its Master Plan, due to constraints imposed by the NADP or NADP EIS. 4-15

12. CHAPTER 2 DESCRIPTION OF ALTERNATIVES, pg 2-3, A. Baseline, 1st Bullet:
The CA Air National Guard baseline should include all planned construction identified in the 1997 Master Plan. Do not limit to 64,000sf. 4-16

13. CHAPTER 2 DESCRIPTION OF ALTERNATIVES, pg 2-26, B. 2. Other Program Components, h. Transportation Demand Management Program, 1st Bullet:
The mandatory TDM should not affect the Federal tenants that have already qualified for reduced travel due to military housing on Moffett, or reservists attending drill at Moffett one weekend a month, or shoppers at the exchange or commissary. The mandatory TDM program will significantly impact these shoppers, reservists, and Federal agencies. How will NASA mitigate these significant impacts? 4-17

14. CHAPTER 2 DESCRIPTION OF ALTERNATIVES, pg 2-31, 2. Open Space, C. The Alternatives, 1. Alternative 1, The No Project Alternative, c. Security and Circulation:
If no new development, what is the point in moving the security fence and modifying the Ellis Gate? 4-18

14.1. TABLE 2-5 Alternative 2 Land Use Summary:
CANG Master Plan (EA) includes more "Developable Area (SF)" than 64,800. Table needs to be corrected. 4-19

15. CHAPTER 2 DESCRIPTION OF ALTERNATIVES, pg 2-52, 2. Open Space, C. The Alternatives, 5. Alternative 5, The Preferred Alternative, a. Land Use and Job Generation, 1st Bullet -NRP:
The demolition of 560,000 sf of existing space eliminates facilities that are usable and the federal government has spent millions of dollars renovating. How does NASA justify this lose of usable facilities and what is NASA doing mitigate the significant impacts to the federal agencies? **4-20**

16. CHAPTER 2 DESCRIPTION OF ALTERNATIVES, pg 2-52, 2. Open Space, C. The Alternatives, 5. Alternative 5, The Preferred Alternative, a. Land Use and Job Generation, 3rd Bullet -Eastside/Airfield:
NASA management has offered parcels of Eastside/Airfield land for development by federal tenants. No notice of proposed construction in this DEIS represent an incomplete picture of potential development at Moffett Field. Alternate 5 identifies only the construction of a control tower. The Air National Guard should be covered by the CUP or this DEIS for construction of additional facilities to complete its Master Plan. Clarify that NASA has considered its resident agencies future construction as part of this EIS. **4-21**

17. CHAPTER 2 DESCRIPTION OF ALTERNATIVES, pg 2-58, 2. Open Space, C. The Alternatives, 5. Alternative 5, The Preferred Alternative, b. Open Space:
TABLE 2-13 Population Summary.
Conference Guests identified for Alternate 5 is 250. This number seems low compared to a 275,000sf facility with a staff of 250. Conference guests generate impacts in the form of travel, housing, meals, etc. Have impacts for the actual number of quests been calculated? **4-22**

18. CHAPTER 2 DESCRIPTION OF ALTERNATIVES, pg 2-59, 2. Open Space, C. The Alternatives, 5. Alternative 5, The Preferred Alternative, c. Security and Circulation, 3rd Para:
"During peak parking demand events, . . . large portions of the paved airfield areas would be used as spillover parking." This would leave the airfield runways and taxiways vulnerable and add uncertainty to the availability of the runways in case of emergencies. Was this added traffic considered in the traffic studies? What comments did the FAA have to using an airfield for a spillover parking lot? **4-23**

19. CHAPTER 2 DESCRIPTION OF ALTERNATIVES, pg 2-60, 2. Open Space, C. The Alternatives, 5. Alternative 5, The Preferred Alternative, D. Buildout and Analysis Horizon, 1st Para:
Confirm that the CA Air National Guard build out of its Master Plan is included in the construction Clean Air Act calculations. **4-24**

20. CHAPTER 2 DESCRIPTION OF ALTERNATIVES, pg 2-61-62, Open Space, C. The Alternatives, 5. Alternative 5, The Preferred Alternative, F. Projects Not covered in the EIS or in the Cumulative Analysis, 1st Bullet – Relocation of Commissary:
As stated: "Implementation of the NADP would require removal of the existing Commissary and Exchange. . ." thus the NADP is the cause for replacement. The DEIS accounts for certain relocations, but specifically excludes others. Example; Relocation of the control tower to the Eastside/Airfield is included, but the Commissary and Exchanges are not. For accuracy the EIS should include all associated impacts and not lessen those impacts by knowingly underestimating construction impacts. **4-25**

21. CHAPTER 2 DESCRIPTION OF ALTERNATIVES, pg 2-64, 2. Open Space, C. The Alternatives, 5. Alternative 5, The Preferred Alternative, F. Projects Not covered in the EIS or in the Cumulative Analysis, 5th Bullet – Charleston Avenue Bridge:
The proposed Charleston Avenue Bridge would negatively impact the quality of life of the military families living between the Moffett Field main gate and the proposed bridge. **4-26**

22. CHAPTER 3.1 PUBLIC POLICY, pg 3.1-3, A. NASA Policies, 2. Comprehensive Use Plan and its Environmental Assessment, 2nd Para:
NASA states that airfield operations will be restricted to 24,000 flights per year to accommodate air emissions from the baseline construction. Airfield restrictions will jeopardize and could limit future use of the airfield. Air emissions should not be transferred from the airfield to satisfy excessive demolition and expansion plans. Restricting airfield operations limits future airfield use thus limiting potential revenues that could offset airfield operating losses claimed by NASA. Airfield air emissions should not be used for construction offsets. **4-27**

23. CHAPTER 3.1 PUBLIC POLICY, pg 3.1-4, A. NASA Policies, 3. NASA Ames Proposed Six Point Initiatives, 1st Para:

The six point major initiatives agreed to with the community did not mention the future of the existing federal tenants. Did the City of Mountain View and City of Sunnyvale understand that NASA planned to displace the federal military tenants from the NRP when they endorsed NASA's initiatives? **4-28**

24 CHAPTER 3.1 PUBLIC POLICY, pg 3.1-48, E. Joint Planning, 1. Community Advisory Committee, 2nd Para:

"Once under NASA control, airfield use dropped to 24,000 flight operations a year. This was one quarter of their pre-transfer level, and insufficient number to support the operations and maintenance of the field." If this information is accurate, NASA should not limit airfield operations, but seek federal agencies with flight operations to help defray costs. **4-29**

25. CHAPTER 3.3 TRAFFIC AND CIRCULATION, pg 3.3-10, C. Existing Transportation System, 1. Roadways, b. Site Access, 4th Bullet - East Gate:

The East gate is no longer opened from 5:00 - 5:00, M-F. **4-30**

26. CHAPTER 3.3 TRAFFIC AND CIRCULATION, pg 3.3-33, C. Existing Transportation System, 4. Transportation Demand Management, 5. Parking:

Pay for parking to encourage alternative transportation has been debated for years. Artificially limiting and charging for parking could cause NRP individuals to aggressively park in lots historically used by the military including streets in the housing area. How does NASA expect to control this significant impact on the resident agencies remaining on Moffett Field? **4-31**

27. CHAPTER 3.9 BIOLOGICAL RESOURCES, pg 3.9-19, C. Existing Biological Resources, 1. NRP and Ames Campus Areas, b. Wildlife, ii. Special-Status Animals, 14th Para:

This paragraph states that burrowing owls have thrived at Ames because of federal ownership thus lack of "rampant development" and that Ames is "closed to the public". NASA DEIS identifies major development, and an open campus no longer closed to the public, thus putting the burrowing owls and their habitat at risk. **4-32**

28. CHAPTER 3.10 NOISE, pg 3.10-22, C. Existing Noise environment, 3. Airfield Operations, Traffic, and Other Existing Noise Sources:

Airfield operational noise levels were measured on Sept 22, 1999. How was this data scaled up to project airfield noise for the 80,000 events, addressing the environmental limit? **4-33**

29. CHAPTER 3-11 AESTHETICS, pg 3.11-16, A. Visual Character of Ames Research Center, 5. Eastside/Airfield, b. Visual Unit 11: CANG Area:

NASA Ames states (referring to the CA Air National Guard land):
"This triangle of land is mostly undeveloped, ruderal land." The dictionary defines ruderal as: Growing in rubbish, poor land, or waste.
NASA Ames description of the south end of the triangle as growing in rubbish, poor land, or waste is not representative of land management by the guard. This triangle of land is managed/used by NASA Ames as an environmental reclamation site. The CANG Master Plan identifies this land for a future transportation facility. "There are two small clusters of mostly one-story buildings used by the CANG, many of which are relatively new with immature landscaping, as shown in Figure 3.11-12." Characterizing the area as two small clusters does not represent the area. The area has buildings with adjacent land adequate for the CANG to consolidate and construct mission essential facilities. The term "immature landscape" does not represent existing landscape. Trees are numerous on the land, grass areas are sprinkled, medians have been landscaped, and land awaiting development has been left in its natural form. The CANG area was Master Planned (Plan approved by NASA Ames Management) and meets good design planning practice for aviation facilities next to active runways. Open land is either airfield safety zones, identified for future facilities, identified for burrowing owls, recreation, or restricted areas necessary to maintain security. **4-34**

Volume II

30. 4.1 PUBLIC POLICY, pg 4.1-3, B. Impact Discussion, 1. NASA Policy, c. Joint Policy Efforts, i. Community Advisory Committee on Moffett Federal Airfield, 2nd para:
The document states: "All five alternatives are also compatible with the CAC's recommendations that discourage expanded use of the airfield." Restricting airfield operations (discourage expanded use of the airfield) will potentially significantly impact the ability of NASA to afford airfield operations and maintenance costs. How will NASA mitigate airfield O & M costs if usage is discouraged?

4-35

LETTER 4

Pedro Sobrino, Major, California Air National Guard, Executive Officer, Department of Air Force, January 28, 2002.

4-1: The amendment recommended by the commentor has been incorporated into page 0-2 of the Final Programmatic EIS.

4-2: Alternative 1, the No Project Alternative, proposes no new development in the NASA Research Park beyond what has already been approved through two documents. Those documents are the 1997 Final Master Plan Short Range Projects Environmental Assessment for the California Air National Guard (CANG) 129th Rescue Wing and the 1994 Comprehensive Use Plan (CUP) and its Environmental Assessment. The specific use of new or existing buildings under these referenced documents is outside the scope of this EIS.

4-3: All alternatives include the baseline development foreseen in Alternative 1, including CANG's construction in the Eastside/Airfield area.

4-4: As suggested by the commentor, the word "federal" has been added to the last sentence of the first paragraph in section A.3. of the Executive Summary.

4-5: There are no plans to displace CANG, the Army Reserve Center or the military museum under the NADP. While the Exchange and Commissary would be displaced, NASA is working with these organizations to find new locations. Please see the response to Comment 3-2.

4-6: Since military tenants are not generally expected to be displaced, there would be no impact to the community. If the Commissary and Exchange are removed, there may be some inconvenience for its

current customers, but this would not be considered a significant impact under NEPA.

4-7: The purpose of the EIS is to describe alternatives for project development and to identify the environmental impacts of those alternatives. Discussions of tenant requirements are outside the scope of the EIS document.

NASA has been working with the military tenants since assuming responsibility for the facility in 1994. NASA will continue to work in good faith with the current tenants through the NASA Ames Development Plan implementation. NASA intends to find locations for the Army Reserve and CANG facilities currently in the NRP area in other parts of the ARC.

In particular, CANG is already consolidating its operations to the Eastside/Airfield. The CANG's 1997 Master Plan describes in detail new and renovated facilities on its 45-hectare (110-acre) campus. As noted in the CANG Master Plan, the consolidation will "create a sense of identity; eliminate shared space with other tenants; improve safety by vacating facilities not up to current codes or not designated for their current use."

4-8: The NADP and its EIS have no bearing on, and no objectives regarding, existing or future aviation activity at Moffett Field. As stated in Section 3.2, Subsection C, aircraft operations would be unaffected by the NADP.

The NASA Ames Development Plan supports and maintains the current use of Moffett Federal Airfield as a limited-use federal airfield. The Plan does not open the Airfield to general aviation, nor does it curtail future use as an airfield. Moffett Federal Airfield will continue to serve as a limited-use federal airfield primarily in support of NASA's aerospace research and development activities. The airfield

is also used by resident federal agencies, such as the California Air National Guard. Other partners and resident agencies use the airfield through Space Act Agreements and Interagency Agreements with NASA. Ames also plans to use the airfield for an annual airshow and technology exposition.

Under the development plan, NASA will continue to operate the airfield following Federal Aviation Regulations Parts 77 and 139, maintain the waivers to Air Installation Compatibility Use Zone regulations that were granted to the Navy and have carried over into NASA airfield operations, and encourage the use of air traffic patterns that minimize noise events in the surrounding communities.

4-9: Please see the response to Comment 4-7.

4-10: Most of the amendments recommended by the commentor have been incorporated into Figure 1-7 of the Final Programmatic EIS. Critical flight safety zones are shown in Figures 3.2-2 and 3.2-3.

4-11: The amendment recommended by the commentor has been incorporated into page 1-15 of the Final Programmatic EIS.

4-12: It is common knowledge under federal law that any lands held by a federal agency are to be used to support that agency's mission. Moreover, NASA has been engaged in an open and public planning process regarding the future of Moffett Field since it took control of the site in 1994. Other federal tenants are being accommodated as much as possible in NASA's proposed new uses of the site in support of its mission. Please also see the response to Comment 4-7.

4-13: Buildout of the square footage in the CANG Master Plan and Comprehensive Use Plan (CUP) are assumed as part of baseline conditions in this EIS. Thus, the NADP "encompasses" the CUP as requested by the commentor.

4-14: Please see the response to Comment 4-7.

4-15: The CANG would not be constrained from completing the build out of its Master Plan due to the implementation of the NADP. The CANG Master Plan is assumed as part of the baseline conditions in this EIS.

4-16: NASA has included the CANG's 1997 Master Plan as part of the Baseline studied under this EIS. See also response to Comment 4-7. Tables 2-2, 2-5,2-7, 2-9, 2-11, 2-14 have been corrected to indicate the total CANG baseline.

4-17: See response to Comment 3-1.

4-18: The change in the security fence alignment, which has already occurred, has been implemented to support development approved under the 1994 CUP.

4-19: Page 2-3 of the EIS has been changed to state that the California Air National Guard 129th Rescue Wing, Moffett Federal Airfield Master Plan, 1998, recognizes 28,209 square meters (303,634 square feet) of proposed and existing facilities in the Eastside Airfield. Tables 2-5, 2-7, 2-9, 2-11 and 2-14 have been corrected to add existing CANG facilities to the Baseline.

4-20: The comment is misleading because it implies that all 52,000 square meters (560,000 square feet) have been renovated. In fact, most of the space to be demolished has not been renovated and would require substantial building code upgrades to be usable by NASA, its partners, and other federal agencies. Please see the response to Comment 4-7.

4-21: Please see the responses to Comments 4-7 and 4-16.

4-22: Conference guests resulting from NADP would generate both a fiscal and traffic impact. In terms of fiscal impacts, the EIS states that the conference center guests would generate a positive fiscal impact for Santa Clara County through payment of transit occupancy tax (TOT). This analysis is contained in Table 4.14-10. In terms of traffic impacts, the trip generation rates for the conference center account for both day-use and overnight guests. Trips associated with the conference center are part of the overall traffic analysis contained in Section 4.3 of this EIS (see page 4.3-5). Conference center guests would not generate an additional regional housing impact. The number of conference rooms was estimated based on the square footage for Alternative 5 and compared to the numbers for the other alternatives. Since the trip generation rate for this use was estimated and not based on any standard rate, it should be regarded as a conservative estimate.

4-23: The special events that would require use of the Airfield for spillover parking are expected to occur fewer than eight times a year. In addition, these events are not part of the proposed project; they occur already. Currently, the apron in front of Building N211 is used for special event parking between six and eight times per year, while the large apron in front of Hangar One is used four times per year. At these times, airfield use is then limited to Runway 32R. Thus, this condition would not change substantially under the NADP.

Per standard traffic engineering practice, the traffic impacts of these special events were not analyzed in the DPEIS because of their low frequency. The traffic analysis included in the DPEIS evaluated typical operation of all of the proposed project uses including the proposed museums. Special events will continue to require extensive traffic control, as is currently provided. No comments were received from the FAA.

4-24: The buildout of the CANG was included in the baseline projections. It is a separate Federal action with a separate NEPA document, and

therefore, the associated emissions are not required to be included in NASA's conformity determination.

4-25: As stated on page 2-73 of the EIS, the relocation of the Commissary and Exchange is not covered under the EIS of the cumulative analysis because they were not sufficiently far enough along in the planning stages to merit inclusion in the cumulative projects list. In addition, replacement of these facilities would not occur under the NADP. However, trips associated with a potential new location in the military housing area are included in the cumulative traffic analysis.

4-26: Please see the response to Comment 3-3.

4-27: NASA currently has no plans to increase the use of the airfield beyond the current 24,000 flights per year. If flight operations were proposed to be increased, they would be subject to a separate environmental review to ensure that they would be consistent with this EIS or to provide additional environmental documentation.

4-28: NASA has briefed the cities regarding the changes in land use that would occur under the NADP. To date, briefings have occurred periodically since the CAC report.

4-29: Please see the response to Comment 4-27. When NASA originally took over responsibility for the airfield in 1994, NASA did seek federal agencies with flight operations to help defray the costs of operating all of Moffett Field. However, base closures continued to occur in the Bay Area and limited the number of military agencies that would need a site locally. Therefore, non-DOD agencies such as the Coast Guard were sought as well; NASA advertised the availability of the site widely and recruited over a three-year period, with no new tenants resulting. Thus NASA has already sought other federal agencies with flight operations as requested by the commentor.

4-30: Comment noted. The operation of the East Gate does not affect the transportation analysis. No project traffic was assigned to the gate since it will only provide a secured entrance to the East Airfield and will not be used for access to the NRP area.

4-31: NASA has not yet developed a plan to address the potential that NRP employees, students and visitors would park in the military housing area, although this is a valid concern. NASA will work with the managers of the existing residential area, and other areas that may also be affected by this problem, to develop a residential permit parking system.

4-32: Mitigation measure BIO-11b specifies mitigation measures to prevent long-term disturbances of wildlife from increases in population associated with implementation of the NADP.

4-33: Airfield operation noise levels in this EIS represent levels from 1999 and through 2010. Annual average noise exposure contours were taken from "Assessment of Aircraft Noise Conditions at Moffett Federal Airfield," P&D Consultants, Michael R. McClintock & Company, August 28, 2000 (see footnote 14, page 3.10-21 of this Final EIS), which include both 1999 levels and projections for 2010. No increase in noise is anticipated over the 1999 Baseline levels. There is no difference between the 1999 and 2010 contours because levels of aircraft operations are projected to remain the same. The noise exposure contours shown in Figure 3.10-7 therefore apply to both 1999 and 2010.

4-34: The term "ruderal" is used here to refer to disturbed land that contains non-native species. The text in Section 3.11, subsection A.5.b, has been changed to reflect the commentor's description of the land. The term "immature" is used here to describe young plantings.

4-35: As stated in the NADP, NASA has no plans to change the level of airfield use from the 1999 baseline levels. NASA's proposed use of the airfield is consistent with both the CUP EA and the Moffett Federal Airfield Community Advisory Committee Final Report in that the NADP does not propose any expansion of airfield activities. Since the NADP baseline includes the 1999 level of airfield operations, all five alternatives permit the continued use of Moffett Field as a limited federal airfield. Since the alternatives do not propose any change to the baseline levels of use, the proposed action under the NADP is not anticipated to have any material impact on NASA's airfield operations or maintenance costs.

DEIS Comments

Department of Toxic Substances Control

Edwin F. Lowry, Director
1001 "I" Street, 25th Floor
P.O. Box 806
Sacramento, California 95812-0806

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Gray Davis
Governor

December 19, 2001

Sandra Olliges
NASA/Ames Research Center
M/S 218-1
Moffett Field, California 94035

Re: Ames Development Plan

The Department of Toxic Substances Control (DTSC) is in receipt of the environmental document identified above. Based on a preliminary review of this document, we have determined that additional review by our regional office will be required to fully assess any potential hazardous waste related impacts from the proposed project. The regional office and contact person listed below will be responsible for the review of this document in DTSC's role as a Responsible Agency under the California Environmental Quality Act (CEQA) and for providing any necessary comments to your office:

5-1

Barbara Cook
Site Mitigation Branch
700 Heinz Avenue, Suite 200
Berkeley, California 94710

If you have any questions concerning DTSC's involvement in the review of this environmental document, please contact the regional office contact person identified above.

Sincerely,

Guenther W. Moskat, Ch
Planning and Environmental Analysis Section

LETTER 5

Guenther W. Moskat, Chief, Planning and Environmental Analysis Section, Department of Toxic Substances Control, December 19, 2001.

5-1: This comment is an acknowledgment of receipt of the DPEIS and states that additional review of the document is required to assess potential hazardous waste related impacts of the proposed action. No response is required.

STATE OF CALIFORNIA
GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH
State Clearinghouse

Gray Davis
GOVERNOR

Steven A. Nissen
DIRECTOR

ACKNOWLEDGEMENT OF RECEIPT

DATE: December 21, 2001

TO: Sandra Olliges
National Aeronautics and Space Administration
Ames Research Center
M-S 218-1
Moffett Field, CA 94035

RE: Ames Development Plan
SCH#: 2000082070

This is to acknowledge that the State Clearinghouse has received your environmental document for state review. The review period assigned by the State Clearinghouse is:

Review Start Date: December 13, 2001
Review End Date: January 28, 2002

We have distributed your document to the following agencies and departments:

Air Resources Board, Major Industrial Projects
California Highway Patrol
Caltrans, District 4
Caltrans, Division of Aeronautics
Department of Fish and Game, Region 3
Department of Parks and Recreation
Department of Toxic Substances Control
Native American Heritage Commission
Office of Historic Preservation
Public Utilities Commission
Regional Water Quality Control Board, Region 2
Resources Agency
San Francisco Bay Conservation and Development Commission
State Lands Commission

6-1

The State Clearinghouse will provide a closing letter with any state agency comments to your attention on the date following the close of the review period.

Thank you for your participation in the State Clearinghouse review process.

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
916-445-0613 FAX 916-323-3018 WWW.OPR.CA.GOV/CLEARINGHOUSE.HTML

LETTER 6

State Clearinghouse, Governor's Office of Planning and Research, State of California, December 21, 2001.

6-1: This is an acknowledgment of receipt letter from the State Clearinghouse, including a list of agencies to whom the DPEIS was distributed. No response is required.

Winston H. Hickox
Secretary for Environmental Protection

California Regional Water Quality Control Board

San Francisco Bay Region

Internet Address: http://www.swrcb.ca.gov
1515 Clay Street, Suite 1400, Oakland, California 94612
Phone (510) 622-2300 ∃ FAX (510) 622-2460

Gray Davis
Governor

Date: JAN 2 4 2002
File No. 2188.05 (BKW)

Sandra Olliges
NASA/Ames Research Center
Mail Stop 218-1
Moffett Field, CA 94035-1000

Re: Draft Environmental Impact Statement for NASA Ames Development Plan; SCH # 200082070

Dear Ms. Olliges:

Regional Water Quality Control Board (Regional Board) staff have reviewed the draft Environmental Impact Report (EIR) for the NASA Ames Development Plan (NADP). The NADP evaluates four alternatives, in addition to a No Action Alternative, for the development of a shared-use education, research, and development campus at Ames Research Center in Santa Clara County. Regional Board staff have the following comments on the draft EIR for the NADP.

Comment 1
Section 3.9.B.2, *State Laws*.
This section should include the Porter-Cologne Water Quality Control Act (California Water Code, Division 7). Section 3.9.B.1, *Federal Laws*, includes a discussion of Section 401 Water Quality Certification in subsection (i). This discussion identifies the role of the Regional Board in certifying that Section 404 Permits issued by the Army Corps of Engineers (ACOE) are in conformance with state water quality standards. Activities in areas that are outside of the jurisdiction of the ACOE (e.g., isolated wetlands or stream banks above the ordinary high water mark) are regulated by the Regional Board under the authority of the Porter-Cologne Water Quality Control Act. Activities that lie outside of ACOE jurisdiction may require the issuance, or waiver, of waste discharge requirements from the Regional Board. It is likely that improvements to the storm drain system will require either Section 401 Certification or waste discharge requirements. **7-1**

Comment 2
Section 4.9.B.2.c.iv, Effects of Increased Stormwater Runoff from Impermeable Surfaces on Sensitive Habitats.
This section cites the Biological Assessment for the NADP to support the absence of significant impacts to wetlands. Page 67 of the Biological Assessment includes the following text, "Mitigation Measure 6a: Potentially contaminated runoff would be managed using stormwater Best Management Practices. Swales would be constructed adjacent to wetlands in upland areas to intercept and filter any runoff before it reaches the wetland." This mitigation measure should be incorporated in the EIR for the NADP. **7-2**

Comment 3
Section 4.9.C., Impacts and Mitigation Measures, Mitigation Measure BIO-2b and Mitigation Measure BIO-5b.
Text in these mitigation measures should be modified to state that the Regional Water Quality Control Board has regulatory jurisdiction over wetlands at NADP and, therefore, the Regional Board, as well as the ACOE, will review the wetland enhancement plan and the wetland mitigation plan.

7-3

If you have any questions, please contact Brian Wines at (510) 622-5680 or e-mail bkw@rb2.swrcb.ca.gov.

Sincerely,

Dale Bowyer
Section Leader, Alameda-Santa Clara Watershed Section

cc: State Clearinghouse, Attn: Katie Shulte Joung, P.O. Box 3044, Sacramento, CA 95812-3044
USACE, San Francisco District, Attn: Regulatory Branch, 333 Market Street, San Francisco, CA 94105 –2197
Santa Clara Valley Water Control District, Attn: Sue Tippets, Community Projects Review Unit 5750 Almaden Expressway, San Jose, Ca 95118-3686
CDFG, Central Coast Region, Attn: Robert Floerke, Regional Manager, P.O. Box 47, Yountville CA 94599

LETTER 7

Dale Bowyer, Section Leader, Alameda-Santa Clara Watershed Section, California Regional Water Quality Control Board, January 24, 2002.

7-1: As requested by the commentor, a discussion of the Porter-Cologne Water Quality Act has been added to the regulatory environment discussion of Section 3.9, subsection B.2.d, Biological Resources.

7-2: Mitigation Measure 6a from the Biological Assessment (Appendix E) has been incorporated into the Final Programmatic EIS, as the commentor suggests, as BIO-18. Swales have also been added to the BMP discussion on pages 2-33 and 2-34.

7-3: The Regional Water Quality Control Board has been added to the Final Programmatic EIS in Section 4.9.C as a regulating agency in the development and approval of a wetland enhancement plan under Mitigation Measure BIO-2b.

STATE OF CALIFORNIA - THE RESOURCES AGENCY

Gray Davis, *Governor*

DEPARTMENT OF FISH AND GAME
POST OFFICE BOX 47
YOUNTVILLE, CALIFORNIA 94599
(707) 944-5500

January 28, 2002

Ms. Sandra Olliges
NASA/Ames Research Center
M/S 218-1
Moffett Field, CA 94035

Dear Ms. Olliges:

Draft Environmental Impact Statement (DEIS)
Ames Development Plan
Moffett Field, Santa Clara county
SCH# 2000082070

Department of Fish and Game personnel have reviewed the above-referenced document. There are a number of special status species which are identified in the DEIS and others potentially in the area. Although not afforded the same legal protections as formally listed species, their categorization as special status is an indication that their populations are in decline and/or under significant development pressure. In some cases, listing is probably warranted, but has not occurred for a variety of non-biological reasons. Because these species are declining, the Department encourages individuals and organizations undertaking development that could cause impacts to evaluate the magnitude of those impacts and, where possible, to provide mitigation measures.

Burrowing owl (*Athene cunicularia*) is a special status species that occurs on the project site. This is the largest or second largest population of burrowing owls in the south San Francisco Bay area and is critical to the continued survival of the species in the area. The Department views the continued existence of burrowing owls on the site as an extremely significant issue of regional importance. Development proposals need to incorporate the maximum amount of avoidance of impacts to owls and owl burrows, and the retention and management of existing owl burrow locations and habitat. The Department has scheduled a meeting at Moffett Field to discuss burrowing owl issues. We intend to work with NASA/Ames Research Center to develop a comprehensive burrowing owl avoidance and mitigation strategy and implement a long-term owl habitat management plan. It is critical to the survival of the species in this area that the viability of this population not be adversely affected by

8-1

development proposals. Conservation of known nest sites is the most critical component of a conservation strategy. Secondarily, conservation, funding, and management, in perpetuity, of owl habitat and implementation of an adequate management plan is necessary to ensure population viability at this location. The Department strongly recommends that a comprehensive burrowing owl conservation strategy be developed and implemented in consultation with the Department to ensure that this vital population is not adversely impacted by development proposals or approvals. 8-1

Accordingly, the Department recommends that additional discussion be provided for the following species and, where impacts are identified, that mitigation be provided: Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*), Point Reyes bird's beak (*Cordylanthus maritimus palustris*) (it appears surveys have been done for this species), Pacific pond turtle (*Clemmys marmorata*), bald eagle, golden eagle, loggerhead shrike (*Lanis ludovicianus*), peregrine falcon (*Falco peregrinus anatum*), horned lark (*Eremophila alpestris aetia*), long-legged myotis (*Myotis volans*), Yuma myotis (*Myotis yumanensis*) and long-eared myotis (*Myotis evotis*). In addition, we recommend more discussion of impacts to all special status bat species. The species list indicates there is no habitat on site for bats, but this conclusion should be fully supported. A facility the size and nature of Moffett Field would surely contain some habitat useable by building- roosting bats. 8-2

The report states that surveys completed for California red-legged frogs and California tiger salamanders failed to find any, but it is unclear whether the golf course ponds were included in the survey. If they were not, the Department recommends surveys of those water bodies as well. 8-3

The DEIS states that there has been a marked change in the vegetative community in Eastern Diked Marsh (EDM) after the installation of a sedimentation basin upstream of the EDM and an increase in freshwater flows as a result of Navy discharges of treated groundwater in 1998. A change in species composition in this area has likely had an impact on a number of listed and special status species which have used the area in the past. 8-4

While not a direct impact of the current proposal, the ongoing impacts of these actions should be evaluated in the current environmental document if they will continue. The DEIS

states that the Navy will discontinue their discharges, but it is not clear as to when this will occur, if it is certain to be discontinued or how much of the problem is occurring as a result of the Navy operation. The Department recommends that this item be discussed more fully to determine whether unmitigated impacts will continue to occur once the NASA/Ames Development Plan is implemented. Any impacts continuing to occur should be mitigated. **8-4**

Mitigation measure BIO-4 includes a provision for the use of trash containers which cannot be opened by predators and scavengers. The Department supports such a measure, and believes it would be more effective if broadened to include construction areas and other temporary uses. Our experience has been that trash and debris, which is often less rigidly controlled on construction sites, can attract significant numbers of predators and scavengers to an area. Designation of a regular construction clean-up crew also is invaluable in reducing this impact. **8-5**

Two ordinance storage bunkers appear to be proposed for construction in the burrowing owl mitigation site northeast of the airfield. Why are structures being built in a mitigation area? **8-6**

Not all of the recommended mitigation measures for impacts to burrowing owls (such as Mitigation 4 under Impact 2, p.21) have been incorporated into the DEIS. Why were some mitigations excluded? **8-7**

Thank you for the opportunity to be involved in this process. Questions regarding this letter and further coordination on these issues should be directed to Dave Johnston, Environmental Scientist, at (831) 475-9065; or Scott Wilson, Habitat Conservation Supervisor, at (707) 944-5584.

Sincerely,

Robert W. Floerke
Regional Manager
Central Coast Region

cc: See next page

cc: Office of Planning and Research
State Clearinghouse
Post Office Box 3044
Sacramento, CA 95812-304
Via Fax: (916) 323-3018

U. S. Fish and Wildlife Service
2800 Cottage Way, W-2605
Sacramento, CA 95825

Santa Clara Valley Audubon Society
22221 McClellan Road
Cupertino, CA 95014

LETTER 8

Robert W. Floerke, Regional Manager, Central Coast Region, Department of Fish and Game, January 28, 2002.

8-1: This comment explains the importance of preserving habitat for burrowing owls and recommends measures to ensure the viability of owl populations at Moffett Field. The recommended measures are consistent with those proposed in the *Burrowing Owl Habitat Management Plan* (see Appendix F) that is a part of the NADP project.

A meeting was held at NASA with Fish and Game on February 1, 2002.

8-2: Specific discussions of golden eagle, horned lark, and peregrine falcon are included in the "special-status species" section on the Bay View area on pages 3.9-27 and 3.9-28 of the EIS. Additional discussion about these species, including bald eagle, and their ranges, habitat requirements, and potential to occur at Ames Research Center are included in Table 3.9-2. Impacts to foraging areas for raptors (including golden eagle, bald eagle, and peregrine falcon) are discussed on page 4.9-5.

Because all of the avian species mentioned in the comment utilize grassland habitat, impacts are addressed simultaneously in the discussion regarding "loss of upland habitat adjacent to marsh areas" on page 4.9-8 of this EIS. Impacts to these special-status species were determined to be less-than-significant due to the small amounts of low quality habitat that would be removed as a result of implementation of the proposed action and because of the presence of large amounts of grassland habitat in the northern portions of Bay View and the North of Bay View area. In addition, extensive grassland habitat is protected and offers habitat for these species off-site at the adjacent Shoreline Regional Park.

Western pond turtle is discussed in the "special-status species" section on the Bay View area on page 3.9-30 and on the Eastside/Airfield area on page 3.9-35 of this EIS. Additional information regarding the range, habitat requirements, and potential for western pond turtle to occur are given in Table 3.9-2. One unconfirmed sighting of a turtle has been reported in the settling basin at the northern end of the Bay View area. NASA Ames conducted a Western pond turtle survey in May and June 2002. Four were found in the Northern Channel north of and adjacent to the Eastside/Airfield area and one was found at Ames Research Center in the Marriage Road ditch in the Eastside/Airfield area. Seven were found downstream (east) of the Northern Channel, before it flows to Guadalupe Slough. No Western pond turtles were observed in the north of Bay View area. The NADP would not impact any jurisdictional waters that the Western pond turtle may inhabit, and has included measures to protect water quality and volumes within the North of Bay View area, in Chapter 2 of this Final EIS.

Both delta tule pea and Point Reyes bird's-beak are included in Table 3.9-1. As described in the table, potential habitat is present for the delta tule pea in the fresh and brackish marsh, and for Point Reyes bird's-beak in the salt marsh. Previous surveys for special-status plants at ARC failed to find these two species or any other special-status plants.[1] In addition, even if these two species occurred on-site (i.e. if previous surveys overlooked their presence), there would be no impacts to these species because no development is proposed in their potential habitat.

[1] Directed Rare Plant Surveys for California Sea-Blite and Point Reyes Bird's Beak at NASA Ames Research Center and Moffett Federal Airfield, CA, by D.B. Zippin and T.M. Engels, 1997., *Vegetation Surveys and Mapping at Moffett Field, CA*, by Science Applications International Corporation (SAIC), 1999.

A discussion of bat species that may occur at Ames Research Center and potential impacts to them has been added to pages 3.9-21 and 3.9-22 in Section 3.9 and in the impact and mitigation measures discussion for Impact BIO-5 in Section 4.9.C of this Final EIS.

8-3: The golf course ponds were surveyed as part of the 2001 amphibian survey conducted by Scott and Alderete (2001).[2] No California red-legged frogs were found; Scott and Alderete believe that they have been extirpated from the Ames Research Center. As stated in the report,

> "All but three of the golf course ponds had depauperate faunas and floras. Few individuals of only the most resistant species were seen, and the most obvious organism was a floating mat of decaying green algae. How much of this biological desert is a result of current golf course management practices (herbicide runoff, chemicals for algal control), and how much a result of soil salinity and salt in the water source used to fill the ponds is unknown."

8-4: The Navy intends to cease its discharge of treated groundwater into the Eastern Diked Marsh (EDM) within the next several years. Stormwater runoff has always flowed to the EDM. The installation of the sediment basin changed the location, but not the amount of freshwater flow. NASA has added measures to reduce the rate of stormwater flow to the EDM as a result of the NADP.

8-5: In response to this comment, NASA has added a new subpoint to Mitigation Measure BIO-4, which requires that a regular construction

[2] *Amphibian Survey of Moffett Field, Santa Clara County, California, with Focus on the California Red-Legged Frog (Rana aurora draytonii) and the California Tiger Salamander (Ambystoma californiense)* by N.J. Scott and C. Alderete, July 2001.

cleanup crew be designated to ensure that construction debris and trash do not attract predators or scavengers.

8-6: The ordnance storage bunkers the commentor is referring to are existing structures, not proposed.

8-7: Building height restrictions recommended in the *Burrowing Owl Habitat Management Plan* are contained in the Design Guidelines. The TDM Program (described in Appendix B) for the NRP and Bay View does include the construction of parking structures to accommodate the shared parking that would be required to support the TDM goals of this project. Construction impacts to burrowing owls would be minimized with the implementation of mitigation measures BIO-1, BIO-9, BIO-10, BIO-11a and BIO-11b. All the mitigations in the BOHMP are incorporated by reference in the EIS.

Department of Toxic Substances Control

Edwin F. Lowry, Director
700 Heinz Avenue, Suite 200
Berkeley, California 94710-2721

Winston H. Hickox
Agency Secretary
California Environmental
Protection Agency

Gray Davis
Governor

January 28, 2002

Sandra Olliges
NASA Ames Research Center
Mail Stop 218-1
Moffett Field, California 94035

Dear Ms. Olliges,

Thank you for the opportunity to comment on the Ames Development Plan Environmental Impact Statement (SCH# 2000082070). As you may be aware, the California Department of Toxic Substances Control (DTSC) oversees the cleanup of sites where hazardous substances have been released pursuant to the California Health and Safety Code, Division 20, Chapter 6.8. As a Resource Agency, DTSC is submitting comments to ensure that the environmental documentation prepared for this project to address the California Environmental Quality Act (CEQA) adequately addresses any required remediation activities which may be required to address any hazardous substances release.

After reviewing the Environmental Impact Statement (EIS), DTSC has the following comments:

1. Samples taken in and around buildings in the project area that predate 1978 tested positive for both lead and asbestos. Please ensure that the handling and disposal of these materials are conducted within federal and state guidelines. **9-1**

2. After the relocation of the California Air National Guard Motor Pool, additional soil sampling should be conducted. **9-2**

3. Due to the increased amount of pavement associated with the Development Plan discussed in the EIS, pumping water out of the retention ponds into Stevens Creek may become more frequent. Contamination is known to exist at the site and the forecasted increase in both automobiles and residents has the potential create addition contamination of the surface water. Therefore, treatment of the water in the retention ponds prior to discharge to Stevens Creek should be considered. **9-3**

4. Groundwater treated for volatile organic compounds and petroleum product contamination is being proposed for irrigation uses in the Development Plan. Please identify the permits that will be required and treatment standards that will have to be achieved. **9-4**

As discussed in Section 3.7, *Hazardous Materials, Site Contamination and Pollution Prevention*, of the EIR, both the Navy and NASA currently have sites within the boundaries of the Development Plan with known contamination. Most of these sites if not all of them are or were under the oversight of federal, state, or local regulatory agencies. Please identify the oversight agency for each of the areas, a brief description, and the stage of the remedial action being undertaken. **9-5**

Please contact Xavier Bryant at (510) 540-3835 if you have any questions or would like to schedule a meeting. Thank you in advance for your cooperation in this matter.

Sincerely,

Barbara J. Cook, P.E., Chief
Northern California - Coastal Cleanup
Operations Branch

cc: Governor's Office of Planning and Research
State Clearinghouse
1400 Tenth Street
Sacramento, California 95814

Guenther Moskat
CEQA Tracking Center
Department of Toxic Substances Control
P.O. Box 806
Sacramento, California 95812-0806

LETTER 9

Barbara J. Cook, P.E., Chief, Northern California - Coastal Cleanup Operations Branch, Department of Toxic Substances Control, January 28, 2002.

9-1: The proposed procedures for handling and disposal of lead and asbestos from buildings demolished or rehabilitated as part of the proposed project are described in Sections 6.4 and 6.5 of the *Draft Environmental Issues Management Plan* (EIMP) prepared for the EIS. The procedures described in those sections fully comply with both federal and State guidelines for dealing with lead and asbestos contamination.

9-2: Any additional investigation and, if necessary, remediation, would be the responsibility of the US Navy in accordance with its Federal Facilities Agreement with US EPA and the California Regional Water Quality Control Board.

9-3: To minimize pollutant discharge to Stevens Creek, NASA has revised the conceptual plan for the storm drain system to allow for more infiltration and slower flows, as described in Section 4.5, of this Final EIS, and would also implement the Best Management Practices described on page 2-31 of this Final EIS.

9-4: At present, the groundwater that the Navy is treating for volatile organic compounds and petroleum products is being discharged to the Eastern Diked Marsh via a sedimentation basin, after being remediated to meet Regional Water Quality Control Board standards. The NPDES permit number for this discharge is CAG912003, under the requirements of Board Order number 99051. The NADP proposes that the Navy would allow NASA to use part or all of that treated water for irrigation in the Shenandoah Plaza area, with the remainder discharged into Stevens Creek, which would require a new NPDES

permit. The groundwater in question would thus be treated to meet the requirements for both permits.

9-5: Pages 3.7-6 through 3.7-19 of this Final EIS have been amended to specify the oversight agencies for each of the identified contaminated sites. A brief description of each site and the stage of remedial action undertaken is already included on those pages.

DEPARTMENT OF TRANSPORTATION
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January 28, 2002

SCL-101-47.01
SCL101661
SCH #2000082070

Ms. Sandra Olliges
NASA- Ames Research Center, M/S 218-1
Moffett Field, CA 94035

Dear Ms. Olliges:

Ames Development Plan – Draft Environmental Impact Statement (DEIS)

Thank you for including the California Department of Transportation (Department) in the environmental review process for the proposed project. We have examined the Draft Environmental Impact Statement have the following comments:

1. The Department is very concerned that the Ames Development Plan will have a significant regional and interregional impact on State Highway facilities because no mitigation has been proposed for impacts to freeway segments. According to Table 4.3-5, Alternate 5 (Preferred Alternative) of the Ames Development Plan will generate 14,366 daily trips, which includes 1,564 peak hour AM trips and 1,983 peak hour PM trips. Page 4.3-24 indicates that under all alternatives, the proposed project will add traffic volumes that are at least one percent of capacity (and in some cases nearly seven percent) on all nearby freeway segments. The DEIS states that all significant impacts to State facilities are "significant and unavoidable" due to cost, ownership and political considerations. Since the proposed project will have such a significant impact on the transportation system we strongly recommend that mitigation be proposed for these impacts regardless of cost, ownership or political considerations. At a minimum, NASA should make a "fair-share" contribution towards future improvements to State transportation facilities. **10-1**

2. Page 3, Section 1.2.1 indicates that the proposed development in Ames Campus is not subject to the Ames Development Plan Transportation Demand Management (TDM) Plan and that employees and employers in the Ames Campus will be offered existing and future NASA Ames Campus TDM programs. Since 3,850 daily trips will be generated under Alternative 5 (NASA's Preferred Alternative), and a TDM trip reduction of 715 daily trips is being claimed, we would like to review the existing and future NASA Ames Campus TDM programs, which are excluded from the subject TDM. **10-2**

3. Alternatives 2 and 4 would create significant impacts to the on-ramps of U.S. Highway 101 (U.S. 101) and State Route (SR) 237 near the project site. We strongly recommend the following measures be implemented to mitigate these impacts: **10-3**

   a) Widen freeway ramps near the project area for extra vehicle storage and the addition of turn lanes.
   b) Extend left turn pockets on local streets to improve the flow of traffic.

c) Provide funding towards HOV bypass lanes on freeways near the project area and outside the immediate project vicinity that will be significantly impacted by the project.
d) Install ramp-metering equipment at the eastbound SR 237/ Mathilda Avenue on-ramp.
e) Install a Closed Circuit Television Camera (CCTV) at the Ellis Street/ U.S. 101 interchange.
f) Pay a "fair-share" contribution towards funding proposed ramp-metering equipment at the northbound U.S. 101/ Ellis Street and northbound U.S. 101/ Moffett Blvd on-ramps.

I0-3

4. The Department has existing Traffic Operation Systems (TOS) and ramp-metering equipment within the project limits that need to be kept operational and accessible to operations personnel during all phases of construction.

I0-4

5. Please provide details on how on-site housing trips (daily, in, out, and total) were projected from the number of housing units, for all alternatives. For example, under the preferred alternative, 290 housing units are proposed in the Nasa Research Park area, and an on-site housing reduction of 1,091 trips was projected for the PM peak period. Also specify the number of housing units in each housing type (e.g., apartment or townhouse) for each alternative since they have different gross trip rates.

I0-5

6. Is the Bay View area available to employees within the project site only? If not, this will create off-site vehicle trips. Were these trips considered in the traffic analysis?

I0-6

7. All Congestion Management Program (CMP) facilities and intersections should be identified in the Traffic Appendix.

I0-7

8. Queuing impacts to all CMP facilities should be identified for all alternatives.

I0-8

9. A figure with "Year 2013 No Project" intersection lane configurations should be provided.

I0-9

10. Section 4.10 (2), on Page 4.10-5 states that noise levels would increase by 3 dB as the result of project-generated traffic, based on PM peak hour traffic. Generally speaking, peak hour traffic is not the noisiest hour of traffic due to congestion and, therefore, slower travel speeds. An increase of 3 dB can only occur because of a significant increase in travel speeds or a doubling of traffic volume, neither of which can occur without increasing roadway capacity. We, therefore, conclude that there will be no adverse impact caused by traffic noise levels.

I0-10

11. The description of the storm drainage systems for both existing and proposed conditions did not address any potential storm runoff from outside of the project development area and did not include plans for accommodating this runoff in the proposed storm drainage systems. According to Caltrans As-Built plans for U.S 101 south of the project area between Moffett Boulevard and the northbound on-ramp of SR 237, there are several culverts crossing U.S. 101. Historically these culverts have been conveying storm runoff from the watersheds south of U.S. 101 toward Moffett Field in the proposed development area. In general, these culvert outlets are the "bubble-up" type boxes, which allow the water to overflow from the boxes and drain northward through Moffett Field and then to the San Francisco Bay. All of these cross culverts have existed since they were built about 40 years ago. It is our understanding that drainage law states that the downstream property owners are required to accept existing drainage patterns and flows onto their property. Hence the NASA Ames Development Plan should account for drainage runoff from these State owned drainage facilities that drain to their property, and revise the drainage plans accordingly. The Departments storm drain cross-culverts between Ellis Street and the northbound on-ramp of SR 237 have been altered by the

I0-11

Santa Clara Valley Transportation Authority (VTA) for the construction of the Light Rail along the nearby Manila Drive and Macon Road. The VTA should review the DEIS and provide layouts of the existing Light Rail storm drain system and the proposed VTA storm drainage project plans for draining the storm runoff from the State drainage facilities. The Department provided VTA the following As-Built plans for U.S. 101 in the project area, between Ellis Street and SR 237: 1109.3, 1109.5 and 437084. Additional storm drain information is available from the Department, upon request. In summary, the DEIS does not adequately address storm runoff from State storm drain facilities. Please revise the storm runoff drainage plan as suggested above and resubmit for our review. **10-11**

12. The DEIS should address any temporary Water Quality impacts during construction, and post-construction Water Quality impacts, and include mitigation measures for these impacts. The following are requirements that are applicable to all construction/ improvement projects within the Department's right-of-way:

    - Projects shall adhere to the conditions of the Department's statewide NPDES Permit CAS #000003, Order #99-06-DWQ, issued by the State Water Resources Control Board (SWRCB). Adherence to the compliance requirements of the NPDES General Permit CAS #000002, Order #99-08-DWQ, for General Construction Activities is also required. Copies of these permits may be obtained from the SWRCB web site at http://www.swrcb.ca.gov. **10-12**

    - Incorporation of Treatment Best Management Practices into the design and operations of all highway/ transportation projects is also required under Section 4.4 of the Storm Water Management Plan which implements the Department's statewide NPDES permit.

We look forward to receiving a response to our comments, as well as a copy of existing and future TDM programs for the Ames Campus and storm runoff drainage plans for the Ames Development Plan.

Should you require further information or have any questions regarding this letter, please call Maija Cottle, of my staff at (510) 286-5737.

Sincerely,

RANDELL H. IWASAKI
Acting District Director

By Paul Frederick

for JEAN C. R. FINNEY
District Branch Chief
IGR/CEQA

c: Katie Shulte Joung (State Clearinghouse)

LETTER 10

Randell H. Iwasaki, Acting District Director, Department of Transportation, January 28, 2002.

10-1: NASA and its partners will discuss with CalTrans how the NADP may participate in regional mitigations.

10-2: NASA currently operates a successful TDM program with many of the same elements as the plan proposed for the NASA Research Park. The existing Ames Campus TDM program includes the following programs:

- $30.00 monthly transit subsidy for NASA civil service employees.
- Informational website.
- Shuttle service that meets every peak-hour Caltrain run.
- Preferential carpool parking.
- Bicycle lockers.
- On-site transit ticket sales.

Ames Campus last conducted a mode split survey in 1999. At that time, 63 percent of Ames Campus employees drove alone to work; 19 percent carpooled; 6 percent bicycled; and 12 percent took public transit.

10-3: NASA will work with Caltrans and the appropriate local agencies to identify which, if any, interchange and mainline improvements are feasible to mitigate the traffic impacts caused by Alternatives 2 and 4 should either of these project alternatives be implemented. At this time, Mitigated Alternative 5 is the Preferred Alternative, so it is unlikely that Alternative 2 or 4 will be implemented.

10-4: The proposed project is not expected to preclude access to or affect the operation of any Traffic Operations Systems and ramp metering equipment maintained by Caltrans. With the Preferred Alternative (Mitigated Alternative 5), no mitigation to Caltrans-controlled ramp intersections would be required.

10-5: Peak hour trip reductions were applied to all proposed on-site housing units within the NASA Research Park (NRP) and Bay View areas. Under Alternative 5 prior to additional mitigation, a total of 290 student apartments and dormitories are proposed in the NRP area and a total of 750 townhomes and apartments are proposed in the Bay View area. NASA has indicated that the proposed housing would be open to NADP employees and students and their family members only. Thus, trip reductions were applied to all units based on the assumption that at least one resident of the townhome/apartment units works or attends classes at NADP, and that both residents of the student apartments/dormitory units would work or study within NADP. Reductions were applied to all dwelling units regardless of location because: 1) parking charges would strongly discourage internal vehicle travel within the project site, 2) the proposed shuttle service, bicycle and pedestrian facilities and services provided throughout the NRP and Bay View areas would provide an attractive alternative to automobile trips, and 3) on-site amenities including retail, recreation, and child-care facilities would help reduce the need for residents to travel outside the site.

Trip generation and the assumed reductions for each type of housing unit are described in detail on pages 4.3-3 and 4.3-4 of the DPEIS. Daily trip reduction for the housing units is assumed to be 35 percent on weekdays and 10 percent on weekend days. Equivalent peak-hour trip reductions applied to housing were also applied to the employment and student uses within the NRP. For example, if the proposed on-site housing reduction was expected to result in 500 fewer PM peak hour vehicle trips (330 inbound to homes and 170 outbound

from homes), then an equivalent reduction of 500 trips was applied to employment centers and university uses (170 inbound and 330 outbound). First, reductions from on-site housing were applied to the gross number of vehicle trips generated to determine the number of gross external trips (those that would be assigned outside the project site). Next, reductions for the TDM program were applied to the gross number of external trips to determine the number of net new trips that would use the external roadway system including freeways.

NASA has added additional housing in Mitigated Alternative 5. The new housing numbers and trip reductions are shown in Chapter 5.

10-6: As stated in the response to Comment 10-5, NASA has indicated that the proposed housing would be open to Moffett Field employees and students and their family members only.

10-7: Text has been added to pages 3.3-2 and 3.3-15 of the EIS to identify Congestion Management Program (CMP) facilities in the study area.

10-8: In response to this comment, a new analysis of vehicle queues at key intersections has been added on pages 4.3-23 through -24, and on Table 4.3-10 of this Final EIS.

10-9: As noted on page 3.3-37 in the EIS, the only changes to lane configurations assumed to occur at any of the study intersections under baseline conditions would be at the Highway 101/Moffett Boulevard interchange ramps. Figure 3.3-6 illustrates the planned changes expected to be in place by 2005. The lane configurations for all other intersections under Year 2013 No Project Conditions are the same as shown on Figure 3.3-3.

10-10: As stated on page 4.10-7, traffic generated by the proposed project would not result in a significant adverse noise impact.

10-11: According to information received from Caltrans, about 470 hectares (1,400 acres) south of Highway 101 drain under the freeway through several bubble-ups and culverts and discharge onto NASA property. It appears that this is based on drainage patterns that existed when Highway 101 was constructed and that the area that actually discharges onto NASA property is much less. Drawings received from the City of Mountain View indicate that almost all of the area is picked up by the drainage system south of Highway 101 and directed west to Stevens Creek. For simplicity, BKF Consultants has assumed that the approximately 20 hectares (50 acres) of Caltrans right of way discharges onto Moffett Field. Regardless of the number or type of discharge structures, this is such a small area relative to the 610 hectares (1,500 acres) of drainage area within Moffett Field that it does not impact storm runoff calculations or the required infrastructure at this conceptual phase of design.

The Santa Clara Valley Transportation Authority (VTA) has modified the drainage system along Highway 101 south of Ames Research Center including some of the bubble-ups and culverts. It is anticipated that prior to schematic design of the Ames Research Center storm drain system, the actual location and configuration of the bubble-ups and culverts will be incorporated into the design. The situation has been addressed for the current (conceptual) level of design as described below, and the drainage calculations listed in Appendix C have been revised:

- **South Side of the Airfield.** An area of 6 hectares (15 acres) discharges to the area south of the airfield. Since the drainage system in this area (Drainage Area 6 in the EIS) would not be changed, and the impervious area would not be increased, the existing runoff entering the site requires no accommodation on the part of NASA other than to maintain the status quo.
- **West Side of the Airfield.** An area of 14 hectares (35 acres) discharges to the area west of the airfield, which would be

developed under the NADP. The flow from this area has been estimated and included in the design of the revised drainage system presented in Section 3.5, subsection B.4, of this Final Programmatic EIS.

10-12: To address temporary and post-construction water quality impacts for construction within Caltrans right-of-way, Impact and Mitigation Measure CIR-7 has been added to the Final Programmatic EIS.

UNIVERSITY OF CALIFORNIA, SANTA CRUZ

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SILICON VALLEY CENTER

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January 28, 2002

Sandy Olliges
NASA Ames Research Center Environmental Services Office
MS 218-1
Moffett Field, CA 94035

Ames Development Plan Draft Environmental Impact Statement: University of California Comments

Dear Ms. Olliges:

The University of California would like to thank NASA for the opportunity to comment on the NASA Ames Development Plan Draft Programmatic Environmental Impact Statement (EIS). In developing its preferred alternative ("Alternative Five"), NASA has gone a long way toward addressing many potentially serious unmitigatable impacts associated with the NASA Ames Development Plan.

The University of California ("the University") is a partner in the future development of the proposed NASA Research Park (NRP). As such, the University has a stake in ensuring that the development of the NRP is conducted in a manner that is consistent with its commitment to carrying out campus and related developments so as to be respectful of the environment and minimize, to the greatest extent feasible, potential environmental impacts. Further, all University projects must conform to the rigorous requirements of the California Environmental Quality Act (CEQA), since the University is a state agency. We are providing a number of comments in the hopes that they will assist NASA in preparing its Final EIS, which provides the framework for subsequent development and associated CEQA review.

I1-1

1. Fair Share Commitments. The University anticipates that its development contribution to impacts identified in the EIS will be limited, reflecting a proportion of total development impacts. The University will prepare a separate environmental document, an environmental impact report (EIR), under the framework of CEQA to identify its responsible contribution to the impacts associated with the NASA Ames Research Center (most likely to be limited to the University Reserve, and Bay View portions of the project site).

The University's ability to financially contribute to mitigation requirements set forth in the Draft EIS is limited by both practical and legal constraints. For example, the University of California is exempt from fee exactions, except to the extent specifically provided for in Government Code Section 54999 *et seq.* for contributions to utilities. These issues will be addressed in the University's EIR prepared pursuant to CEQA to address its proposed development of the project site.

I1-2

Furthermore, because the research and development project, as entitled under NASA's August 1994 Final Environmental Assessment (EA) for the Moffett Field Comprehensive Use Plan, is the

baseline condition for purposes of the Draft EIS, the University assumes that NASA is responsible for fully mitigating these baseline impacts that are over and above the current conditions. Additionally, the University assumes that NASA will be financially responsible for all mitigation measures adopted with the EIS unless and until it obtains specific written concurrence of participating partners. I I-2

2. Relationship of Draft EIS to CEQA. The University of California is the lead CEQA agency for the project. The Draft EIS provides raw data for use as a baseline condition and environmental setting, however NEPA standards of significance are often very different from the CEQA standards the University will ultimately rely on.

The Draft EIS makes reference to CEQA standards of significance in several impact areas (e.g., water, energy, infrastructure), but in places within the document uses outdated CEQA standards. It is unnecessary for the Draft EIS to come to any CEQA conclusions at this time; therefore, the University requests that all references to CEQA standards be removed from the Draft EIS. If NASA retains the references to CEQA, the correct standards must be stated in the Draft EIS and the conclusions of the standards must be fully supported within the Draft EIS. I I-3

Specific citations are as follows:

Page 4.0-1, Paragraph 2
Page 4.5-1, Section A.1
Page 4.5-9, Section B.1
Page 4.5-15, Section C.1
Page 4.5-23, Section D.1
Page 4.5-30, Section E.1
Page 4.5-33, Section F.1

3. Traffic Demand Measures (TDM). The Draft EIS does not make clear the difference between the baseline and future traffic conditions, and how mitigations are allocated between these phases. It is the University's position that all mitigation measures identified in the TDM will apply to all components of the NRP including those entitled under previous EAs, even if they are developed under the context of project specific TDM. The University requests that the Draft EIS be modified to fully identify the allocation of all mitigation measures. I I-4 I I-5

4. Bay View Development. The development of housing in the Bay View area at significant densities is an underpinning to the NRP project. The University fully supports the concept of housing at this site, but an evaluation of the physical and economic feasibility of this component of the NRP has not been demonstrated in the EIS. Because the housing development in the Bay View area is offered to mitigate traffic and housing impacts, the Draft EIS must be modified to include the necessary analysis to support its conclusions regarding the viability of housing at the Bay View site. I I-6

5. Storm Drainage. Based on the information provided in the Draft EIS, the University assumes that the permanent pump system described on page 4.5-26 is needed to address the baseline condition and would not be an obligation of the NRP and participating partners. The Draft EIS should be modified to clearly allocate this mitigation to the baseline impacts and NASA should be identified as the agency responsible for its implementation. The University also requests that NASA consult with Santa Clara County Water District to clarify the effects of the NRP on future flooding conditions. I I-7 I I-8

In addition, Section 4.5, Subsection D.2.c (page 4.5-28) notes that fill will be required to prevent flooding in the Bay View area: fill is one design solution, but not a necessary solution. We suggest that rather than specifying a single design solution, the EIS note fill as one of several possible alternative solutions. I I-9

6. Air Quality. Measures to control dust and PM_{10} impacts are specified based on Bay Area Air Quality Management District (District) recommendations. Because the District's recommended measures may change over time, the University suggests that NASA specify in a revision to Mitigation Measure AQ-5a that current District recommendations will be implemented, and provide the appropriate reference for the listed measures. I1-10

7. Fiscal Impacts (Draft EIS Section 4.14, Subsection C). Several different revenue streams are described that derive from development of the NRP, including construction taxes and development fees for school districts. Please note that as previously stated, the University of California is exempt from fee exactions, except to the extent specifically provided in Government Code Section 54999 *et seq.* for contributions to utilities. Therefore the revenue projections assumed in the EIS may be incorrect. I1-11

Again, thank you for the opportunity to review the Draft EIS for the Ames Development Plan. The University of California looks forward to NASA's incorporation of these comments in the Final EIS.

Sincerely,

R Michael Tanner

R. Michael Tanner
Interim Director
U.C. Silicon Valley Center

LETTER 11

R. Michael Tanner, Interim Director, U.C. Silicon Valley Center, University of California, Santa Cruz, January 28, 2002.

11-1: This is an introductory comment that acknowledges that the University of California is a partner in the future development of the proposed NASA Research Park (NRP). No response is required.

11-2: This comment states that the University of California will prepare its own Environmental Impact Report (EIR) under the California Environmental Quality Act (CEQA) on its component of the project, and that it anticipates that its participation in mitigation of project impacts will be limited to the fair share contributions identified in the EIR. The comment further notes that the University is exempt from most fee exactions.

In fact, all partners who choose to join with NASA in the construction and use of the facilities to be constructed under the NADP will need to voluntarily agree to make appropriate, proportional contributions toward the implementation of all mitigation measures identified in this EIS.

The implementation of the Comprehensive Use Plan (CUP) will not have any significant impacts, as documented in the Finding of No Significant Impact (FONSI) for the CUP EA. Therefore, there are no impacts for NASA to mitigate, except as described in the CUP EA.

NASA will negotiate with all project partners on these issues before signing binding agreements allowing for construction or use of NADP facilities, and will ensure that all mitigation measures identified in this EIS are implemented, with funding in appropriate amounts from each participating partner.

11-3: Because NEPA has no clear standards of significance, CEQA standards were used as benchmarks in preparing the EIS. NASA internally developed the standards of significance presented in the EIS, which are not necessarily consistent with CEQA, but which nevertheless rely on them for direction. To be consistent with the remainder of the document, direct reference to CEQA standards have been removed from Section 4.5 discussions of standards of significance. The discussion in Section 4.0 has been expanded to further explain the reference to CEQA in this EIS.

11-4: As described in the DPEIS, baseline conditions include traffic generated by land uses approved under the 1994 Comprehensive Use Plan (CUP) and its Environmental Assessment (CUP EA). The CUP EA projects are also covered under the NRP TDM program.

The TDM program for the proposed NRP development described in the DPEIS is not a separate mitigation measure, but is part of the project itself. The TDM Program would apply to partners, lessees and tenants located in the Bay View and NRP areas of the Ames Research Center that are covered by the conditions of the NASA Ames Development Plan EIS. Lessees covered by the CUP EA would ultimately conform to the overall NRP TDM Program. The first phase of the NRP TDM program is the same as the CUP EA TDM Program. Both programs set an Average Vehicle Ridership target of 1.72 in the final phase of NRP development.

11-5: Mitigation measures will be allocated to various partners and NASA entities in the Mitigation Implementation Monitoring Plan, which is being developed concurrently with this Final Programmatic EIS.

A Mitigation Implementation Monitoring Plan (MIMP) will outline responsibilities and timing of mitigations that are a part of the Final Programmatic EIS. The MIMP is not part of the Final Programmatic EIS. Rather it is adopted through signing the Record of Decision.

However, it is not circulated as a public document as it would be if it were part of the Final Programmatic EIS.

11-6: Based upon a number of preliminary analyses (see Chapter 5), NASA is satisfied that it is feasible to develop housing within the Bay View Planning District. Since the NADP is a programmatic plan, detailed studies and plans for housing in the Bay View would be prepared as part of NADP implementation. To implement a housing program at Bay View (as well as other districts within the NRP), NASA anticipates entering into an agreement with one or more NRP Partners. NASA's Partner(s) would initiate and complete additional, detailed physical analyses as well as prepare economic feasibility studies based upon the then-determined programmatic need and then-current market conditions.

11-7: Please refer to the revised storm drain system presented in Section 4.5 of this Final Programmatic EIS. To function properly, the storm drain systems in Bay View, NRP and the northern portion of the Ames Campus must be integrated components of a complete system. The athletic field/detention pond and the buffer zone/swale that would be constructed in Bay View would serve to detain and filter the storm runoff. These components of the storm drain system would be part of the Bay View improvements and the costs would be allocated to that development. These elements of the system would also benefit the NRP by limiting the flow to the discharge point common to both areas.

The large diameter pipes that would convey runoff away from the NRP, and the sedimentation basin at the discharge point, would directly serve both the NADP projects in NRP and the baseline improvements. These pipes would benefit the entire NRP and the costs would therefore be shared by development partners in that area.

Currently, runoff from NRP impacts the northern portion of the Ames Campus and it will continue to do so if the outfall condition into the Storm Water Retention Pond (SWRP) is left unchanged. The revised system outlined in this Final EIS would not increase the peak discharge into the SWRP. For a description of this system, see pages 4.5-26 through 4.5-28 of this Final EIS.

Although it would be desirable to install the permanent pump station under current or baseline conditions, the development could be implemented without it provided that measures were taken to detain runoff in the undeveloped portions of NRP.

11-8: Preliminary discussions with the Santa Clara Valley Water District (SCVWD) have indicated that coordinating the pumping into Stevens Creek with the water level in the creek would be looked upon favorably by SCVWD. The permanent pump station is a practical way to achieve this goal.

11-9: Raising the finished grade of the new development in Bay View above the expected flood level is the most straightforward design solution for this area and is required by NASA's flood plain regulations.

Another possible design solution would be to allow only parking on the ground floor of all development in Bay View, with living space located above the flood level. NASA discarded this option based on the premise that it is not a good idea to allow residential garages to be inundated; there would also be insurance and liability issues if garages were subject to flooding.

11-10: Please see the response to Comment 2-2 and new Mitigation Measure AQ-7b. NASA intends to consult with the BAAQMD throughout the construction period.

11-11: While the University of California may be exempt pursuant to California Government Code Section 54999 et seq. from exactions and fees levied by nonfederal agencies, it is not exempt from federal statutes related to fees and cost recovery, including but not limited to 31 U.S.C. 9701. Thus, NASA has the authority to levy fees, charges, and assessments in order to recover its costs for expenses and services that benefit NRP partners, including any mitigation costs or pass throughs of negotiated mitigation fees.

NASA will require its NRP partner(s) that develop housing under the NADP to pay school impact fees to impacted school districts on a negotiated basis notwithstanding a partner's statutory legal exemption.

State of California - The Resources Agency
DEPARTMENT OF FISH AND GAME
http://www.dfg.ca.gov
POST OFFICE BOX 47
YOUNTVILLE, CALIFORNIA 94599
(707) 944-5500

GRAY DAVIS, Governor

Flex your POWER

February 7, 2002

Ms. Sandra Olliges
NASA/Ames Research Center
M/S 218-1
Moffett Field, CA 94035
FAX: (650) 604-0680

Dear Ms. Olliges:

NASA Ames Burrowing Owl Habitat Plan
Moffett Field, Santa Clara County

Department of Fish and Game personnel have reviewed the burrowing owl management plan (Plan) for the proposed NASA/Ames Development Plan. The Plan, which is Appendix F of the Draft Environmental Impact Statement for the proposed project, addresses burrowing owl resource issues relating to the development of the Moffett Field NASA/Ames site and the establishment of burrowing owl reserve areas. 12-1

The Department is supportive of the establishment of burrowing owl conservation areas at NASA. These areas need to serve as burrowing owl nesting and foraging habitat, in addition to other undesignated lands at NASA that may serve this function. These proposed conservation areas should be re-evaluated to see if any additional existing nest burrow locations can be incorporated into the design. Protection and conservation of existing nest sites is the most critical factor to ensuring burrowing owl viability on the site and mitigating project impacts to a less than significant level. 12-2

The conservation areas will have specific management needs that need to be addressed before the Department can conclude that impacts have been mitigated to a level of less than significant. The conservation areas should initially be remediated to remove non-habitat material as much as possible. This should include 12-3

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the removal of concrete, asphalt, and other materials and structures. Sites should be restored to owl habitat by providing suitable soil and seeding, as needed, with non-invasive grass species found on the NASA site. Conservation areas and other areas used by burrowing owls at NASA should be mowed at least twice each year during the late winter and spring months to ensure that these areas continue to function as owl habitat. The Plan should clearly state the timing and method of mowing. Vertical structures that may serve as perching sites for predators should be removed or modified to eliminate perching use. 12-3

The conservation areas should also be permanently protected as owl habitat and should include an endowment to fund long-term management. The Department recommends that a conservation easement be placed over the conservation areas, or the lands be transferred in fee title to the Department or another conservation entity acceptable to NASA and the Department. If the establishment of a conservation easement is precluded by existing laws or policies, NASA should enter into an agreement with the Department that stipulates how the lands would be permanently protected if they were transferred from Federal ownership. The Plan should also clearly identify all tasks and costs associated with long-term management and an endowment amount should be developed based on an analysis of those tasks using the Property Analysis Record software or comparable system. The endowment should be placed in a non-wasting account and adjusted upward annually at a rate similar to the rate of inflation. Interest from the endowment should be sufficient to fund all long-term management activities on the burrowing owl conservation areas. 12-4

The Department believes that the incorporation of the above recommendations into the Environmental Impact Statement (EIS) and Plan, the implementation of other mitigation measures already in the EIS and Plan, and the avoidance to the maximum extent possible of closure of existing burrowing owl burrows on the NASA site will mitigate impacts to owls to a less than significant level. The Department encourages these measures be requirements of the project. The Department requests that NASA consult with the Department prior to making any final determination if NASA does not believe it can incorporate these measures as required project conditions.

If you have any questions, please contact Mr. Dave Johnston, Environmental Scientist, at (831) 475-9065; or Mr. Scott Wilson, Habitat Conservation Supervisor, at (707) 944-5584.

Sincerely,

Robert W. Floerke
Regional Manager
Central Coast Region

cc: Santa Clara Valley Audubon Society
22221 McClellan Road
Cupertino, CA 95014

LETTER 12

Robert W. Floerke, Regional Manager, Central Coast Region, Department of Fish and Game, February 7, 2002.

12-1: This is an introduction to this comment letter and requires no response.

12-2: This comment is generally supportive of NASA's proposed establishment of burrowing owl habitat preserves under the NADP.

The comment also suggests a re-evaluation of the habitat preserves. However, NASA has already incorporated the burrowing owls' key historical nesting areas into the habitat preserves identified in the NADP in each development area. Other nesting areas at Ames are currently protected because of on-going land use. By preserving the existing nesting areas along with surrounding habitat, the NADP will help to ensure burrowing owl viability on the site. No further re-evaluation is necessary.

12-3: Concrete, asphalt, and other structures would be removed from the burrowing owl preserve in the NRP (see BIO-10). There are no roads or structures in the Ames Campus preserve. The pavement and structures in the Bay View and Eastside/Airfield will continue to function; owls currently nest around these structures.

The preserve in the NRP will be planted with native grasses in the areas where concrete, asphalt and other structures are removed. Conservation areas would be moved at least twice per year. Vertical structures that may serve as perching sites for predators would be removed or modified.

12-4: The commentor suggests that NASA establish an endowment to fund long-term management of the owl conservation areas. NASA could only do this if it had legislation from Congress authorizing NASA to

establish such an endowment and providing funding for the endowment. Currently NASA has no such authority and is not likely to get it given current economic realities.

The commentor further recommends that NASA place a conservation easement over the owl areas. NASA could do this under its regulations at 14 CFR Part 1204.503, subject to the requirements and procedures stated therein and intends to establish these easements prior to development of each area. In addition, the commentor recommends that NASA transfer the areas in fee title to the Department of Fish and Game (DFG) or another conservation entity acceptable to NASA and the DFG. Given the fact that the areas in question are relatively small, widely separated from each other, and located well within the boundaries of NASA Ames Research Center, excessing/surplusing the land is not a viable option.

Finally, the commentor recommends that NASA enter into an agreement with the DFG that stipulates how the lands would be permanently protected if they were transferred from Federal ownership. This would be an interagency agreement under the Space Act, but it would state that NASA would eventually place a conservation easement over the owl preserves before any land was transferred from federal ownership.

CITY OF SUNNYVALE

The Heart of Silicon Valley

456 WEST OLIVE AVENUE SUNNYVALE, CALIFORNIA 94086 (408) 730-7470

December 19, 2001

Dr. Henry McDonald, Center Director
National Aeronautics and Space Administration
Ames Research Center
Building 2
Moffett Field, CA 94035-1000

Dear Dr. McDonald:

I would like to take this time to request your cooperation in order to ensure that all development proposed for the NASA Ames Research Center is bicycle friendly and encourages the use of bicycles as a form of transportation. Creating bicycle friendly environments is a goal that the City of Sunnyvale has been working towards for a number of years and an issue that is important to many of our citizens. I strongly urge you to consider taking the following actions that have been requested by our Bicycle and Pedestrian Advisory Committee. 13-1

Please require all developers to retain the services of a traffic-engineering firm with specific expertise and experience in designing accommodations for bicycles per the AASHTO and Caltrans design Manuals. This aspect of development is vital to the promotion of bicycle trips and consequently the reduction of vehicle trips through the surrounding community. 13-2

Additionally, please establish a policy to coordinate with the bicycle and pedestrian advisory committees of the surrounding communities, specifically the Mountain View and Sunnyvale Committees, as well as the Santa Clara Valley Transportation Authority (VTA) Bicycle and Pedestrian Advisory Committee. The VTA has lead an effort to encourage the development of cross-county bicycle routes and we would like to see that any NASA Ames Research Park development complements that effort. We would further encourage you to form your own internal bicycle and pedestrian advisory committee to provide a forum for communication and issue resolution. 13-3 13-4

Furthermore, I urge you to adopt the *VTA Bicycle Technical Guidelines* to be used for all new development within the Research Park. This document incorporates best design practices in order to provide safe accommodation for bicyclists in new development, and will ensure consistency in the design and construction of bicycle facilities. 13-5

I truly appreciate your cooperation with the above items. It is important to the bicycle community who lives in or commutes to Sunnyvale that bicycle friendly development be encouraged. Please contact Dieckmann Wolfe, Transportation Planner at (408) 730-2713 or diwolfe@ci.sunnyvale.ca.us with any questions that you may have. 13-6

Sincerely,

Frederik M. Fowler
Mayor

LETTER 13
Frederik M. Fowler, Mayor, City of Sunnyvale, December 19, 2001.

13-1: This is an introductory comment supporting the creation of a bicycle-friendly environment at Ames. Several components of the proposed Transportation Demand Management (TDM) program would support bicycle commuting and cycling on-site. These include the extension of the on-site bicycle network and the provision of a fleet of on-site bicycles.

13-2: NASA cannot require all developers to retain the services of a traffic-engineering firm to ensure proper design of bicycle accommodations. However, the NRP TDM and Design Guide outline specific guidelines and standards regarding bicycle traffic. These guidelines are based on the Valley Transportation Authority's publication, *Bicycle Technical Guidelines: A Guide for Local Agencies in Santa Clara County.* NASA would oversee and ensure that all established guidelines are met by incoming developers.

One of the design goals of the NRP is to create a campus-like feel that reduces vehicle traffic and encourages pedestrian and bicycle traffic. This would reduce the number of cars in the NRP and the surrounding communities and is an important part of the traffic mitigation plan.

Experts in traffic-engineering were hired by NASA to develop well thought out design guidelines and plans for traffic and circulation and traffic demand management. These consultants, Fehr & Peers Associates and Nelson Nygaard, developed the plans based on current standards and best practices established by local agencies. Developers would be required to follow the guidelines and plans described in the EIS, which include extensive detail on the accommodation of alternative forms of transportation.

13-3: Language has been added to Chapter 2 (page 2-24) to state that NASA and its partners would develop and maintain liaison with employees, neighboring employment centers, regional and local ridesharing programs and existing pedestrian and bicycle advisory committees in order to foster strong community relations. NASA would continue to work, as appropriate, with regional projects that could positively affect bicycle accommodation.

13-4: One of the design goals of the NRP is to create a campus-like feel that reduces vehicle traffic throughout the development, and encourages pedestrian and bicycle traffic. Extensive pedestrian paths and bicycle routes are planned. The TMA would establish a formal process for receiving input from people working in the NRP about how to best accommodate pedestrians and cyclists.

13-5: As stated in the NRP TDM, the guidelines used for bicycle accommodation come directly from the *Bicycle Technical Guidelines: A Guide for Local Agencies in Santa Clara County*, published by the VTA.

13-6: This is a closing comment. No response is required.

County of Santa Clara

Environmental Resources Agency
Planning Office

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San Jose, California 95110-1705
(408) 299-5770 FAX (408) 288-9198
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January 17, 2002

NASA/AMES Research Center
Attn: Sandy Olliges
Mail Stop 218-1
Moffett Field, CA 94035-1000

Re: NASA AMES Development Plan
Draft Programmatic Environmental Impact Statement
Comments

Dear Ms. Olliges:

Air Quality

Recommendation for Mitigation of Impacts
Implementation of the Transportation Demand Management(TDM) plan would lessen the impact to the air quality. The County of Santa Clara recommends that off-site mitigations also be considered. For instance, because the increased traffic associated with the proposed project will decrease air quality throughout the Bay Area, planting trees throughout the Bay Area will help to reduce the air quality impacts. 14-1

Biological Resources

Vol. II Pg. 4.9-5 - Loss of Foraging Habitat for Raptors
The draft notes that the majority of habitat is of low to moderate quality, but doesn't state the sources of information in determining this. 14-2 This section also notes that extensive area would be preserved in Eastside/Airfield area and North of Bay View area but doesn't describe how much acreage is being preserved and the specifics of where the preservation areas are located. The EIR should locate the preservation area, state the size, and describe the improvement proposed. 14-3

Vol. II Pg. 4-9.5 - Loss of Jurisdictional Wetlands
The draft notes that development proposed under Alternative 2 could affect 0.3 acres of wetlands in the Bay View area that might qualify for jurisdictional status. Why hasn't this been determined yet? A listing of appropriate mitigation measures for the loss should be incorporated. 14-4

Wetland Preservation/Enhancement
According to the EIR, wetland enhancement mitigations will only be adopted should alternative 2, 3, or 4 be approved. Please describe the aspects of what will be included in such a wetland enhancement plan. 14-5

The County of Santa Clara recommends that a wetland preservation and enhancement plan be adopted regardless of which alternative is adopted. 14-6

Cultural Resources

General Comments

Because the project encompasses such a large area and the proposed alternatives widely vary, it is essential that the historic resource survey work be both comprehensive and up to date. Chapter 5, "Inventory of Historic Resources," indicates that a number of different surveys have been carried out over the years. However, some of the cited sources are ten years old and later work was undertaken in a piece-meal manner. This causes problems when used as a foundation for decision-making with regard to the treatment of resources in the United States Naval Air Station Historic District/U.S. Naval Air Station Moffett Field Central Historic District (Shenandoah Plaza Historic District), as well as the non-designated areas proposed for redevelopment. Decision-making should be based upon current data less than five years old.

The Shenandoah Plaza Historic District nomination is based upon a survey conducted in 1991 of historic resources that were over 50 years of age at that time. It may be that a re-evaluation would assess some previously non-contributing resources, now more than 50 years old, as contributing. In addition, the current nomination seems to focus on the architectural merit of the resources and does not fully take into account their historic significance. These issues pose a problem when the proposed treatment plan for non-contributing resources in the historic district allows demolition (without replacement) to occur without SHPO or NASA staff consultation. Thus, it may be necessary to re-evaluate the National Register nomination and potentially expand the periods of significance. **14-7**

In addition, it was concluded that more than 124 resources in the Ames Campus are ineligible for listing in the National Register (24 of which were identified as being associated with the Cold War Navy P-3 Orion anti-submarine warfare mission). SHPO concurred with the determination for the 24 associated with the Cold War. Did SHPO concur with the determination for the entire collection of resources? All resources determined to be ineligible should be sent to SHPO for concurrence prior to the development of any site-specific plans for the area. It appears the resources that were determined ineligible were more heavily evaluated on the basis of physical integrity and alterations, rather than historic significance. There is a broad historic context outlined in the historic resources document, yet the resources did not seem to be evaluated in this context. Only two identified periods (1930-35 and 1942-46) are represented by the designated resources (no dates provided for Unitary Plan Wind Tunnel Complex and three nominated resources) when the historic context for Moffett Field covers events up to the end of the Cold War. Were the buildings evaluated individually and therefore not considered of "exceptional significance" under Criterion G? They should be evaluated in the context of a potential district(s) or a property that has non-contiguous period of significance, one of which is less than 50 years old. In addition, were resources other than buildings, such as runways, etc., evaluated? A comprehensive understanding of the resources located in the area proposed for redevelopment would be enhanced through GIS mapping of the resources including age, historic use/association, photographs and status/eligibility. **14-8**

The Draft Programmatic Environmental Impact Statement (Volume 1) identifies the Unitary Plan Wind Tunnel Complex as a National Historic Landmark and three buildings determined to be eligible for listing in the National Register (nominated) including the ARC Administration Building (N-200), the 40 by 80-Foot Wind Tunnel (N-221), and the 6 by 6-Foot Supersonic Wind Tunnel (N-226). However, there is no clear indication of how those resources will be treated. The character-defining features of these resources should be analyzed and incorporated into the design guidelines (proposed mitigation measure) for the Ames Campus and a plan developed for their reuse and treatment. Failure to address the reuse and maintenance of these buildings could lead to a significant impact. In addition, the historic context of these facilities must be maintained. Any surrounding construction should be compatible in height, massing, scale, etc. and should not obscure historically open views of the resources. **14-9**

Further, there are no guidelines for the treatment of Hangars 1, 2 and 3. The document states that Hanger 1 is to be leased to an independent, non-profit foundation established by Ames and the cities **14-10**

of Mountain View and Sunnyvale. The continued use/reuse of these hangars is of pivotal importance. How certain is it that the non-profit will be established? Is this the process currently underway? Will the non-profit make use of the entire space inside Hanger 1? How will any potential use impact its historic character? In addition, Hangers 2 and 3 must be maintained in order to avoid adverse impact (abandonment). What is the treatment plan for these hangars? 14-10 14-11

Additional mitigation measures for substantial impacts to historic resources should also be considered, such as the development of educational and oral history programs to interpret the history of Moffett Field and to foster understanding of the site through its historic resources. 14-12

Section/Page Specific Comments

Section 4 - Inventory of Archaeological Resources (Page 23)

The evaluation of archaeological resources was carried out on the basis of an overview and survey conducted in 1991 by Basin Research Associates. The record search should be updated to include any new documents, which may identify resources in the area. 14-13

It was concluded that "the likelihood of finding pristine" archaeological sites is remote." Sites do not have to be "pristine" to be significant. The status of the site should be stated. 14-14

Section 5 - Inventory of Historic Resources

5.1 Contributing Buildings within the Shenandoah Plaza National Register District (Page 25)

The document states that "although a number of the Spanish Colonial Revival-style buildings have distinctive interior elements, only the exterior of the buildings are considered significant in terms of the National Register." However, interior treatment should be considered if altering historic materials or features and spaces that characterize a property regardless of the significance in terms of the National Register. 14-15

Section 6 – Standard Operating Procedures

6.1 Management Goals and Policies for the Shenandoah Plaza Historic District (page 33)

- "Exterior additions of such equipment shall be painted to match existing resources." 14-16

Add: and landscaped to minimize visual impact.

In addition, the State Historical Building Code should be used when planning for structural stability or the installation of protective or code required mechanical systems or access. 14-17

- Add: sidewalks, driveways, and streets.
- Add: physical evidence.

6.2 National Register Resource Treatment Categories for the Shenandoah Plaza Historic District (Page 34)

It is clear that there is the need to understand how to approach the treatment of the resources in the historic district. However, care should be taken when following the approach of treating buildings, structures, sites and objects in the historic district differently. The word "resource" should be viewed as the entire district, not as individual resources within the district. What is the potential cumulative impact on the district of applying different treatment standards to resources? 14-18

Category II – New Additions (Page 36)

Additions should still be located on secondary facades.
Consider as an alternative, restoring those facades that have been previously altered. 14-19

Category III – Treatment (Page 36)

Major alterations even to non-contributing buildings would have an impact on the historic district as a whole. A threshold can be established regarding what is a "major alteration." 14-20

Any demolition, even without a replacement building, should be flagged. The buildings that are currently considered non-contributing may not be so in perpetuity. An evaluation should be conducted on each building before a demolition is approved. A new evaluation may not be necessary if the information on file is current, within the last five years. Due to the 50-year threshold criteria every five years buildings not previously examined should be studied to reassess their significance to the historic district. 14-21

Category IV – Treatment (Page 36)
The viability of this category seems questionable. The historic resource surveys that have been conducted outside the designated historic district do not seem to be complete or comprehensive, and should not be used to dismiss the resources remaining on the site. 14-22

6.3 Lease or Transfer of Historic Properties (Page 37)
Will NASA have qualified staff to make knowledgeable decisions regarding the appropriate treatment of historic resources? What is the definition of "adjacent"? Whether or not a building is adjacent to a Category I or II building, modifications or improvements should not be approved that do not meet the Secretary of the Interior's Standards. 14-23 14-24

Appendix A - Actions Not Requiring Further Consideration

1. *Architectural Elements*

B. Footings, Foundations, and Retaining Walls
Add: Match profile of original mortar joint when repointing.

C. Glass
It may not be appropriate to replace any type of broken glass with a clear glass of similar thickness. Any replacement should be made with in kind glass (i.e. clear, frosted, smooth, textured, etc.).

2. *Exterior Surfaces*
Add: No change of exterior material. 14-25

3. *Utility Systems*
Acceptable if installation, replacement, removal does not affect character-defining features.

- *New Materials*
Acceptable if installation does not affect the historic integrity of original materials or character-defining features. It may not be appropriate to install carpet over historic linoleum or hardwood.

6. *Ground Disturbing Activities*
Match resurfacing materials in-kind.

Housing

Housing impacts of the NADP were compiled from data from MTC's Commuter Forecasts for the San Francisco Bay Area 1990-2020. Commuter forecasts for the year 2010 were used, since this date reflected the closest year available to the projected NADP build out date of 2013.

MTC data showed that housing impacts are very broad, and the project will draw commuters from all over the Bay Area as well as trips from beyond the region. However, the majority of commute trips will originate from within Santa Clara County. 14-26

Housing provided would be primarily medium to high-density housing and restrictions would be imposed on a percentage of units to ensure availability to on-site employees, faculty and students.

All proposed NADP project alternatives would create significant housing impacts. Alternative 5 would result in less impact since it would generate less demand for housing than the other alternatives

proposed. This alternative would also generate the least amount of cumulative housing impacts of all the alternatives proposed. The County agrees with the applicant's conclusion that Alternative 5 is the preferred alternative. Additional housing should be included as a part of the NADP to further reduce cumulative housing and related traffic impacts. The goal should be the provision of sufficient housing to balance the housing needs of persons employed in jobs generated by the NADP. The project should mitigate its housing demands. 14-26 14-27

Resources and Recreation

The Bay Trail

During the EIR public scoping meeting, the public was informed that NASA is in the process to allow the bay trail to expand. What is the process for the expansion of the Bay Trail? When is construction of the Bay Trail estimated to commence? What are the potential environmental impacts of the Bay Trail expansion? 14-28

The County of Santa Clara recommends that the portion of the Bay Trail, which is on the NASA Ames campus, be completed within 2 years of the date of approval of the final EIR. Bicycle and Pedestrian connections to the Bay Trail should also be completed during the construction of the Bay Trail. 14-29

Sustainable Development

During the EIR public scoping meeting, it was discussed that the NASA Ames development will include many sustainable development provisions. However, the details of sustainable development measures were unknown. Please describe how the presence of significant impacts in air quality, traffic, and housing fall within goals of sustainable development. Please describe what sustainable development measures will be implemented in the NASA Ames campus. 14-30

Traffic and Circulation

Various Countywide expansions of VTA light rail are in progress that will increase rail access to the NASA-Ames site. These expansions will provide light rail access to the site from eastern San Jose (Capitol Expressway line), the Los Gatos area (Vasona line), and Milpitas (Milpitas line). The increased availability if light rail will enhance the viability of proposed TDM proposals in the NADP.

Hwy 101, 237, 85 – significant impacts from all alternatives for peak hour volumes on these highways at nearby locations. Further widening of these highways is infeasible due to the proximity of existing development and right of way constraints. In addition, large-scale freeway widening projects are beyond the scope of a single development. We agree this is a significant, unavoidable impact if implemented as proposed. However, this outcome should not be embraced as an acceptable outcome. 14-31

Reconstruction of 101/85 interchange is funded and will begin construction in 2002 with an estimated completion date in 2005. This project will provide for better traffic flow between these highways in the immediate vicinity of the NASA-Ames site. 14-32

Proposed mitigations include improvements on nearby surface streets and intersections, which would reduce certain traffic impacts to a less than significant level. The County supports inclusion of these mitigations as part of the proposed project. 14-33

Circulation proposals include TDM initiatives, including proposed on-site parking charges, and increased shuttle service to connect riders with light rail and Caltrain. The County supports inclusion of these TDM proposals and recommends the project commit to a higher % of trips to be 14-34

accommodated through TDM measures. Yearly monitoring should occur and if that % is not met then expansion will halt until the % is reached. 14-34

According to the EIS, Alternative 5 would result in the lowest amount of project trip generation, with the inclusion of additional on-site housing and TDM trip reductions. The County supports the selection of Alternative 5 as the preferred alternative. 14-35

If you have any questions, please contact Amber Grady at 408/299-5779.

Sincerely,

Ann Draper
Planning Director

: Hugh Graham
Derek Farmer
Zachary Goldberg
Amber Grady
Colleen Oda
Dana Peak

LETTER 14

Ann Draper, Planning Director, County of Santa Clara, January 17, 2002.

14-1: NASA proposes an aggressive TDM Program designed to reduce air quality impacts. Off-site mitigations, such as planting trees throughout the Bay Area, would not be feasible.

14-2: The California Department of Fish and Game's Wildlife Habitat Relationships System (WHR) describes foraging habitats and prey species for raptors, including white-tailed kite, northern harrier, golden eagle, and bald eagle.[3] The quality of habitat for foraging raptors is dependent on the abundance and diversity of prey species found within them. The non-native grassland and weed-dominated habitats found at Ames Research Center are dominated by non-native species including large expanses of weedy species such as bristly ox-tongue (*Picris echiodes*) and scattered geranium (*Geranium dissectum*). The presence of these exotic species often displaces native species of plants and animals, decreases diversity, and alters habitat structure, which in turn leads to decreased supply of prey animals.[4] Thus, the presence of many ruderal species is equated with low densities of prey species and therefore decreased quality in foraging habitat for raptors.

14-3: Areas that are to be protected, including preserves and open space are detailed for each alternative in Chapter 2 (Description of Alternatives). These areas are protected from development based upon their land use designations, which include open space, wetlands, and preserve.

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[3] California Department of Fish and Game. 2000. California Wildlife-Habitat Relationships. Available at http://www.dfg.ca.gov/whdab/html/index.html. Accessed August 2001.

[4] Bossard, C.C., J.M. Randall, M.C. Hoshovsky. 2000. *Invasive Plants of California's Wildlands*. University of California Press, Berkeley.

Location of these areas, as well as their acreage, are included in Figures 2-1 through 2-6, and in corresponding Tables 2-5, 2-7, 2-9, 2-11 and 2-14. In addition, there are 134 hectares (330 acres) of wetlands that will remain undeveloped.

14-4: The wetland delineation report was verified in March 2001 and finalized in May 2001. The final verification of the wetland delineation (May 2001) determined that the 0.1 hectares (0.2 acres) of the 0.1 hectares (0.3 acres) of potential wetland that may have been impacted by development in Bay View did not qualify for jurisdictional status. As a result, the development of Alternatives 2 and 4 would no longer impact jurisdictional wetlands. The date of verification, a description of jurisdictional waters of the United States, including wetlands, and a revised impact analysis are included in Section 3.9.C, Figure 3.9-3, Section 4.9, and the wetland delineation report in Appendix E. Since no impacts to jurisdictional waters or wetlands are expected, no mitigation would be required.

14-5: A wetland enhancement mitigation measure plan (Mitigation Measure BIO-2b) has been included in this EIS to help mitigate Impact BIO-2, which addresses wetlands impacts. This impact applies to Alternatives 2 and 4 only because the parcels proposed for construction in these alternatives are closer to wetlands than in any other alternative, increasing the potential for construction runoff into the wetlands. This impact would not occur under Alternatives 1, 3, or 5 because these alternatives either do not propose development in the Bay View area or are set back sufficiently to avoid impacts to wetlands.

Mitigation Measure BIO-2b states that, if needed, the wetland enhancement plan would be developed in conjunction with the US Army Corps of Engineers and Regional Water Quality Control Board. Specific mitigation actions to comply with the Clean Water Act would be developed at that time. They may include installation and

maintenance of silt fencing and placement of hay bales and/or straw wattles at the edge of construction sites.

14-6: Wetland preservation is incorporated as part of this action through the land use designation "wetland" included in all five alternatives. Wetland enhancement is also included for Alternatives 2 and 4 as discussed in the response to Comment 14-5, but is not required for Alternatives 1, 3, or 5 because these alternatives are set back sufficiently to avoid impacts to wetlands. The commentor's recommendation to develop a wetland enhancement plan regardless of which alternative is not within the scope of the project.

14-7: NASA has prepared an Historic Resources Protection Plan (HRPP) (included as Appendix G of the EIS), which will form the basis of a Programmatic Agreement with the California State Historic Preservation Office (SHPO).

The HRPP is based on a number of surveys evaluating Historic Resources conducted during the past five years. These include the following:

- *Historic Archeological Resources Plan,* 1996 NASA.
- *Inventory and Evaluation of Cold War Era Historical Resources Moffett Federal Airfield NASA Crows Landing Flight facility,* Alexandra C. Cole, SAIC, 1998.
- *Beyond Buildings Building Re-evaluation for Various Buildings at Moffett Field,* Lorie Garcia 2001.
- *Building Evaluation Report,* Architectural Resources Group 2001.

These surveys evaluated buildings and structures at Moffett Field consistent with criteria A, B and G as referenced in the *National Historic Preservation Act.*

Non-contributing buildings in the Historic District have been evaluated subsequent to the 50-year threshold of eligibility. The architectural and historic resources associated with these non-contributing buildings remained unchanged from previous evaluations. No further re-evaluation of buildings or significance is necessary.

14-8: Information regarding NASA's findings regarding ineligibility for listing of all non-contributing buildings in the NRP and the Eastside/Airfield areas outside the Shenandoah Plaza Historic District have been submitted to SHPO for concurrence in the HRPP. Resources were evaluated for eligibility under criteria based on the recommendations of the *Secretary of the Interior's Standards for Preservation Planning and Identification* and the Advisory Council on Historic Preservation's *Balancing Historic Preservation Needs with the Operation of Highly Technical or Scientific Facilities.* Resources were evaluated using criteria A, B, C and G.

Buildings N-205, N-206, N-207A, N-208, N-209, N-218A N-222, N-223 were evaluated in 2001. All were determined to be non-contributing resources. The Unitary Wind Tunnel was nominated in 1990 and is listed as a national historic landmark. The three buildings in the Ames Campus, N-200, N-221, and N-226, are in the process of nomination. Buildings were evaluated using criteria A and B, for the period 1933 to 2001. All support structures and resources associated with the airfield were evaluated. The runways were not evaluated.

14-9: Buildings N-200, N-221, and N-226 were nominated using criteria A (associated with events that have made a significant contribution to the broad patterns of history), and C (embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possesses high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinctions). Reuse design guidelines for the

Ames Campus buildings would be established. View corridors are addressed in AES-3.

14-10: Re-use guidelines for Hangar 1 have been established in the *Re-Use Guidelines for Hangar 1*[5], which have been submitted to the SHPO for approval as part of the HRPP. Compliance with the HRPP is required as part of Mitigation Measure CUL-2. The non-profit California Air Space Center (CASC) has been created and a Memorandum of Understanding with NASA has been signed by the CASC Board of Directors. The CASC will encompass the entire area in Hangar One, as is consistent with the SHPO-approved re-use guidelines.

14-11: No change in use is proposed for Hangars 2 and 3 in Mitigated Alternative 5, the Preferred Alternative.

14-12: The development of educational and oral history programs for the site will be incorporated into the CASC.

14-13: Page 3.13-2 of this Final Programmatic EIS has been amended to indicate that a record search has indicated that no new studies have identified archeological resources at ARC since 1991.

14-14: Sites do not have to be "pristine" to be significant. The archeological records do not indicate any additional significant sites beyond what has previously been identified.

14-15: This management goal will be adopted. Elements for interior treatment have been incorporated into the HRPP. See Appendix I of the HRPP, which is Appendix G of this EIS.

[5] Page and Turnbull, 2001.

14-16: The commentor's suggestion has been incorporated into Mitigation Measure CUL-2 in this Final Programmatic EIS.

14-17: NASA would use the State Historical Building Code when planning for structural stability or the installation of protective or code required mechanical systems or access. The commentor's suggestion has been incorporated into Mitigation Measure CUL-2 in this Final Programmatic EIS.

14-18: Treatment of resources in the Historic District will be viewed from the perspective of the entire district and will be protective of historic properties. No adverse cumulative impact is expected to occur.

14-19: The commentor's suggestion has been incorporated into Mitigation Measure CUL-2 in this Final Programmatic EIS.

14-20: NASA does not intend to conduct major alterations to non-contributing buildings in the Historic District. As stated on page 36 of the HRPP, "exterior alteration of Category III buildings within the district, in close proximity to Category I or II buildings, or their demolition and replacement with new buildings, constitute actions that will trigger Section 106 requirements, except as noted in Appendix A of the HRPP".

14-21: NASA has prepared resource evaluations in the form of closure plans for buildings being considered for demolition. Each closure plan contains the Form DPR 523 for the building, which is an evaluation regarding historic resources. If there has been a significant change in the historic context of the building, when demolition actually occurs, then the HRPP requires that a re-evaluation be considered.

14-22: Surveys outside the Historic District have been completed in the remainder of the NRP, and in the Eastside/Airfield areas. Surveys have been completed in the Ames Campus for all buildings that are 45

years old. Additional surveys will be conducted in the Ames Campus and Bay View areas as additional buildings approach 45 years of age. Please refer to Chapter 8 for references.

14-23: NASA has a Historic Preservation Officer on site who is qualified to make evaluations regarding the appropriate treatment of Historic Resources.

14-24: Adjacent is determined by the context of the building and would be determined by a professional historic architect in consultation with the SHPO.

Modifications and improvements to all buildings in the District will be subject to the Secretary of Interior's Standards.

14-25: The commentor's suggestion has been incorporated into Mitigation Measure CUL-2 in this Final Programmatic EIS.

14-26: This comment correctly states that MTC Commuter Forecasts data were used to evaluate housing data and summarizes several points that resulted from this evaluation. The comment also states that the County concurs with the conclusion that Alternative 5 is the Preferred Alternative. No response is required.

14-27: With the implementation of Mitigation Measure SOCIO-1b, which has been added to this Final Programmatic EIS, NASA has added additional housing to provide 1,120 townhome and apartment units in the Bay View area, and 810 student apartment and dormitory units in the NRP area. If this level of housing development could not be achieved, NASA would commensurately scale back the employment and student generating component of the project. Housing in the NRP area would be constructed in a portion of Building 19, Building 20 and on Parcel 6. In the Bay View area, housing would be constructed on Parcel 1. See Chapter 5 for a full analysis of the

additional housing that would result from the implementation of SOCIO-1b.

NASA continues to work with the Army on obtaining the use of some of its existing on-site housing, as specified in Mitigation Measure SOCIO-1a of this Final EIS.

Also, as described in SOCIO-1c, NASA would continue to evaluate the feasibility of constructing housing over retail uses in the NRP.

14-28: One of the planning principles to which NASA committed during the preparation of the DPEIS was that none of the proposed development activities would preclude the construction of the Bay Trail along the property boundaries of Ames Research Center. A potential alignment for the Bay Trail along the perimeter of NASA's property is represented in many of the maps in the EIS. However, while NASA is committed to enabling the completion of the Bay Trail through granting an easement of its construction, the construction of the Bay Trail will not be done by NASA, is not a part of this proposed development, and has therefore not been studied as part of this EIS.

In January, 2002, NASA and the Association of Bay Area Governments (ABAG) signed a Memorandum of Understanding (MOU) that establishes a planning framework under which the two organizations will work to identify a preferred alignment for the trail, understand environmental and operational requirements, and discuss schedules and terms of agreements. As a result of these activities, it is anticipated that NASA will grant an easement along its boundaries on which the Bay Trail can be constructed. Construction of the Bay Trail, and appropriate studies for potential environmental impacts, will be the responsibility of an entity to be identified as part of the planning process organized by ABAG and its partner organizations.

14-29: At this point in time, there is no estimated date for the start of construction of the Bay Trail. This date will be determined by the ABAG based on their planning activities with NASA and their partner organizations.

14-30: The proposed project would implement various measures that would assist NASA towards its commitment to sustainable development goals. These include the following:

- Adherence to an aggressive TDM program such as the one described on pages 2-27 through -29 of the EIS.
- On-site housing and pedestrian-oriented development, bicycle lanes and bicycle parking facilities.
- Water conservation measures such as low flow fixtures, minimized landscaping and maximizing the use of California native plants which are adapted to the Bay Area climate.
- Uses of reclaimed water which would serve the NRP for irrigation purposes.
- Techniques for constructing energy-efficient buildings, as outlined in the Design Guide for the NADP.
- Establishment of burrowing owl preservation habitat areas.
- Continuation and improvement of recycling and composting programs.
- LEED certification of all new buildings.

These measures and their relationship to sustainability are described in more detail on page 2-21 of the Final Programmatic EIS.

14-31: This comment concurs with the conclusion in the EIS that there would be significant, unavoidable impacts from all alternatives for peak hour volumes on Highways 101, 237 and 85, and expresses the

opinion that these impacts should not be embraced as an acceptable outcome. No response is required.

14-32: This comment provides additional background on the reconstruction of the Highway 101/85 interchange. This reconstruction has been accounted for in the EIS traffic analysis (see Section 4.3). No response is required.

14-33: This comment expresses support for proposed mitigations for improving nearby surface streets and intersections. No response is required.

14-34: This comment suggests a higher TDM trip reduction for the project. With the additional housing as proposed in the Mitigated Alternative 5, the overall trips reduction would increase to 55 percent from 46 percent.

Yearly monitoring and penalties if percent reduction is not met are described in the TDM plan in Appendix B.

14-35: This is a comment expressing support for Alternative 5 as the Preferred Alternative. No response is required.

CITY OF SUNNYVALE

The Heart of Silicon Valley

456 WEST OLIVE AVENUE SUNNYVALE, CALIFORNIA 94086 (408) 730-7470

January 17, 2002

Ms. Sandy Olliges
NASA Ames Research Center
Mail Stop 218-1
Moffett Field, CA 94035-1000

SUBJECT: **NASA Ames Development Plan Draft EIS Comments**

Dear Ms. Olliges:

Thank you for the opportunity to review the NASA Ames Development Plan Draft Environmental Impact Statement, dated November 2001. As you know, the City Council discussed this issue at the January 15 meeting, and expressed a strong commitment to the NASA Ames Development Plan, which is in accordance with the recommendations of the 1997 recommendations of the Community Advisory Committee. 15-1

The City understands that the project will not be competitive with economic development initiatives in Sunnyvale. Our concerns center on the need for adequate mitigations for impacts to ensure that quality of life as well as development will not be restricted because of cumulative negative impacts – primarily on traffic, air quality, the jobs-housing balance.

Alternatives 2, 3 and 4 are not acceptable to Sunnyvale because of the higher intensity development, proposed development in the East Airfield and the higher number of significant unavoidable impacts. 15-2 The preferred alternative 5 is the only alternative that is acceptable. However, the City finds the EIS inadequate because it did not take into account the cumulative impacts and there are still significant impacts that remain unmitigated. 15-3

In summary, the City believes the following areas need additional clarification or mitigation in the EIS:

1. The cumulative impacts are understated because the EIS does not take into account adopted plans, pending projects and current plan revisions (e.g., Moffett Park Specific Plan). 15-4

   Recommendation: Revise the report and tables to include the cumulative impacts of all projects, including proposed plan revisions.

2. The proposed Traffic Demand Management program is a critical and supported mitigation, but it falls far short of mitigating the cumulative impacts of the proposed project on the transportation system.

   Recommended Mitigation Measure: NASA shall cooperate with adjacent municipalities, Santa Clara County and regional agencies in determining the projected cumulative impact of development on the transportation system. NASA shall contribute its fair share (equivalent to the contribution of similar development in adjacent cities) to fund the implementation of regional transportation infrastructure improvements. I5-5

3. The EIS states that alternative 5 will create 7,222 new jobs (and attract an unspecified number of students) requiring a minimum of 3,930 new housing units. On-site housing is providing only 1,040 housing units, thereby exacerbating the present regional jobs/housing imbalance. I5-6

   Recommended Mitigation Measure: NASA shall cause housing to be constructed off-site to accommodate its increased demand for housing and/or contribute to the housing mitigation funds of adjacent communities.

4. The EIS does not adequately analyze the cumulative impact on the sanitary sewer conveyance to the Water Pollution Control Plant.

   Recommended Mitigation Measure: NASA shall cooperate with the City of Sunnyvale in determining the cumulative impact of development on the sanitary sewer system and shall contribute its fair share toward construction of conveyance pipes and supporting infrastructure which are determined to be regional to mitigate the cumulative impact. I5-7

Detailed comments are provided as an attachment to this letter. The City Council also directed staff to continue to work with NASA to provide the information needed, discuss deficiency areas and finalize mitigations for the Final EIS. Please contact Karen Davis in Economic Development at (408) 730-7628 kdavis@ci.sunnyvale.ca.us to discuss this information further.

Sincerely,

Frederik M. Fowler
Mayor

cc: Trish Morrissey, NASA Ames Research Center
Linda Forsberg, City of Mountain View
City of Sunnyvale City Council
Robert Paternoster, Community Development Director,
City of Sunnyvale
Marvin Rose, Public Works Director, City of Sunnyvale
Ernie Bakin, Public Safety Director, City of Sunnyvale
Robert Walker, Parks and Recreation Director, City of Sunnyvale
Robert S. LaSala, City Manager, City of Sunnyvale

Attachment

Community Development Planning Division

1) The Draft EIS does not adequately address the City's pending Moffett Park Specific Plan (MPSP) in the cumulative impact analysis. The EIS cumulative impact analysis only includes projects in the city that are already entitled. Alternatives 1 and 2 of the MPSP would allow up to 28.8 million square feet, where 18.6 million square feet is currently allowed. Staff anticipates that the MPSP and the EIR will be acted upon in mid 2002. Unmitigated impacts from the NASA Ames Development Plan (NADP) could severely impede the ability of the City of Sunnyvale to support future development in the Lockheed/Moffett Park planning area. Discussion and analysis of alternatives in the MPSP must be included in the cumulative impact analysis. **15-8**

2) The EIS does not include Sunnyvale's General Plan, Land Use and Transportation Element (LUTE) transportation mitigations and capital improvements. The NADP will have significant impacts on major intersections, and minor highway intersections and local streets in the city. The EIS does not address how or if current planned improvements will need to be modified, or if their implementation will need to be accelerated. The City has existing plans for improving these intersections (see Attachment B, LUTE figures D-1 to E-1). The LUTE and Lockheed Master Use Permit and EIR include the Mary Avenue Extension as a required mitigation for traffic. The EIS only includes one transportation improvement in the future cumulative analysis, the redesign of the Highway 101/SR85 interchange. It does not include projects that are not funded. For example the Mary Avenue Extension is discussed but not included in the future cumulative analysis since it is not funded (page 3.3-39). The General Plan assumes that as many as seven major roadway capital improvements are needed now, plus minor intersections and capital improvements. For example, the cost of a one major capital improvement such as a grade separation is 75 million dollars. **15-9**

NASA should cooperate with adjacent municipalities, Santa Clara County and regional agencies in determining the projected cumulative impact of development on the transportation system. NASA should contribute its fair share (equivalent to the contribution of similar development in adjacent cities) to fund the implementation of regional transportation infrastructure improvements. **15-10**

Preferred alternative 5 identifies three significant unavoidable impacts (CIR-1, AQ-1, SOCIO-1). Two partial mitigations are proposed: a traffic demand management program and on-site housing. Highway road widening is considered infeasible due to right of way constraints and the proximity of existing buildings and structures (page 4.3.30). Bicycle circulation is currently considered problematic on Ellis Street and Manila Drive/Moffett Park Boulevard to Mathilda Avenue (page 4.3.27). Although intersection improvements are proposed, adding a lane to Moffett Park Boulevard is considered infeasible. For alternatives 2 through 5 there are a total of 11 significant unavoidable circulation impacts identified. One significant unavoidable impact, air quality, results from vehicle uses and population projections that are inconsistent with Bay Area Air Quality Management District significance **15-11**

thresholds (page 0-17). To meet the standards development could be phased to meet annual thresholds, which is discussed in the EIS. 15-11

3) The Lockheed Master Use Permit allows 6.25 million square feet (26% floor area ratio) buildout on the 555 acre site, or 4,350 peak hour vehicle trips, whichever is greater to year 2015. The Lockheed Master Plan and EIR data need to be incorporated into the EIS. 15-12

4) The City does not support development of the fire training facility or the two disaster training centers in the Eastside/Airfield area proposed in alternatives 2 and 4. The EIS must consider and discuss the impact these alternatives would have on the City's future development of this site, in the case that an alternative other than the preferred alternative is selected. Allowing these types of facilities to be developed in the Eastside/Airfield could preclude redevelopment of these areas at some future date by the City. The City requests that the fire training facility on the Eastside Airfield be eliminated from all alternatives since it is not relevant to the NASA Ames R&D campus. The City does not oppose the development of a disaster training facility, but has concerns about the identified site in alternatives 2 and 4. 15-13

5) The eastern sanitary sewer system (including the NASA Research Park (NRP), Eastside/Airfield and California Air National Guard (CANG) currently discharge to the City of Sunnyvale sewer system. This Fall a preliminary model indicated that sewer flow tests are needed as the sanitary sewer main is already at capacity. A flow study is necessary to determine if the development proposed in the NADP would have a potential negative impact. 15-14

The Sunnyvale Water Pollution Treatment Plant (SWPCP) capacity is 29.5 million gallons per day (mgd) and existing cumulative loads are only 16.5 mgd (page 3.5.14). The EIS states that there is adequate capacity for the NASA Ames facilities. The pump station for the sewer line is noted as needing replacement in the near future. Any development which impacts the pump station needs to provide appropriate mitigation. 15-15

The City must reserve some of the sewer line and plant capacity for the maximum build out levels being considered in the Moffett Park Specific Plan. There are no plans to expand the sewer facility. All future and cumulative development requiring sewer and SWPCP facilities must be included in the EIS and appropriate mitigations identified for infrastructure impacts. NASA should contribute its fair share toward new construction costs for supporting infrastructure. 15-16

Community Development Housing Division

6) The EIS notes that the project will adversely impact the jobs/housing balance and only proposes a partial mitigation for the regional impact on housing resources through on-site housing for students and employees associated with the education research facilities. The project should more fully mitigate this impact by providing an off-site housing construction and/or contributing to housing mitigation funds of adjacent communities. 15-17

7) The EIS has insufficient data to analyze the impact of the NADP development on existing housing. The analysis needs to include data on new employee's income compared to new and existing housing stock. For example, what percentage of the employees generated are below-low, low, and moderate incomes? The study needs to consider the housing impact for service sector workers as well as all levels of income associated with the jobs generated. A 15-18

breakdown of projected employee income including for very-low, low and moderate of median income categories is needed to determine the affordable housing impact. Further analysis is needed to determine the potential impacts to the jobs/housing balance and to determine appropriate mitigations fees. 15-18

8) The best alternative generates approximately 7,222 new jobs (and attract an unspecified number of students) requiring a minimum of 3,930 new housing units according to their analysis. On-site housing is providing only 1,040 housing units, thereby exacerbating the present regional jobs/housing imbalance. Alternative 5 will generate a lower household demand in the Housing Impact Area (Metropolitan Transportation Commission's Superdistrict 9, based on Bay Area commuter forecasts, page 3.14.11) and provides a higher ratio of housing to new households (page 4.14.4) than alternatives 2, 3 and 4. NASA should cause housing to be constructed off-site to accommodate its increased demand for housing and/or contribute to the housing mitigation funds of adjacent communities. 15-19 15-20

Department of Parks and Recreation

9) Alternatives 2 through 4 (page O-4) include the development of a regional disaster training facility adjacent to the golf course. This will conflict with the future viability or expansion of the golf course facility, included in the City's Recreation Sub-Element of the General Plan goals and policies. 15-21

10) Alternatives 2 through 4 (Recreation Impacts Recommendation 1, page O-33) would not provide enough new recreation. Mitigation is needed to develop additional on or off-sit active recreation areas. 15-22

11) Alternatives 2 and 4 (page O-33 - Recommendation. 2) would result in removal of one hole of the golf course for development of the regional disaster training center. Mitigation would be needed to reconfigure golf course to provide 18 holes. This could impact the playability of golf course and preclude potential expansion of the golf course. 15-23

12) Alternatives 2 through 4 (page 2-19) include plans for several developments that will potentially impact the golf course facility including plans for a disaster training facility adjacent to the golf course. Figure 2.2 - It appears that an ordnance storage area that seems to be located in the middle of the golf course may be expanding. Is it getting larger and also taking up a part of the golf course? What will be the impacts of a disaster training facility adjacent to the golf course (noise, odors, smoke, equipment, etc.)? The extension of the Bay Trail if it occurs, is also adjacent to the golf course. Is there enough area to allow a safe separation of the trail and the golf course? 15-24 15-25

Department of Public Safety

13) Increased traffic impacts from any of the alternatives will negatively impact the response times of the City of Sunnyvale's emergency services. Increased traffic impacts as a result of the NADP development would require mitigation for emergency services. 15-26

Although the fire services are provided on the NASA Ames site through an agreement with the California National Air Guard (CANG), Ames Research center has a cooperative 15-27

agreement as part of the Santa Clara County Fire Mutual Aid service (page 3.6-1). The closest mutual aid fire station for the NASA Ames area is the City of Mountain View. Law enforcement is provided for Ames Research Center, but the NRP areas that become open to the public will require services. The EIS does not state who would provide these services to the NRP (page 3.6-2). 15-27 15-28

An analysis is needed to determine the impact of each of the NADP alternatives on response times, mutual aid requests for services, equipment and facilities, for both police and fire. Appropriate mitigation measures need to be identified. 15-29

Public Works Utilities

14) Water

The water system on the development site is owned and operated by NASA Ames from a turnout at the SFWD (Hetch-Hetchy) system. Therefore there is no impact on the City system. 15-30

15) Reclaimed Water

The City of Sunnyvale has a 24-inch reclaimed water main along the Moffett easterly boundary. This facility is available for irrigation water for the development and the golf course. This would lessen demands for potable water from the SFWD. The Water Pollution Control Plant (WPCP) encourages and strongly supports the expansion of the recycled water distribution system within existing and potential new development areas for the NADP facilities. The increased use of recycled water will help to offset some of the potable water demands as well as reduce quantities of treated effluent flow to the South Bay. The expansion of the recycled water lines may not necessarily be a mitigation measure for the recycled water usage as per the Standards of Significance listed in this section. However the expanded use of recycled water throughout this facility could be considered as a mitigation factor for other impacts to the potable water system and Water Pollution Control Plant operated by the City (Volume II, Chapter 4.5 (B)). 15-31

16) Sanitary Sewer

The WPCP disagrees with the assessment for Alternative 5 that treatment capacity of the plant is not an issue, especially when the NADP flows proposed are considered in addition to the cumulative development projects listed for the City of Sunnyvale (Volume II, Chapter 4.5 (C)). Though the NASA Ames project itself would only add 0.85 million gallons per day (mgd) flow to the WPCP, the cumulative projects listed in the EIS would increase the flow by 7.79 mgd. If the proposed cumulative load to the WPCP of 25.3 mgd were reached, it would automatically trigger a plant design and expansion review as per USEPA guidelines, based on the Plant's total capacity of 29.5 mgd. This could have a significant impact on the capital and operating costs of Sunnyvale's WPCP. 15-32

The EIS states that the existing sewer pump station that discharges into the Sunnyvale system has a capacity of 2,000 gallons per minute(gpm) which exceeds the peak flows from any of the single alternatives listed (Volume II Chapter 4.5 (C)). Has the capacity of the pump station been considered in light of the cumulative projects listed for Sunnyvale in Appendix C, Tables 3.6A and 3.6B of the draft EIS? Is there potential impact to the capacity of the pump station of the NADP development in addition to approved and future development 15-33

potential in the Moffett Park Specific Plan? Even if the pump station is "nearing the end of its useful life" as stated in the EIS, costs to the City for replacement or resizing of this pump station could have an impact on capital and operating costs for the City's sewer system. This issue needs to be analyzed to determine if there is a potential impact to the system. 15-33

The easterly portion of the NADP site is currently and will continue to be sewered by the Sunnyvale operated Lockheed/Moffett trunk sewer and the Sunnyvale Water Pollution Control Plant. The trunk sewer leading to the WPCP may possibly be nearing capacity due to the cumulative impact of surrounding developments and ground water infiltration. We recommend a flow metering study of the 36-inch trunk sewer within Caribbean Drive in order to assess its current usage and to gauge its ability to carry additional flows. This monitoring may be performed in collaboration with a proposed development project within the Lockheed Campus area. 15-34

The existing sewage lift station on the Moffett Site has a maximum potential discharge of 1,700 gallons per minute (2.5 mgd) as a pipe flow rate. Any significant increase in effluent to the City of Sunnyvale WPCP may create the need for additional trunk sewer capacity and a pro rata contribution for the cost of additional sewer capacity. 15-35

It is stated in the Draft EIS that Impact INFRA-1 is applicable only to Alternatives 2 through 4 (Volume II Chapter 4.5 (C) 3, Impact INFRA-1). Given that the sanitary sewer conveyance to the Sunnyvale WPCP is at or near capacity with the cumulative projects listed in Appendix C, Tables 3.6 A and 3.6B of the Draft EIS, Alternative 5 would potentially impact the plant. Mitigation measures should include a fair share contribution toward the installation of new conveyance piping to the Sunnyvale WPCP if Alternative 5 is selected. 15-36

It is recommended that wastewater reclamation and reuse for non-potable purposes be expanded to minimize additional discharge to the City WPCP through the potentially impacted trunk sewers. 15-37

17) Storm Drainage

The City of Sunnyvale is a co-permitee with other communities and agencies of the Santa Clara Valley Urban Runoff Pollution Prevention Program's NPDES Stormwater Discharge Permit. In October 2001, the Bay Area Regional Water Quality Control Board adopted Order 01-119 as an amendment revising Provision C.3 of Order 01-024. The "C.3 Provision" amendment places some significant requirements on co-permitees to implement reductions in pollutant load, volume, and velocity in storm water runoff. The proposed property developments should abide by the same requirements for the implementation of storm water quality control measures both during and after construction with which all adjoining cities and the Water District must comply (Volume II, Chapter 4.5 (D)). These would include (but not be limited to): 15-38

- Minimize post-development pollutant loads from a site to the maximum extent practicable
- Size storm water treatment Best Management Practices (BMPs) and structures appropriately so that detention/retention units or infiltration structures can be installed that will ensure post- project runoff does not exceed pre-project levels for pollutants of concern. (Pollutants of concern are those on the USEPA's 303(d) list for South San Francisco Bay and its tributaries.)

- Reduce storm water pollution to the maximum extent practicable for projects that create over one acre or more of new impervious surface.
- Ensure post-project storm water runoff rates do not exceed the estimated pre-project runoff rates or durations so as to result in increased erosion or other adverse impacts to beneficial uses of a waterbody, which could be linked to changes in the amount and timing of runoff.

15-38

18) The westerly portion of the site is drained to detention ponds and Stevens Creek. Runoff from the easterly sections is directed to the Northern Channel that runs northerly of and along side of the Lockheed Channel. Flow is transferred to the Lockheed Channel through a 48-inch pipe connection. Drainage is then pumped by the Lockheed storm drainage pumping station into the West Outfall (a SCVWD facility). There is an agreement between Moffett and Lockheed covering the availability of Lockheed pumping facilities to handle Moffett area runoff. Currently 23 cubic feet per second (cfs) of the total plant capacity of 69 cfs is allocated to the Moffett facility. This agreement may need to be modified if increased runoff or greater pumping rates are anticipated.

15-39

19) The EIS indicates that a settling basin will be installed to the west of Building 119, the storm drain lift station. However, the EIS does not provide any information as to the sizing of the basin to handle storm water flows, the operational plan to ensure adequate detention time to allow for settlement of sediment-adhered pollutants, or any specifics as to how storm water quality would be improved before its discharge into the Northern Channel. Such information would be very useful in assessing whether or not the EIS will adequately address the City's concerns regarding storm water control and treatment issues.

15-40

20) The EIS does not provide adequate detail in the *Impact Discussion* to address the potential storm water quality issues and the minimization of impacts to receiving waters. One bulleted item states that "Additional criteria would include the adoption of performance standards, Best Management Practices, and Standard Operating Procedures to minimize runoff, sediment and other contaminants into the storm drain system, potentially reducing off-site flows." However, no examples or further information is provided as to what those "additional criteria" might be.

15-41

The City in concerned that there may be some significant impacts to storm water discharges resulting from this proposed development that may affect adjacent water bodies. Potential mitigation measures to meet the requirements of the "C.3 provision" in the City's NPDES Storm water Discharge Permit should be addressed in the EIS.

15-42

21) Wetlands

Impact BIO-2 states that there could be indirect adverse impacts to wetlands communities and water quality from construction sites for alternatives 2 and 4 (page 4.9-15). What impacts might these activities also have on the current storm drainage system as well as the ponds currently used for storm drainage discharge? The mitigation measures should consider the wide variety of Best Management Practices (BMPs) available to help reduce or eliminate impacts of construction to the storm drainage system or wetlands near construction areas. We suggest a reference to the BMPs for construction activities required in both the City of Mountain View and City of Sunnyvale Urban Runoff Management Plans be included in the

15-43

15-44

EIS. Also, BMPs for sediment/runoff control should be implemented at all construction sites not just those adjacent to wetland areas. 15-44

22) Impact BIO-2 (page 4.9 -17) discusses the potential impacts of increased storm water runoff into sensitive wetlands habitats in the Bay View area. Mitigation measure BIO -2a indicates that potentially contaminated runoff will be managed "*using storm water Best Management Practices.*" This statement is vague, considering the myriad of possible BMPs available. Some of the BMPs available are not related to construction controls, but rather to behaviors or practices of the agencies responsible for the area. Some BMPs are much more effective than others at controlling storm water impacts. Further discussion or examples of the BMPs that could be considered for this area would be helpful and would allow one to determine if the BMPs might actually control or significantly reduce the impact of storm water runoff on these sensitive habitats. 15-45

Public Works- Solid Waste Division

23) The document is significantly deficient in its discussion of solid waste. It takes the approach that the disposal in a landfill (any landfill, regardless of its location/haul distance or site integrity) of the waste generated by the project means that there are no environmental impacts due to increased solid waste generation. This approach is not acceptable nor does it comply with the law. On page 3.1-37, the statement is made that "The solid waste management section [of the City of Sunnyvale Environmental Management Element] is not relevant to Ames Research Center." The portion of the base that is within our city limits includes a closed landfill, making our Solid Waste Sub-Element quite relevant. The EIS makes no attempt to look into what is relevant. 15-46 15-47

24) California cities and counties are under a state mandate to reduce the volume of solid waste disposed by 50% (i.e. to divert 50% of the generated waste from disposal). Assuming that no annexations occur, the waste disposed would be "credited" to the County of Santa Clara. The additional waste generated by the preferred alternative is projected to be 6,629 tons per year. Doing some "back of the envelope calculations" with the preliminary figures for 2000 shown by the California Integrated Waste Management Board on its web site at http://www.ciwmb.ca.gov/LGTools/MARS/DRMCMain.asp, it appears that the project would increase the disposed total for the County Unincorporated Area by around 9%. Based on the preliminary numbers for 2000, this 6,629 tons, by itself, would reduce the County Unincorporated Area's diversion achievement by 2%. NASA has an obligation to divert 50% or more of its waste from disposal. 15-48

The EIS needs to consider and respond to the contents of the Santa Clara County Integrated Waste Management Plan and the Source Reduction and Recycling Elements for the County Unincorporated Area and the cities of Mountain View and Sunnyvale. It also needs to consider the goals, policies, and action statements of the Sunnyvale Solid Waste Sub-Element. Margaret Rands, Solid Waste Program Manager for Santa Clara County can be contacted at (408) 441-1198 x4401. 15-49

25) The Draft EIS' description and background information related to the old landfills on the base are inadequate. The EIS provides very little information on the sites. There are a number of relevant technical issues that were not brought up in the EIS (e.g. the pump station near 15-50

the golf course, which prevents water from rising to levels at which it would contact the refuse in the landfill). 15-50

26) The EIS also alleges that the largest landfill, located north of the runways, was closed in accordance with state regulations. We do not believe this to be the case. The Navy must apply to its landfills the same closure standard that Sunnyvale and Mountain View must meet has been our main complaint for years. If the EIS is to take the position that the landfill is closed in a way that meets State standards, it must cite some evidence. Also, the statement that "leachate and landfill gas trenches were dug" an inadequate description of the status of those structures and how they are being operated. 15-51

Public Works Traffic Engineering

27) All development proposed for the NASA Ames Research Center must be bicycle friendly, and encourage the use of bicycles as a form of transportation. 15-52

28) All developers should be required to retain the services of a traffic-engineering firm with specific expertise and experience in designing accommodations for bicycles per the AASHTO and Caltrans design Manuals. 15-53

29) The NADP should establish a policy to coordinate with the bicycle and pedestrian advisory committees of the surrounding communities, specifically the Mountain View and Sunnyvale Committees, as well as the Santa Clara Valley Transportation Authority (VTA) Bicycle and Pedestrian Advisory Committee. An NADP internal bicycle and pedestrian advisory committee should be formed to provide a forum for communication and issue resolution. 15-54

30) The NADP should adopt the *VTA Bicycle Technical Guidelines for* use for all new development within the Research Park. This document incorporates best design practices in order to provide safe accommodation for bicyclists in new development, and will ensure consistency in the design and construction of bicycle facilities. 15-55

LETTER 15

Frederik M. Fowler, Mayor, City of Sunnyvale, January 17, 2002.

15-1: This is an introductory comment that summarizes the project areas about which the City of Sunnyvale is particularly concerned. No response is required.

15-2: This comment states that the City of Sunnyvale opposes Alternatives 2 through 4. No response is required.

15-3: This comment states that the City of Sunnyvale finds only Alternative 5 to be acceptable. However, it is the City's opinion that the EIS did not account for all cumulative impacts. This opinion is described in further detail in Comment 15-4. The response to Comment 15-4 provides more detail.

15-4: As stated on page 2-72 of the EIS, the cumulative analysis is based on a list of projects currently proposed in the cities of Sunnyvale and Mountain View. These projects are listed in Table 2-16. An EIS is required only to include entitled projects in its cumulative impacts analysis: speculative projects are not required to be included. As explained on page 2-73 of the EIS, no projects other than those listed in Table 2-16 are currently proposed in the Lockheed or Moffett Park Specific Plan (MPSP) study areas, so the remainders of the building areas allowed by the Lockheed Master Use Permit and MPSP are not included in the cumulative analysis.

The possible adoption of the MPSP does not ensure that the level of development foreseen under it would occur. Thus, it would be speculative of the EIS to assume that all development foreseen in the MPSP would occur. Instead of assuming full buildout of either the MPSP or any other General Plan, the EIS assumes that all currently pending projects will be built. The analysis also includes a background growth rate of 2 percent per year for the years through 2003 and 1

percent per year for each subsequent year over the course of the assessment period, which would include any projects that might occur in later years under the MPSP.

15-5: Please see the response to Comment 10-1.

15-6: Please see the response to Comment 14-27.

15-7: Section 4.5 of this Final EIS has been modified to include additional cumulative analysis of impacts to the Sunnyvale Water Pollution Control Plant. Impact and Mitigation Measure INFRA-1 have also been modified to reflect this new analysis.

15-8: Please see response to Comment 15-4.

15-9: Consistency of the proposed project with Sunnyvale's General Plan, Land Use and Transportation Element (LUTE) is discussed in Appendix A of the EIS. This EIS does not assume construction of the capital improvements shown in the LUTE since they are generally unfunded. However, needed traffic mitigation measures are identified in Section 4.3 of this EIS.

15-10: Please see the response to Comment 10-1.

15-11: This comment reiterates several findings of the EIS and no response is needed. NASA has started working on a phasing plan for the implementation of various aspects of the project. The major milestones of this phasing plan are described in Section D of Chapter 2 of this EIS.

15-12: The specific projects currently proposed under both the Lockheed Master Use Permit and the Moffett Park Specific Plan are covered in the cumulative analysis in the EIS. Please see the response to

Comment 15-4 for more information on the treatment of these projects in this EIS.

15-13: NASA plans to continue to own the Eastside/Airfield portion of Moffett Field so it would be out of the scope of the EIS to evaluate the City of Sunnyvale's future development of this site.

15-14: As discussed in Section 4.5 and the response to Comment 15-7, NASA is willing to work with the City of Sunnyvale to determine the impacts of the NADP on the City sewer system. Sewer models and flow studies undertaken by the City in preparation of a regional sewer master plan would be extremely helpful in this regard. NASA looks forward to reviewing this work and discussing the ramifications of the results with the City.

15-15: The existing NASA pump station located in the northeastern portion of the Eastside/Airfield has adequate capacity to serve the development proposed under the NADP. However, examination of the pump station has revealed that it is likely that it would need to be replaced at some point during NADP buildout due to wear on the pump. For the initial phases of development, it is likely that it would be necessary to replace equipment and upgrade the existing facility. The cost of the upgrade has been included in preliminary estimates of the infrastructure required to support the development proposed under the NADP.

15-16: Section 4.5 of this EIS has been revised to better address sewer line capacity. See also the revised Mitigation Measure INFRA-1.

15-17: NASA does not plan to construct housing off-site. The purpose of the housing in the NADP is reduce the number of trips coming from offsite, as well as to provide convenient housing for the new employees and students who are a part of the Ames Research Center. NASA is continuing to work with the military to increase the housing

available to its partners on the Army's adjacent property. Please also see the response to Comment 14-27.

15-18: NASA acknowledges that the NADP would generate employees at a variety of income levels and has analyzed housing needs by occupation (including service industry workers) and income category as part of its preliminary analysis of demand for housing at NRP, which is contained in Chapter 5 of this Final EIS. NASA anticipates that one or more of its partners would conduct more detailed analysis of housing needs as part of NADP implementation.

With respect to the impact of the NADP development on existing housing, NASA believes that its analysis is adequate and reasonable. The demand for housing by NRP employee households that is not accommodated on-site is distributed over the Housing Impact Area. The Housing Impact Area is described on Table 3.14-9 of the DPEIS, and it contains 11 MTC Super Districts containing a wide variety of housing affordable to a broad range of income categories. NASA's analysis of housing impacts implicitly assumes that negative impacts on regional housing supply would be distributed evenly among all categories of housing in the Housing Impact Zone.

To partially mitigate its unavoidable significant impact on regional housing supply and the jobs/housing balance, NASA has modified the NADP to include 1,930 housing units as part of the Mitigated Alternative 5 (Preferred Alternative). This is an increase of 890 units in total. As part of the implementation of the NADP, NASA would work with its partners to ensure that housing developed at NRP is affordable to as broad a range of households as is feasible. At least 10 percent of the units would be affordable.

15-19: The commentor is correct in stating that Alternative 5 would generate approximately 7,222 new jobs requiring a minimum of 3,930 new housing units. The commentor is also correct in stating that because

Alternative 5 proposes 1,040 housing units, the development would exacerbate the present regional jobs/housing imbalance. This is considered a significant, unavoidable impact of the proposed project under Alternative 5. As described in response to Comment 14-27, NASA has revised the DPEIS to include plans to construct 890 additional units of housing as additional mitigation to address the jobs/housing imbalance, but the impact would remain significant and unavoidable.

15-20: NASA can not build housing off site. NASA is not authorized to directly build and operate housing. Under the NADP, NASA would have its university partners construct and manage the housing similar to the way they would handle housing for their other campuses. Partners may choose to build additional housing off-site, but this would be outside the scope of the NADP.

NASA expects most of the housing to be used by on-site students, faculty members and service workers who would support the development. The intent is to provide housing for these users of the research park. NASA considers the availability of this housing essential for the success of the project.

15-21: There is no reason to assume that the construction of a disaster training facility in the Eastside/Airfield area would conflict with the use or expansion of the golf course. The disaster training facility would be located about 100 meters (about 300 feet) from the nearest part of the golf course, and it would only engage in classwork and controlled, simulated disasters that would not pose any threat to persons outside of the facility's own grounds. More importantly, the disaster training facility is not included in the Preferred Alternative, Mitigated Alternative 5, so it is not included in the project currently anticipated by NASA.

15-22: This comment reiterates Impact REC-1 and Mitigation Measure REC-1, as presented in Table 0-1 and Section 4.12 of this EIS. No response is required.

15-23: The first part of this comment reiterates Impact REC-2 and Mitigation Measure REC-2. The second half of the comment adds that this mitigation measure would have an impact on the playability of the golf course and preclude potential expansion of the golf course. The playability of the golf course is not a NEPA issue. Furthermore, since the impact and mitigation measure apply only to Alternatives 2 and 4, and neither is the Preferred Alternative, it is not included in the project currently anticipated by NASA.

15-24: Under the NADP, the ordnance storage area located in the middle of the golf course would remain the same size and in the same location as it is now. No significant impact would be expected due to the location of the disaster training facility immediately adjacent to the golf course. Local noise and air quality would not be impacted other than by that which is caused by the increase in automobile traffic the new facility would generate and as is shown in Alternatives 2 and 4. The other alternatives do not include plans for a disaster training facility.

15-25: The planning is not yet completed for the Bay Trail. Please see the response to Comment 14-28.

15-26: Traffic impacts to emergency services are typically identified when a project proposes to construct a roadway that does not adequately serve emergency response vehicles or obstructs or closes an existing or planned emergency route. Increased traffic delays that may affect response times are addressed through the identification of intersection impacts. For intersections affected by implementation of various project alternatives, mitigation measures have been identified to reduce or eliminate significant impacts. This process is consistent with other

transportation analyses in the City of Sunnyvale and the region. Thus, no additional analysis or mitigation measures are necessary.

15-27: This comment correctly states that the closest mutual aid fire station for NASA Ames is in the City of Mountain View. No response is required.

15-28: Law enforcement services for lands opened to public use under the NADP would be provided by Ames Research Center. The land would still be owned by the Federal Government. The NRP would remain under exclusive federal jurisdiction. Other areas within the ARC, such as the Bay View area, are lands in which the federal government has a proprietary interest. Although there is no requirement that the federal government provide law enforcement on these lands, NASA intends to do so. Law enforcement plans are described on page 4.6-2 of this Final EIS, while legislative jurisdiction and proprietary interests are described on page 3.14-25 of this Final EIS.

15-29: Ames Research Center's fire protection services are currently provided by the California Air National Guard (CANG). These services are part of the Santa Clara County Fire Mutual Aid Agreement. Thus, if a significant emergency occurred in Sunnyvale that required additional fire protection services, the ARC engines and trucks would be available to assist in the response. As it is mutually beneficial, the Mutual Aid Agreement therefore represents no net impact on the City of Sunnyvale fire protection services.

The mutual aid agreement does not include police resources as NASA is federal land which is not policed by local law enforcement agencies.

15-30: This comment reiterates that there would be no impact on the City of Sunnyvale water system. No response is required.

15-31: The use of reclaimed water and treated groundwater for irrigation and industrial uses has been integrated into the NADP project, as detailed in Section 4.5, subsection B, of this EIS. This use would help reduce the potential potable water demand to the point that it offsets most of the increase in the annual water demand associated with the Preferred Alternative. Peak water demand would actually decrease for most of the alternatives. NASA looks forward to working with the City to expand the use of reclaimed water at Ames Research Center.

15-32: As discussed in the revised INFRA-1, portions of the sanitary sewer conveyance system between Ames Research Center and the SWPCP are already flowing at or near maximum capacity. Under Alternatives 2 through 5, discharge from the development proposed under the NADP would contribute to the existing capacity problems. Mitigation Measure INFRA-1 has been revised to address this impact.

15-33: None of the cumulative projects outside the boundaries of Ames Research Center discharge to the existing pump station in question and therefore do not impact its capacity. As discussed in the response to Comment 15-15, upgrading of the pump station has been included in preliminary estimates of the infrastructure required to support the development proposed under the NADP and would not become a capital expense for the City. Replacing existing outdated equipment with modern facilities would not increase the City's maintenance costs.

15-34: Please see response to Comment 15-32.

15-35: Please see response to Comment 15-32.

15-36: As discussed in Section 4.5 of the EIS, NASA is willing to contribute its fair share toward construction of conveyance pipes between Ames Research Center and the SWPCP, provided that the cost of the improvements will be shared by all development, existing and

proposed, that discharges to the piping to be upgraded. Impact and Mitigation Measure INFRA-1 has been revised based on that assumption.

15-37: NASA does not have plans to treat wastewater on-site. As discussed in Section 4.5.B of this EIS, NASA is integrating the use of Sunnyvale's reclaimed water into the development proposed under the NADP.

15-38: In order to minimize run-off and pollutant discharges associated with the project to Stevens Creek, NASA has revised the conceptual plan for the storm drain system, as described in Section 4.5 of this Final EIS, and would also implement the Best Management Practices described on page 2-31 of this Final EIS.

15-39: As noted on page 4.5-32 of this Final EIS, the storm drain discharge leaving Ames Research Center via the Northern Channel would not increase due to the development proposed under the NADP.

15-40: The settling basin would be designed in accordance with standard engineering practices to reduce pollutant loading in the existing storm drain discharge. During design of the facility, issues such as detention time would be addressed. As noted on page 4.5-30 of this Final EIS, none of the development proposed under the NADP would increase storm drain discharge into the Northern Channel. Therefore, although precise information regarding the operation of the settling basin cannot be provided at this time, it would improve the quality of the existing storm water discharge.

15-41: As discussed in the response to Comment 15-38, NASA has revised the conceptual plan for the storm drain system to reduce off site flows and pollutant loading. The structural elements of the backbone infrastructure system designed to achieve these goals are described on page 4.5-27 and -28 as revised in this Final EIS. In addition, page 2-31

as revised in this Final EIS lists Best Management Practices (BMPs) that NASA would incorporate into the Design Guidelines for the development proposed under the NADP. These BMPs would reduce pollutant loading in the stormwater runoff.

15-42: The structural elements of the backbone storm drain system designed to reduce off site flows and pollutant loading are described on page 4.5-27 and -28 as revised in this Final EIS.

15-43: Impact BIO-2 has been amended in this Final EIS to state that there could be adverse impacts if runoff from construction sites enters the existing storm drain system and the Storm Water Retention Pond.

15-44: As is standard practice in the industry, a Storm Water Pollution Prevention Plan (SWPPP) would be required to ensure that all construction activity would conform to the requirements of the Regional Water Quality Control Board. The SWPPPs would incorporate BMPs drawn from both adjacent cities, as well as other sources, based on the requirements of the particular project. BMPs to be implemented are listed on page 2-31 of this Final EIS.

15-45: The structural elements of the backbone storm drain system designed to reduce off-site pollutant loading are described in Section 4.5 as revised in this Final EIS. Additional BMPs that NASA would incorporate into the Design Guidelines for the development proposed under the NADP to reduce pollutant loading in the stormwater runoff are listed on page 2-31 of this Final EIS.

15-46: The threshold of significance with respect to solid waste in Section 4.6 state that the NADP would have a significant impact if it would create a demand for solid waste disposal that exceeds the capacity of the landfill site currently used for Ames Research Center's waste products (i.e. Newby Island Landfill). Any development would generate waste. However, because the proposed NADP would become part of

existing and future waste diversion programs at ARC, which currently divert more than 50 percent of ARC's solid waste, the impact of the development would not exceed the established threshold of significance. NASA expects that efforts to divert solid waste would continue to expand over the course of NADP build out.

15-47: The solid waste management section of the City of Sunnyvale Environmental Management Element contains action items primarily that relate to city waste collection service and reduction programs. NASA Ames Research Center does not receive city waste collection or recycling service. NASA determines and manages its own internal programs. The closed landfill within the city limits of Sunnyvale is outside the scope of the proposed project.

15-48: Santa Clara County's goal is to reduce the amount of waste it sends to landfills by 50 percent. The County currently diverts over 44 percent of its waste from landfills. ARC's recycling programs achieved a 63 percent diversion rate in 2001. This is above the state-mandated diversion rate of 50 percent for cities and counties. NASA would expand its waste diversion programs to the developed areas should Alternative 5 or Mitigated Alternative 5 be implemented. NASA has a strong commitment to waste diversion as demonstrated by its development of programs to divert a wide variety of materials from landfill.

If NASA maintains its 63 percent diversion rate over the course of the NADP's build out, which it expects to meet or exceed, then the amount of solid waste going to landfill would be 2,225 tonnes (2,453) tons per year. Therefore, the increase to the disposed total for the County Incorporated Area would be less than the 9 percent stated by the commentor.

15-49: NASA's waste diversion program is currently effective, but NASA will review other plans as required.

Regarding the Sunnyvale Solid Waste Sub-element, please see the response to Comment 15-47 above.

15-50: The NADP does not propose any changes to land use at the landfill site, and therefore further discussion is not within the scope of the project. For further information on the landfill, please contact Lawrence Lansdale, Acting BRAC Environmental Coordinator-Moffett Field/NTC Southwest Division, Naval Facilities Engineering Command, at (619) 532-0961.

15-51: The wording of page 3.7-7 of the EIS has been changed to reflect the fact that the landfill was closed in accordance with CERCLA requirements.

15-52: NASA has designed the NRP to be pedestrian and bicycle-friendly. All the new roads would include Class II Bicycle lanes. In addition, the NRP Design Guide is structured so that buildings would be easily accessible by pedestrians and so that adequate bicycle parking would be available. The proposed TDM Program would require that partners include amenities for bicyclists, such as enclosed bicycle parking and showering facilities.

15-53: Please see the response to Comment 13-2.

15-54: See response to Comment 13-3.

15-55: The NRP Transportation Demand Management (TDM) Program (described in Appendix B of the Draft EIS) outlines guideline options for bicycle accommodation. These standards are based directly on the *Bicycle Technical Guidelines: A Guide for Local Agencies in Santa Clara County*, published by the VTA.

The VTA Bicycle Technical Guidelines were consulted in developing the Design Guidelines and the draft TDM Program. The VTA

guidelines were used as minimum standards in terms of the amount of bicycle parking to provide and the location of bicycle parking. The TDM Program and site Design Guidelines plan for long-term bicycle parking in the form of bicycle "houses" or bicycle cages, such as those located at Stanford University's Sand Hill Road graduate student housing. The bicycle houses are intended to provide a more durable, desirable, and attractive parking option for long-term bicycle parking than do traditional bicycle lockers. The bicycle houses provide both full enclosure of the bike as well as coverage from the elements. The houses would be accessed by key-card and bikes could also be individually locked within the structures.

SAN JOSE
INTERNATIONAL
AIRPORT

Via Certified Mail

January 22, 2002

Ms Sandy Olliges
Environmental Services Office
NASA Ames Research Center
Mail Stop 218-1
Moffett Field, CA 94035-1000

Subject: Draft EIS for NASA Ames Development Plan

Dear Ms. Olliges:

The City of San Jose has reviewed the Draft Environmental Impact Statement (DEIS) on the proposed NASA Ames Development Plan at Moffett Federal Airfield.

- **The City is very disappointed and concerned that its EIS scoping comments (dated July 17, 2000, and submitted to NASA via certified mail) were completely ignored in the preparation of the DEIS.**

I6-1

- **Moreover, these omissions and other deficiencies in the Draft EIS, as specified below, raise a concern that an undisclosed objective of the NASA Ames Development Plan is to constrain, or possibly foreclose, future growth in aviation activity; if so, then the EIS borders on segmentation of a larger project in violation of NEPA requirements.**

I6-2

Specific Comments

1. The text and exhibits throughout the DEIS identify the project site as the "Ames Research Center" rather than the official designations previously used by NASA and the public, i.e., "Moffett Field" or "Moffett Federal Airfield". The Comprehensive Use Plan which, according to the DEIS, currently serves as NASA's planning guide for the project site, is officially titled the "Moffett Field Comprehensive Use Plan"; further, as recent as 1996, NASA published a Draft Environmental Assessment for a project entitled "CRAF Air Cargo Operations at Moffett Federal Airfield". The unexplained change in identification of the project site, intentional or unintentional, misleads the public by implying that the airfield is an inconsequential component of the project site.

I6-3

1732 N. First Street, Suite 600 • San Jose, CA 95112-4538 • Tel: 408.501.7600 • Fax: 408.573.1675 • www.sjc.org

2. The "Project Purpose and Need" section of the DEIS (Page 1-20), which is critical to an understanding of the proposed project, its reasonable alternatives, and their associated environmental impacts, is woefully insufficient. **16-4**

   a. The DEIS vaguely states that the primary purpose of the proposed project is to further NASA's "mission", without providing any definition or description of that mission. It is not clear how a development plan involving a wide spectrum of new industrial, commercial, educational, museum, and residential land uses, implemented by an assortment of public/private/institutional/nonprofit users, relates to the functions of the National Aeronautics and Space Administration. **16-5**

   b. The DEIS also vaguely states that a secondary purpose of the project is to "enhance ARC's research capabilities and enable more efficient use of its land". There is no discussion of how NASA's activities would be enhanced; moreover, a project objective of achieving a more efficient use of land would reasonably lead to a number of potential development alternatives that are substantially different from those analyzed in the EIS. **16-6**

   c. The DEIS contains no discussion or description of "Project Need", an indication that the project is too conceptual and ill-defined to allow appropriate environmental analysis. An EIS should contain a clear statement of Purpose and Need for each component of the proposed project. (By comparison, the Federal Aviation Administration's 1999 EIS for the San Jose International Airport Master Plan, a similarly-sized site combining both airfield and landside development, is 22 pages in length.) **16-7**

   d. As the airfield is the largest physical component of the project site, the Purpose and Need section should explicitly address the extent to which the project is intended to support, maintain, or constrain the viability and safety of airfield operations. **16-8**

3. The scoping and description of Alternatives (Chapter 2) is deficient on several levels, including failure to identify a range of reasonable alternatives. **16-9**

   a. With the exception of Alternative 1 (No Project), all the alternatives presented are very similar, differing only in density and location of certain land uses. There is no explanation as to why Alternative 5 is designated the "Preferred Alternative" or how any of the alternatives serve the Project Purpose and Need. **16-10**

b. The EIS contains no discussion of other alternatives that might have been, or could be, considered. An alternative that proposes expansion of aviation activity, consistent with regional interests (such as the air cargo proposal previously considered by NASA in 1996), could conceivably provide long term stability and uses compatible with the on-site activities and facilities of NASA and other tenants. **16-11**

c. Alternatives 2-5 all specifically propose the relocation of the existing airfield control tower from the west side of the airfield to the east side. The DEIS provides no information on why this particular element is proposed and the technical analysis that was conducted to select a new location. Siting a control tower typically requires an extensive analysis (including alternatives) to ensure that a clear and unobstructed view of the airfield and aircraft approach/departure corridor is achieved. **16-12**

4. The Public Policy sections of the Affected Environment and Environmental Consequences chapters exclude mention of at least three local or regional agencies with significant interest in future land use at Moffett Federal Airfield. As stated in San Jose's EIS scoping comments, the EIS should identify and assess the proposed project's consistency with the adopted plans and policies of:

a. The City of San Jose, located within one mile of the project site and the largest city in Northern California. City Council Resolution No. 66096, adopted on June 27, 1995 (copy previously provided), recognizes and supports the continued economic viability of Moffett under NASA operation, with potential civil aviation use if and when consistent with NASA's operational requirements. **16-13**

b. The Bay Conservation and Development Commission (BCDC), a State-created regional agency with direct jurisdiction over land uses adjacent to San Francisco Bay. BCDC's adopted Bay Plan designates Moffett as an "Airport Priority Use Area" and supports consideration of commercial aviation when restricted military use is no longer needed.

c. The Metropolitan Transportation Commission (MTC), the federally-designated metropolitan planning organization for the nine-county San Francisco Bay area. MTC's adopted Regional Airport System Plan, updated in 2000, retains a regional interest in potential civil aviation use of Moffett.

5. As requested in the City's scoping comments, the Land Use analysis section of the EIS should describe how the project alternatives would directly or indirectly impact physical or operational use of the airfield, including runways, taxiways, aircraft movement/parking aprons, navigational aids, and federal obstacle clearance/imaginary surface standards. Given the magnitude of the proposed development immediately adjacent to the airfield, the DEIS is deficient in not addressing impacts on current and projected aviation activity. **16-14**

6. The Land Use or Cumulative Impact section of the EIS should address the impact of the proposed development on the inventory of existing and developable land designated for similar types of development (e.g., light industrial, office commercial, institutional, and residential) in the General Plans of area cities. The proposed project could attract development onto federal (non-taxable) property that otherwise might locate within area cities. **16-15**

7. The Noise analysis section of the DEIS states that aircraft fleet mix and operations demand projections from the 1994 Comprehensive Use Plan do not need to be updated. This assumption needs to be reconsidered or justified given the new development proposed by the project. In turn, the EIS should reassess the potential incompatibility of the proposed residential development in the Bay View area (close to the departure end of the runways) particularly if future airfield use generates a larger 65 dB Ldn impact area. **16-16**

A copy of the Final EIS should be sent to the **City of San Jose Airport Department, Attn: Cary Greene, Airport Planner, 1732 N. First Street, Suite 600, San Jose, CA 95112.** NASA and its environmental consultants are welcome to contact me at (408) 501-7670 or Mr. Greene of my staff at (408) 501-7702 to further discuss these comments.

Sincerely,

Ralph G. Tonseth
Director of Aviation

cc: Mayor and City Council
Airport Commission
Federal Aviation Administration, Airports District Office
U.S. Environmental Protection Agency, Region IX
Metropolitan Transportation Commission
Bay Conservation and Development Commission

LETTER 16

Ralph G. Tonseth, Director of Aviation, San Jose International Airport, January 22, 2002.

16-1: In preparing the Draft EIS, NASA made its best effort to include information to address all scoping comments, including those from San Jose International Airport dated July 17, 2000. The purpose of the public review of the Draft EIS is to ensure a complete analysis, so any shortfalls in addressing scoping comments can be corrected in the Final EIS. NASA is addressing the airport's perceived shortfalls in the responses below and the indicated changes to the EIS.

16-2: Please see the response to Comment 4-8.

16-3: The NADP and its EIS refer to the entire site as NASA Ames Research Center because NASA is the federal agency who has custody of the site for the U.S. Government. The airfield remains an important and integral part of the ARC, and is included in the Eastside/Airfield planning area.

16-4: This comment states that the Project Purpose and Need description in the EIS is insufficient. This is an introductory comment to issues described in more detail in Comments 16-5 through 16-8. Therefore, no response is provided here. Please refer to responses to Comments 16-5 through 16-8 below.

16-5: NASA's overall mission is defined by the National Aeronautics and Space Act of 1958, which is described on page 3.1-2. Additional information on NASA's mission has also been added on page 1-20 of this Final EIS. This mission includes undertaking aeronautical and space activities for the nation's welfare and security, expanding knowledge of the Earth and of phenomena in the atmosphere and space, using the engineering and research resources of the United States effectively and developing ground propulsion, advanced aviation

propulsion and bioengineering research, development and demonstration projects.

The purpose of the project is spelled out on pages 1-20 through 1-22 of the EIS. As noted on those pages, development under the NADP would aid NASA in achieving the mission summarized above "by providing the vital scientific, engineering and academic community necessary to create crucial research focused on the advancement of human knowledge about space, the Earth and society" and by "keep[ing] ARC's researchers involved in cutting-edge technology advances in Silicon Valley, the San Francisco Bay and beyond."

The project includes not only research facilities, but also additional facilities needed to support the research facilities, including recreation facilities, services and housing for workers. Given the Bay Area's tight housing market and traffic congestion, it is necessary to provide these amenities for workers on-site to alleviate the regional jobs/housing imbalance and traffic congestion in the area.

16-6: Pages 1-20 through 1-22 of the EIS clearly indicate how the project would enhance NASA research capabilities by creating better partnerships with industry and academic institutions. The NADP will extend and deepen the research and development capabilities of Ames through research and development partnerships in key research areas. NADP partners must conduct activities that support these key areas which include information sciences, nanotechnology, biotechnology and astrobiology. Collaborative partners will build new research and education facilities that support NADP goals at Ames. NASA will benefit by the close proximity of, and ready interaction with, researchers and students. NADP partners will provide a fair value for their presence, including reimbursement of costs to NASA. Partners will also generate an endowment to support research that is aligned with NASA's mission.

The project would result in more efficient use of the site by placing significantly larger concentrations of jobs and housing at ARC in buildings that are now functionally obsolete.

16-7: Pages 1-20 through 1-22 of the EIS have been expanded to include an additional explanation of the need for the project.

16-8: Please see the response to Comment 4-8. The airfield would continue to support NASA's mission. It would be maintained at its current level of use. It is not anticipated that the NADP will restrain airfield operations.

16-9: Under NEPA, there is no set number of alternatives that defines a "reasonable range of alternatives". What constitutes a reasonable range of alternatives depends on the nature of the proposal and the facts in each case. Section 1501.14(d) of NEPA requires the EIS to include a "No-Action Alternative", which in the EIS for the NADP was renamed the "No Project Alternative". A lead agency should also consider any reasonable action that could fulfill the purpose and need of the proposed action. Reasonable alternatives are those that may be feasibly implemented based on technical, economic, environmental and other factors. A lead agency is not required to evaluate alternatives beyond the reasonable range.

16-10: The range of alternatives presented in the EIS meets the requirements of NEPA. Mitigated Alternative 5 is designated as the Preferred Alternative because it meets the purpose and needs of the project with fewer overall significant environmental impacts than the other alternatives. While Alternative 3 has fewer impacts on open space, Alternative 5, with or without mitigation measure SOCIO-1b, has fewer impacts overall and is the most balanced of all alternatives in terms of meeting the needs of different interests (e.g. environmental, housing).

16-11: Expansion of airfield activities does not support the NADP purpose and need.

16-12: The siting of the control tower has not been finalized. The proposed location of the existing airfield control tower is a conceptual solution, and does not resolve the required visual and physical requirements. NASA understands that additional analysis would need to be provided to the FAA before the exact location and tower height is determined. To date, this has not been performed. NASA would make a complete submission prior to any tower relocation plan. It will be important to consider all the specialized design aspects for an air traffic control tower such as line of sight, air traffic patterns, and types of aircraft served.

16-13: A description of relevant plans of the City of San Jose, the Bay Conservation and Development Commission and the Metropolitan Transportation Commission has been added to Section 3.1 of this Final EIS. An analysis of the alternatives' consistency with these plans has been added to Appendix A.

16-14: An analysis of compatibility with the physical and operational use of the airfield has been added to Section 4.2, subsection B.3, of this Final EIS.

16-15: Evaluation of the proposed NADP's impact on land uses in surrounding areas is addressed in Section 4.2 of the EIS. Further analysis of the impacts of NADP development on the business operations of private property owners would be speculative and is not required under NEPA.

16-16: The EIS uses noise exposure measurements for aircraft operations in the baseline year of 1999 that were provided by Michael R. Mc Clintock & Company on August 28, 2000. Figure 3.10-7 indicates the

baseline noise exposure from the airfield. Since no change in the airfield is proposed, no change in noise contours is expected.

WATER TRANSIT AUTHORITY

WTA

TO: National Aeronautics and Space Administration
(650) 604-0680

FROM: Water Transit Authority, Thomas G. Bertken, CEO

SUBJECT: Comments of the DEIS for the proposed NASA Ames Development Plan (NADP)

DATE: January 28th, 2002

The Water Transit Authority has reviewed the NASA Ames Development Plan (NADP), with a particular focus to analyze the opportunities for a water transit terminal. By way of background, the Water Transit Authority was created in 1999, a regional agency governed by an appointed Board of Directors and staffed by a small group of transportation professionals and clerical staff. The WTA Board of Directors is to prepare and adopt a San Francisco Bay Area water transit Implementation and Operations Plan, in order to provide adequate information for the Legislature to assess the costs and benefits of ferry service expansion, and to compare the environmental and economic effectiveness of ferry service investment with other potential transportation investments. The tasks are as follows:

- Prepare a detailed description of routes and terminals to be developed within a ten-year period.
- Update the ridership demand model and prepare a demand analysis of each travel corridor.
- Design intermodal connection between the ferry service and other modes of transportation.
- Develop vessel design specifications.
- Design a safety plan with the U.S. Coast Guard and the California Maritime Academy.
- Conduct public outreach and hearings.
- Site ferry terminal locations around the Bay Area.
- Initiate and complete a systemwide programmatic environmental document.
- Project capital and funding requirements.
- Develop a funding and financing plan.

I7-1

Before the creation of the WTA, Nasa Ames officially participated in the Bay Area Blue Ribbon Task Force, a group organized by the Bay Area Council and the Bay Area Economic Forum to explore the feasibility of the creation of an expanded water transit system. At that time, from 1997 through 2000, NASA Ames was on record as having within its boundaries the only viable location for a Southern water transit location. WTA is including the NASA Ames location in our alternatives because it was only a short time ago that this was desired on your behalf.

The alternatives discussed in Section 2 of the Environmental Document do not include the development of a ferry terminal. In addition, Sections 3.3 and 4.3 of the Environmental Document relating to traffic circulation do not include the development of a ferry service as a potential mitigation, nor does it discuss implications of including ferry service to the site. I7-2

WTA is in the midst of planning for future ferry terminals and routes. We are not doing site-specific evaluations and are primarily assessing cumulative impacts of ferry expansions as well as identifying the potential economic viability of expanded ferry service. Ferry service to Moffett Field is being included in several of the alternatives we are studying. I7-3

We would like to see that your EIR recognize the planning work we are doing.

Thank you for this opportunity to comment.

LETTER 17

Thomas G. Bertken, CEO, Water Transit Authority, January 28, 2002.

17-1: This comment provides background about the Water Transit Authority. It does not comment on the DPEIS; therefore, no response is required.

17-2: A future ferry terminal is not a part of any of the alternatives presented in the Final Programmatic EIS and is outside the scope of the NADP. Nothing in the NADP would preclude a future ferry terminal at ARC, but none is proposed as part of the project. Thus, it would not be appropriate to include a ferry terminal in the EIS.

17-3: This comment indicates that Moffett Field is included as a potential site for a ferry terminal as part of the Water Transit Authority's ferry terminal planning process. This work is recognized on page 2-74 of the EIS. No further analysis is required.

Regional Open Space

MIDPENINSULA REGIONAL OPEN SPACE DISTRICT

January 28, 2002

Ms. Sandy Olliges
NASA Ames Research Center
Mail Stop 218-1
Moffett Field, CA 94035-1000

RE: Draft Environmental Impact Statement (DEIS) for NASA Ames Development Plan (NADP)

Dear Ms. Olliges:

Thank you for providing the Midpeninsula Regional Open Space District (District) with an opportunity to review and comment on the DEIS for the NASA Ames Development Plan. The District is a public agency that was formed by the voters in 1972, pursuant to the State of California Public Resources Code section 5500 *et seq.*, to preserve, protect and enhance open space lands in Santa Clara County. Subsequently, parts of San Mateo and Santa Cruz Counties were also annexed and included within the District boundary. The District now manages over 47,000 acres in 27 preserves, including the Stevens Creek Shoreline Nature Study Area—a 54-acre neighboring preserve that lies at the north end of the project area. As an immediate neighbor of the NASA Ames Research Center lands, the District is keenly interested in any future development plans that pertain to them, particularly since they provide important public access to the bay, scenic value, and bayland habitat unique to the San Francisco Region. **18-1**

After reviewing NASA's environmental document, the District hereby submits the following questions and recommendations regarding the assessment and mitigation for impacts on aesthetics, biological resources, recreation, and hydrology. Two issues are of paramount importance and must be addressed at the onset. First, as a contiguous landowner to the project area, the District should have been actively consulted as the NADP was developed. This lack of a diligent effort to involve the District, as required by 40 Code of Federal Regulations 1506.6(a) and (b)(3)(vi), is documented on page I-2, where cooperating agency contacts are listed. This unexplained lack of contact with the District is of particular concern because of the second issue: the project's reliance on continued use of the District's Stevens Creek Shoreline Nature Study Area, formerly known as Crittenden Marsh, as a component of NASA's storm water system. Portions of the area known as the "Stormwater Retention Pond" (SWRP), including the preserve, are contaminated and are included within Moffett Field Superfund Site 25. This contamination was only recently brought to the attention of the District, and on August 31, 2001, 25, in response to District concerns, the Navy, the Environmental Protection Agency (EPA) and the Regional Water Quality Control Board (RWQCB) withdrew the proposal for the clean up and restoration of Site 25. In that context, the District has made clear its desire to restore Stevens Creek Shoreline Nature Study Area to historic, tidal functionality. Previously, the District provided NASA with a copy of Stevens Creek: A Plan of Opportunities (1980), a collaborative vision of the Santa Clara Valley Water District, the City of Mountain View, and the District for the future of this area. The District remains strongly committed to that restoration and enhancement of its preserve. **18-2** **18-3**

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The District anticipates that the Navy will re-examine and revise the cleanup plan for Site 25 in light of the District's intended use of its lands. In view of this considerable uncertainty over the future configuration and operation of the storm water system, the District is of the view that this document is inherently inadequate in its discussion of all issues relating to the SWRP. At a minimum, a realistic set of alternatives for storm water management under each of the build-out scenarios should be presented and should address the District's goal of the restoration of tidality to the preserve. The only indication of the possible loss-of-use to District lands is found in the discussion on page 13:

> "Alternatives 1 through 5 conflict with this plan because they all include a pumping station in the northwest corner of the SWRP, to pump stormwater to Stevens Creek when necessary to prevent flooding. This is an existing incompatible use. Implementation of Alternatives 2 through 5 would not cause any additional incompatibility. If the MROSD implements its plan to breach the existing eastern dike along Stevens Creek, and to construct a new eastside levee east of their refuge, then NASA would relocate its stormwater pump."

18-3

This is hardly adequate to address the complexities of the very real possibility of a material change in the use of the preserve. Currently, NASA has only a verbal license to operate its stormwater facilities, including the pumping system, within the Stevens Creek Shoreline Nature Study Area; there is no certainty that such use will be allowed to continue, irrespective of eventual restoration of tidal flow to the area.

Additional comments relative to this particular shortcoming of the DEIS are also presented in the Hydrology section of our comments following these preliminary observations.

Aesthetics

Based on the information provided in the DEIS, the visual character of the Bay View area would change dramatically under Alternatives 2, 4, and 5. At present, the Bay View area is almost entirely undeveloped, offering expansive views of the Ames Research Center from surrounding recreational lands, including the District's Stevens Creek Shoreline Nature Study and the northern portion of the Stevens Creek Trail corridor. Under Alternative 2, there would be approximately 121,000 square meters (1.3 million square feet) of new development concentrated on approximately 14 hectares (34 acres). Alternative 4 proposes a more extensive development of 250,830 square meters (2.7 million square feet) on approximately 28.03 hectares (68.83 acres) of land. Alternative 5 proposes 92,900 square meters (1.0 million square feet) of new development on approximately 9.28 hectares (22.92 acres) of land. Unfortunately, there are no current design guidelines, height restrictions, or setback requirements for the Bay View area. This lack of information impedes a thorough understanding of the potential impact on the existing aesthetic, visual, and ecological resources of the area. If and when such information becomes available, public review of a supplemental or subsequent EIS is needed to fully evaluate the potential visual impact on recreational users of the Stevens Creek Trail and the surrounding baylands.

18-4

The Stevens Creek Trail corridor, a linear strip of undeveloped, recreational land located immediately west of the Ames Research Center, could be adversely affected by the new development proposed in Alternative 2 if the buildings are two or more stories high. These

18-5

building could significantly block the existing open space views from the Stevens Creek Trail across the Ames Research Center, and as these views are one of the trail's main attractions, such an impact is of major concern to the District. This issue should also be addressed in a supplemental or subsequent EIS, once design and construction information is known, to better analyze the potential impact on the trail and to address adequate mitigation measures. **18-5**

Biological Resources

The DEIS proposes the designation of habitat preserves for burrowing owls within the Ames Research Park Area of Moffett Field. In the environmental document, NASA explains the importance of preserving land for the burrowing owls as a protective measure to reduce the potential biological impact on this species due to the proposed development at Moffett Field. Given the scarcity of suitable habitat for a species dependent on flat, grassland areas for its survival, habitat protection and preservation is of particular importance. Unfortunately, the preserve proposed for the Ames Research Park Area is currently laden with roadways, pathways, and other obstacles that prevent the site, as it currently exists, from providing optimal habitat. Thus, the roadways and other obstacles should be removed, and the area restored a more natural state in order to improve its habitat value, thereby minimizing to the greatest extent possible the potential negative impact on the burrowing owl. **18-6**

The District is also concerned about potential short-term impacts to resident burrowing owls due to temporary construction activities. In the DEIS, mitigation measure BIO-11a is included to address the potential short-term disturbances as follows:

> "Construction near owl habitat would be scheduled outside of breeding season, which typically runs from February 1 to August 31, ***as much as possible***."

Given that NASA Ames Research Center supports the largest sub-population of burrowing owls in the San Francisco Bay Area, construction near owl habitat should be scheduled *fully outside* the breeding season in order to minimize the potential impact on individual owls and on the owl population as a whole. The phrase, "as much as possible," does not guarantee that the impact on the burrowing owls would be significantly or sufficiently minimized. Therefore, to ensure adequate protection for the owls from the potential impacts of noise and ground vibration, not to mention the collapse of their burrows due to the use of heavy construction equipment, the District recommends deleting the phrase, "as much as possible," from the mitigation measure **18-7**

The District recommends incorporating the following mitigation measure to further minimize the potential impact on burrowing-owl habitat from long-term disturbances associated with the proposed development:

> Mitigation Measure BIO-11b: In order to prevent long-term disturbances from increases in population associated with implementation of the NADP, NASA would:
> — Restrict construction of roads, trails, pathways, and other development from occurring within the designated burrowing owl Preserves to retain a long-term sustainable burrowing owl habitat. **18-8**

In the Bay View Area, development alternatives 2, 4, and 5 include a belt of open space land to surround the proposed new facilities. According to DEIS maps, the open space buffer is **18-9**

expected to be approximately 50 feet wide. Just north of this location are large wetland areas known as the Eastern and Western Diked Marshes. These wetlands are of particular interest as sightings of the endangered salt marsh harvest mouse and California clapper rail, as well as the threatened western snowy plover, have been documented in the vicinity. The DEIS discusses the uncertainty of how much of an upland edge constitutes enough of a buffer zone to protect the salt marsh harvest mouse from the disturbance of humans and non-native predators such as cats, both domesticated and feral. However, according to the DEIS, USFWS Endangered Species biologists recommend a buffer of 100 feet. In light of this inconsistency between the DEIS and USFW, the District requests a more careful analysis of the appropriate size of the open space buffer zone. It would seem that the open and low-lying nature of the Bay View Area would require a much wider buffer zone than the proposed 50 feet. This is particularly true if future development nearby should include housing, a land use that would undoubtedly increase the level of human disturbance and the number of non-native predators. Moreover, a wider buffer zone would provide greater vegetation cover for native species, thus offering them more protection from non-native predators. Therefore, the District strongly urges NASA to widen the open space buffer to a minimum of 100 feet in accordance with the USFS recommendation.

18-9

Under Section 4.9, the DEIS states that "because construction vehicles are unlikely to need to drive on the roads surrounding the coastal salt marsh, the potential for take of salt marsh harvest mice . . .is considered extremely low." Although the likelihood for construction vehicles to drive near the salt marsh is considered low, adequate protection of the salt marsh harvest mouse is important. In order to protect the salt marsh harvest mouse from potential injury or death caused by vehicular traffic, construction vehicles should be prohibited from utilizing the roads surrounding the coastal salt marsh. Mitigation Measure BIO-1 should therefore be revised as follows:

18-10

> "Mitigation Measure BIO-1: To minimize the potential for injury or death caused by construction vehicles to western burrowing owls in all four planning areas, and to salt marsh harvest mice in the Bay View area, the following components would be implemented:
> — Construction traffic would be routed on roads farthest from areas where these special-status species occur ***and prohibited from using roads surrounding the coastal salt marsh***."

Recreation

According to the DEIS, Alternatives 2, 3, and 4 would not supply enough new recreational space to meet the demands generated by new employees and residents. To address this potential impact, the DEIS provides mitigation measure REC-1, which states that, "NASA and/or its partners would develop additional active recreation areas on- or off-site to meet recreation demands generated by new employees and residents." Unfortunately, this measure is too vague to explain how the project would meet future recreational demands. Mitigation Measure REC-1 should explain, in much greater detail, how and where new recreation areas would be developed. Furthermore, Mitigation Measure REC-1 should account for the fact that Highways 237 and 101 both function as barriers potentially preventing future workers and residents of Moffett Field from utilizing recreational areas located beyond these freeways unless a safe and convenient access connection is provided. Given this finding, it seems appropriate to include the Bay Trail extension through Moffett Field as a viable addition to existing recreational facilities.

18-11

18-12

This trail extension would provide a desirable connection between the northern segment of the Bay Trail through Mountain View Shoreline Park and the southern segment of the trail through the Sunnyvale Baylands Park. The Bay Trail extension through Moffett Field would not only provide increased recreational opportunities within ARC, but also provide links to recreational sites in neighboring cities. For these reasons, the District recommends including the following mitigation measure:

> Mitigation Measure REC-1A: To provide additional active recreation areas to meet recreation demands generated by new employees and residents, the following component would be implemented:
> — Collaborate with Bay Trail advocates to determine an appropriate location for the Bay Trail extension through Moffett Field lands and simultaneously construct and open the Bay Trail extension to public use with the scheduled start of construction in the Bay View area.

18-12

Hydrology

The DEIS states that in the past the Bay View Area and northern ARC have experienced general flooding due to a combination of inadequate storm drain system capacity and low ground elevations relative to the water level of the Storm Water Retention Pond (SWRP). The remainder of the western drainage area has also experienced localized flooding due to inadequate system capacity. According to the DEIS, several storm drain studies have been conducted over the past 20 years, and all of them agree that major renovation and rehabilitation of the western drainage system should take place. To help address the potential for future flooding, the DEIS notes that the site would be filled prior to construction to raise its elevation above the flooding level, thereby avoiding any potential flood impact. However, the DEIS does not describe what indirect impact, if any, would result from this mitigation measure, particularly on the existing storm water management system. Given that the planned development, particularly in the Bay View Area, will result in a significant loss of permeable surface, the DEIS also does not adequately address the extent of the potential impact of the proposed development on the storm drain system due to the increase in surface runoff.

18-13

The DEIS notes that the western drainage system discharges into the SWRP located north of the Bay View Area. The SWRP has no outfall, so during most of the year water is removed by evaporation only. During the wet season of some years, when flow into the SWRP exceeds the storage capacity, temporary pumps are moved onto the levee on the western edge of the SWRP where water is pumped directly into Stevens Creek. Midpeninsula Regional Open Space District owns the western portion of the SWRP, including the levee where the pumps are installed. By stating that the pumps installed on District property are "temporary", we assume that they will be put there "legally" and removed during low rainfall years. Please be aware that the installation or removal of any NASA facility or structure on or off District lands requires approval from our Board of Directors and a signed agreement between the District and NASA.

18-14

Under baseline conditions, new development located at the southern end of the NASA Research Park would create conflicts with the existing storm water collection system. The DEIS states that a new storm drain system would be constructed to accommodate the new site layout. The quantity of storm runoff would not increase significantly as a result of the baseline development. However, the existing storm drain that serves NASA Research Park cannot accommodate the

18-15

existing storm runoff. Therefore, a new system is proposed to divert storm water around the Ames Campus. With the new drainage system, the DEIS states that runoff from the NASA Research Park would be intercepted prior to entering Shenandoah Plaza by a 1070-mm (42-inch) main located in Wescoat Road and directed east toward the airfield. The interceptor is expected to extend east past the West Parallel in the airfield and then run north along the western edge of the airfield, eventually discharging into a new settling basin adjacent to the existing settling basin north of Ames Campus. The District is concerned that even with the proposed infrastructure improvements, the Bay View Area would receive high quantities of runoff that would exceed its current capacity. There is legitimate concern that increasing the amount of runoff discharging into the storm water detention basin would increase the potential for future flooding since the current capacity of the SWRP is already unable to hold the amount of runoff during periods of high rainfall. Increased flooding can then indirectly impact nearby sensitive habitats, including that of the burrowing owl. Additionally, since the SWRP is located partly on District land, NASA has no rights to increase the runoff onto the District preserve. **18-15**

Lastly, please note that the Executive Summary neglects to discuss the potential impacts of the project to storm water management services, which may be significant given past onsite flooding when heavy rains surpassed the allowable capacity of the current system. Development proposed for the Bay View Area would cover a significant amount of existing permeable surface at Moffett Field, increasing the amount of surface runoff and taxing the future capacity of the storm water system at ARC. **18-16**

We strongly recommend that the draft environmental document be withdrawn and revised to adequately address the issues discussed above. Please let us know if we can be of further assistance, and please be sure to involve the District as an active participant in any future discussions of the NASA Ames Research Center development plans. District costs and District interests are directly affected by this proposed plan. **18-17**

Sincerely,

L. Craig Britton,
General Manager
LCB: ar:ds

cc: MROSD Board of Directors

LETTER 18

L. Craig Britton, General Manager, Midpeninsula Regional Open Space District, January 28, 2002.

18-1: This is an introductory comment that provides background about the Midpeninsula Regional Open Space District (MROSD). No response is required.

18-2: The Notice of Intent to prepare an Environmental Impact Statement was published in the Federal Register on June 16, 2000. This intent was also published in local newspapers at the same time. Public meetings to receive scoping comments were held on July 10, 12, and 13, 2000. The Notice of Availability for the Draft Programmatic EIS (DPEIS) was published in the Federal Register by NASA on November 26, 2001, and by EPA on December 10, 2001. This marked the beginning of the public review period, which extended until January 28, 2002. This 50-day review and comment period was five days longer than the required 45-day period. During this period, five public meetings were held. Three of these meetings were held at Ames Research Center on December 3, 10 and 11, 2001. The other two were held at the City Council chambers of the City of Mountain View and the City of Sunnyvale on December 12 and 13, 2001 respectively. Individuals and groups who were on NASA's mailing list, or people or groups who requested copies, received the DPEIS by mail. The DPEIS was also available on the Internet. To accompany the DPEIS, NASA produced a Fact Sheet summarizing the findings of the DPEIS that was available by request and at all public meetings.

The MROSD was notified on June 22, 2000 of NASA's intent to prepare an EIS and was invited to submit written or oral scoping comments. NASA held public meetings to receive scoping comments on July 10, 12, and 13, 2000. At the July 12 meeting, oral comments were made by Betsy Crowder. Although she identified herself as being on the Board of Directors of the MROSD, she said that she was

speaking as a citizen. Her comments pertained to the Bay Trail and protection of the burrowing owl. Although Ms. Crowder spoke as a citizen, and not officially for the MROSD, NASA believes that the fact that written notice was provided to the MROSD and that one of its Board members spoke at the public meeting shows that the MROSD has been aware of NASA's plans since July of 2000, and has had ample time to submit comments.

A Notice of Availability of the DPEIS along with the Fact Sheet was mailed to MROSD on November 27, 2001, and a copy of the DPEIS was mailed to MROSD on November 27, 2001.

18-3: As described in Section 4.5 as revised in the Final EIS, the revised storm drain system would not increase the peak discharge into the Storm Water Retention Pond (SWRP). Currently, Ames Research Center is protected from tidal flooding by levees located beyond the boundaries of NASA property. Any project that would remove this protection would require its own study of resulting environmental impacts. A mitigation measure that NASA would expect to see for such a project would be the construction of new levees to maintain the tidal flood protection that currently exists. This would still leave a large portion of the SWRP, located on NASA property, protected by a levee. The permanent storm drain pump station could then be relocated within the new limits of the SWRP.

NASA believes that it has a right to continue to discharge storm water that naturally flows from the western portion of Moffett Field in accordance with the findings of the California Supreme Court case "Heir v. Krull, 160 Cal. 441 444":

> "... Every landowner must bear the burden of receiving upon his land the surface water naturally falling upon land above it and naturally flowing to it therefrom..."

18-4: As described in Mitigation Measure AES-1, NASA and its partners would develop design guidelines for the Bay View area to require setbacks from Stevens Creek and the Western Diked Marsh and to ensure harmonious design to prevent significant visual impacts. Views from the Stevens Creek Trail are addressed in Mitigation Measure AES-5, which states layout would preserve view corridors. According to NEPA, these design guidelines would not require publication of a Supplemental EIS, but they would be subjected to analysis to ensure that they successfully implement this mitigation measure.

18-5: As described in Mitigation Measure AES-5, NASA and its partners would use site planning to preserve views through the Bay View area from the Stevens Creek Trail. According to NEPA, implementation of this mitigation measure would not require publication of a Supplemental EIS, but it would require analysis of proposed site layouts to ensure that they prevent significant visual impacts.

18-6: Most of the proposed burrowing owl preserve areas support the current burrowing owl population at the Center and provide for optimal habitat. Where proposed preserves do not provide optimal habitat, NASA would remove obstacles from the habitat preserves and the preserve areas would be restored to a more natural state in order to improve the habitat value.

18-7: NASA will continue to implement standard procedures for short-term disturbances as described in Appendix F: *Burrowing Owl Habitat Management Plan*. This includes timing construction outside of nesting season, maintaining a 76 meter (250 foot) buffer zone during the breeding season and a 49 meter (160 foot) buffer zone during the non-breeding season, and passively relocating owls if necessary. The term "as much as possible" was included in Mitigation Measure BIO-11a so that some types of activity could occur within the habitat area or within the buffer zones if it is determined by a qualified owl biologist that the activities will not disturb the owls. BIO-11a states

that "if it is not possible to maintain these distances (76 meter/250 feet, 49 meter/160 feet), NASA would work with a qualified owl biologist to determine appropriate distances from active burrows, fence burrows off from construction activities, and provide owls the opportunity to move by installing artificial burrows further from the construction areas before construction begins."

18-8: The language requested in this comment has been added to Mitigation Measure BIO-11b in this Final EIS.

18-9: Mitigation Measure BIO-19 has been added in this Final EIS to increase the open space buffer between development and the wetlands in the Bay View area to 61 meters (200 feet) in Mitigated Alternative 5 (Preferred Alternative).

18-10: Mitigation Measure BIO-1 has been changed to discourage use of roads adjacent to the coastal salt marsh. This would ensure protection of salt marsh harvest mice from impacts due to construction traffic.

18-11: Mitigation Measure REC-1 has been modified in this Final EIS to state that NASA would develop additional recreational facilities to serve new employees and residents in development areas on the Ames Research Center site. Although the exact location of these sites is not known at this time, NASA is committing itself to find locations for the needed facilities on the ARC site if Alternatives 2, 3 or 4 were to be developed. At this time, Mitigated Alternative 5 (which includes adequate recreation facilities) is the Preferred Alternative, so it appears unlikely that Alternatives 2, 3 or 4 would be developed or that additional development of recreational facilities would be required.

18-12: The extension of the Bay Trail through Moffett Field, if implemented, will serve as an important regional recreational amenity. NASA fully supports this trail extension, and has entered into an agreement to plan for Bay Trail construction on the site. As noted on page 2-73 of this

EIS, however, the Bay Trail extension is being completed as a separate project, is not part of the NADP, and is not covered by this EIS. There is no recreation impact of any of the alternatives that would require the construction of the Bay Trail extension as a mitigation measure.

18-13: The proposed storm drain system described in Section 4.5 has been modified in this Final EIS to slow the rate of discharge into the Storm Water Retention Pond (SWRP) from the Bay View area.

18-14: The storm drain system described in Section 4.5 has been modified in this Final EIS to show that a permanent pump would be installed at the SWRP to reduce or eliminate flooding while providing for better management of the pond. NASA is aware that the installation of a pump on MROSD land at the SWRP would require approval by the MROSD.

18-15: As described in Section 4.5 as modified in this Final EIS, the installation of a permanent pump would reduce or eliminate flooding through better management of the SWRP. This would reduce existing impacts that current flooding may possibly have on nearby sensitive habitats.

NASA has changed the design of the storm drain system to increase infiltration, retention and detention of stormwater flows in the development areas.

18-16: Please see response to Comments 18-13 and 18-15.

18-17: This comment recommends that the EIS be withdrawn and revised to address issues discussed in this comment letter. NASA has reviewed this request, along with the comments in this letter and all other letters, and does not believe that recirculation of the Draft Programmatic EIS is needed. This Final Programmatic EIS responds

to all comments received without significantly changing either the project parameters or the identified impacts. Hence withdrawal of the previous Draft Programmatic EIS is not necessary.

METROPOLITAN TRANSPORTATION COMMISSION

bcdc
SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION

ABAG
ASSOCIATION OF BAY AREA GOVERNMENTS

Regional Airport Planning Committee

January 28, 2002

Ms. Sandy Olliges
Environmental Services Office
NASA Ames Research Center
Mail Stop 218-1
Moffett Field, CA. 94035-1000

Subject: Draft EIS for NASA Ames Development Plan

Dear Ms. Olliges,

I am writing this letter at the direction of the Chair of the Regional Airport Planning Committee, an advisory committee to the Metropolitan Transportation Commission (MTC), Association of Bay Area Governments (ABAG), and the Bay Conservation and Development Commission (BCDC). This committee is charged with preparing and maintaining a Regional Airport System Plan for the nine county San Francisco Bay region, and this plan is included in MTC's adopted long range transportation plan for the Bay Area. The Regional Airport System Plan is further linked to the Bay Conservation and Development Commission's Bay Plan and the designated uses for various aviation facilities around the Bay. 19-1

Given that the Regional Airport System Plan contains specific statements as to the regional aviation interest in Moffett Field, we have several concerns about the process and evaluation that form the basis for the subject draft document.

1. Neither ABAG nor MTC have had an opportunity to comment on the DEIS, as it does not appear that either agency received a copy of the DEIS. We understand that NASA received an earlier letter from the San Jose International Airport requesting that the DEIS be sent to us for our review. 19-2

2. The DEIS should identify the future use of Moffett Field for civil aviation as a significant area of controversy, as this was certainly the case based on comments from local cities during preparation of the latest (2000) Regional Airport System Plan. To the extent that proposed development plans at Moffett Field would either significantly limit or foreclose future civil aviation use of the airfield because of the placement of incompatible land uses near the airfield (e.g., housing), the proposed development plans would continue to be an area of controversy and could trigger the need for a focused study on local and regional aviation requirements (see next item). 19-3

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3. Consistency of the proposed project with regional plans is a key consideration in any CEQA or NEPA document. The DEIS should address consequences of proceeding with the project on the RASP policy below:

RAPC recommends that the Plan protect future options by indicating a regional interest in civil aviation use of Travis AFB and Moffett Federal Airfield if these facilities become available in the future (These facilities are not available now, nor can their future availability be predicted).

- *Decisions that could foreclose future use of any federal, military, or general aviation airport facilities should be subjected to a focused study on the effect of such a closure on local and regional aviation requirements.*

19-4

4. The DEIS should explain the level of aviation demand assumed in the analysis and discuss the compatibility of proposed development plans near the airfield from the standpoint of aircraft noise and safety. This land use compatibility analysis should be conducted for at least two aviation activity scenarios: 1) the continuing long term use of the airfield for federal/NASA purposes and the likely levels of aircraft activity associated with the NASA mission, and 2) use of the airfield for civilian aviation, assuming it is no longer operated by NASA.

19-5

5. MTC normally comments on regionally significant development proposals, such as the Ames Development Plan. As part of these comments MTC reviews the adequacy of the regional traffic analysis and proposed traffic mitigation programs. Since, the DEIS was not available, MTC has not had an opportunity to conduct its normal review of this DEIS.

Without having the full DEIS for review, it nevertheless appears that there could be significant concerns that need to be addressed in the Final EIS. It further appears that the regional agencies would benefit from an extended comment period. The Chair of the Regional Airport Planning Committee has requested that I ask NASA to extend the comment period beyond the January 28, 2002 deadline to provide this additional time for comment.

19-6

Sincerely,

Chris Brittle

Chris Brittle
RAPC staff liaison

LETTER 19

Chris Brittle, RAPC Staff Liaison, Regional Airport Planning Committee, January 28, 2002.

19-1: This is an introductory and background comment about the Regional Airport Planning Committee. No response is required.

19-2: A Notice of Intent to Prepare an Environmental Impact Statement for the proposed NASA Ames Development Plan was published in the Federal Register on June 16, 2000, and was also published in local newspapers at that time. Copies were mailed to NASA's NEPA mailing list, which includes both the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC). In addition, individual letters were mailed by NASA on June 30, 2000, to James T. Beall, Jr. of MTC and Michelle Fadelli, Manager of Communications and Governmental Affairs for ABAG, requesting their participation as cooperating agencies. As cooperating agencies, MTC and ABAG would have been able to work with NASA on the drafting and/or review of the administrative draft versions of the Draft Programmatic EIS. ABAG declined to participate as a cooperating agency; no response was received from MTC.

Scoping for the Draft Programmatic EIS was held during July 2000. No comments were received from either MTC or ABAG.

Melissa Barry of ABAG was mailed a complete copy of the Draft Programmatic EIS on CD ROM during the last week of November, 2001. Victoria Eisen of ABAG was mailed a complete hard copy with all appendices during the last week of November, 2001. They also received a fact sheet describing NASA's proposed Development Plan, the NOA, and a notice of the public meeting dates.

Mark Roddin of MTC was mailed a complete copy of the Draft Programmatic EIS on CD ROM during the first week of December, 2001. He also received a fact sheet describing NASA's proposed Development Plan, the NOA, and a notice of the public meeting dates.

19-3: Identification of future use of Moffett Field for civil aviation has been added to the Executive Summary, Section B as an area of controversy.

As regards the compatibility of the proposed development project with the airfield, Ames Research Center has applied Federal Aviation Administration (FAA) civilian standards for preliminary planning purposes.

The planning for uses adjacent to the airfield is based on the airport operating clearances for civilian airports as required by the FAA. The controlling documentation for the Moffett airfield are based on the "Part 77 FAA Regulations," and a review of these requirements was done in parallel with the NASA Research Park planning efforts.

New sections discussing project compatibility with airfield operations has been added to Sections 3.2 and 4.2 of this EIS. This analysis finds that the alternatives would be compatible with the existing airfield operations.

19-4: A description of the cited Regional Airport System Plan has been added to Section 3.1 of this Final EIS. An analysis of the alternatives' consistency with this plan has been added to Appendix A.

19-5: An analysis of how the alternatives would affect the physical or operational use of the airfield has been added to Section 4.2 of this Final EIS. This analysis assumes current airfield operations as described in commentor's scenario one. Use of the airfield for civil

aviation, commentor's scenario two, is not within the scope of the project. Please see also the response to Comment 19-3.

19-6: Please see the response to Comment 19-2. The comment period extended from the publication of the Notice of Availability in the Federal Register on November 26, 2001 until January 28, 2002. NASA believes this comment period, which exceeded federal standards, was adequate, and that MTC was given adequate opportunity to participate in the NEPA process.

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Department of Planning, Building and Code Enforcement

JOSEPH HORWEDEL, ACTING DIRECTOR

January 28, 2002

Ms. Sandy Olliges
NASA Ames Research Center
Environmental Services Office
Mail Stop 218-1
Moffett Field, CA 94035-1000

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE NASA AMES DEVELOPMENT PLAN (FILE NO. OA02-01-002)

Dear Ms. Olliges:

The City of San Jose appreciates the opportunity to review and comment on the Draft Environmental Impact Statement (EIS) for the proposed NASA Ames Development Plan (Plan). The City of San Jose has reviewed the Draft EIS and is concerned with the need for additional housing that would be generated by this proposal. The EIS indicates that future development under Alternatives 2 through 5 would contribute to the Santa Clara County regional housing shortage. The additional jobs generated by buildout of the Plan contribute to the regional housing demand, thereby worsening the current jobs/housing imbalance for the region. The City of San Jose requests that the Plan and EIS be revised to include an alternative that provides substantially more housing units within the project area to reduce this regional housing imbalance. Providing additional housing units within the project area would also likely reduce impacts on the regional transportation system as identified in the EIS.

20-1

Thank you for the opportunity to review and comment on this Draft EIS. If you have any questions regarding these comments, please contact me at 408-277-4576.

Sincerely,

Joseph Horwedel, Acting Director
Planning, Building and Code Enforcement

C: Jennifer Galliart

OA02-01-002 DEIS NASA Ames Ltr.doc/JAM

801 N. First St. Rm. 400, San José, CA 95110 **tel** (408) 277-4576 **fax** (408) 277-3250 www.ci.san-jose.ca.us

LETTER 20

Joseph Horwedel, Acting Director, Planning, Building and Code Enforcement, City of San Jose, January 28, 2002.

20-1: Please see the response to Comment 14-27. The additional housing units described in Comment 14-27 would reduce impacts on the regional transportation system, as suggested by the commentor.

January 28, 2002

Ms. Sandy Olliges
NASA Ames Research Center
MS 218-1
Moffett Field, CA 94035

COMMENTS REGARDING DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR NASA AMES DEVELOPMENT PLAN

Dear Ms. Olliges:

The City of Mountain View appreciates the opportunity to provide comments to NASA Ames Research Center (NASA) regarding the November 2001 Draft Environmental Impact Statement (DEIS) that has been prepared for its Ames Development Plan (ADP).

The City strongly supports NASA's land use concept for developing a world-class, shared-use educational and research/development campus. The proposed uses under this concept appear to be consistent with the recommendations from the Joint Cities of Mountain View and Sunnyvale Community Advisory Committee (CAC).

In addition, the City lauds NASA's plans for the proposed sustainability features included in the development such as energy efficiency and reclaimed water usage. 21-1

The City does, however, have some serious concerns regarding the significant and unavoidable impacts to traffic circulation, air quality and the jobs/housing imbalance identified by NASA in the DEIS document for the preferred development alternative.

The City is concerned that the DEIS does not adequately identify and describe the full extent of the impacts that will be felt by the City of Mountain View, its residents and its business community as a result of the implementation of the preferred development alternative. The City is concerned that these impacts could potentially undermine the City of Mountain View's continuing quality of life and economic viability.

OFFICE OF THE MAYOR AND CITY COUNCIL
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Specifically, the City has the following concerns about the environmental review conducted by NASA for its preferred development alternative for the ADP:

- The DEIS did not identify all relevant and reasonable traffic and circulation mitigation measures that could be implemented to minimize the impact of the proposed development project.

- The traffic analysis included in the DEIS is based on calculations and assumptions that are far too optimistic and dependent upon one another.

- NASA's environmental analysis should have more thoroughly and creatively studied how additional housing units could be accommodated within the proposed development area to lessen the impact the proposed development will have on the current regional jobs/housing imbalance.

- The mitigations proposed in the DEIS to address the impacts the preferred development alternative will have on City infrastructure are inadequate.

- The process used in the DEIS for evaluating potential air quality impacts that could be generated from the implementation of the preferred development alternative was too narrowly focused and did not adequately address the possibility that the ADP project might not occur as described in the DEIS.

- The environmental analysis included in the DEIS did not adequately consider the current characteristics of the Bay View area that make it an inappropriate location for the amount and type of development proposed for that area.

21-2

Each of these concerns is discussed in greater depth below as well as additional concerns regarding other impacts from the ADP development that will significantly impact the quality of life for the City of Mountain View and its residents. For each concern, the City recommends a proposed next step for NASA to more adequately address the impacts.

The City believes that in order for the Environmental Impact Statement to meet the legal and procedural requirements of the National Environmental Protection Act (NEPA), NASA must address and respond to each of the issues identified in this letter through the provision of additional information and/or by conducting additional analyses prior to the completion of the final EIS and/or issuance of the Record of Decision (ROD).

Additionally, NASA should be aware that the City of Mountain View will not support any funding requests that NASA may make to Federal and/or State agencies to implement its preferred ADP development alternative unless and until NASA reasonably addresses the concerns outlined in this letter. **21-2**

Mitigation of Traffic Impacts

The City believes that the DEIS did not identify or fully consider all relevant and reasonable traffic and circulation mitigation measures that could be implemented to improve the proposed development project.

NEPA requires that an environmental impact statement, such as the one NASA has prepared for the ADP, must identify all relevant and reasonable mitigation measures that could improve a project, even if those measures are outside the jurisdiction of the lead agency (i.e., NASA) or the cooperating agencies.

Examples of how NASA did not meet the NEPA standard in reviewing all relevant and reasonable traffic mitigation options include:

- Mitigation Measure CIR-1 concludes that "large-scale freeway widening projects are beyond the scope of a single new development." **21-3**

  This conclusion understates the scope and scale of the ADP project. The proposed ADP is not a "single new development" but rather a substantial redevelopment project with a total build-out of approximately 8.4 million square feet. It is common for major redevelopment projects in Santa Clara County and elsewhere in California to include the construction of major elements of infrastructure, both local and regional (e.g., interchange modifications, intersection grade separations, roadway widening, new and interconnected traffic signals, etc.), that are necessary to serve the redeveloping properties and to reduce or offset some of the project's impacts on transportation systems.

  Next Step: Prior to the publication of the final EIS and ROD, NASA must work closely with the City of Mountain View and the Valley Transportation Authority to identify what improvements to the transportation infrastructure can be funded and/or built by the development to mitigate or offset some or all of the significant traffic impacts that were identified in the DEIS.

- It appears that NASA did not pursue an evaluation of a potential bridge crossing across Stevens Creek at Charleston Road because construction of the bridge would not eliminate the need for intersection improvements.

  Once again, if the NEPA standard for reviewing all relevant and reasonable traffic mitigation options had been applied by NASA in its review of the potential bridge crossing, the DEIS analysis should have evaluated the extent to which the bridge could contribute to a reduction in the overall impact on traffic and circulation by providing alternative roadway capacity.

  The construction of the bridge may not reduce the traffic impacts resulting from the ADP to below a level of significance, but its existence could contribute to a further reduction in traffic and circulation impacts resulting from the ADP and should have been evaluated in greater depth as part of the environmental review.

  Next Step: NASA must conduct an analysis and evaluation of the potential benefits of a potential Charleston Road bridge crossing in accordance with NEPA standards prior to the completion of the final EIS and ROD.

21-4

- There is no evidence that NEPA standards for identifying all relevant and reasonable mitigation measures that could improve a project were applied in NASA's evaluation of potential improvements to the Moffett Boulevard/ Highway 101 interchange.

  Mitigation Measure CIR-4a concludes without any supporting analysis or data that it is infeasible to improve the Moffett Boulevard/Highway 101 interchange because of "cost, political and ownership considerations."

  The City believes that it is feasible to improve the Moffett Boulevard/Highway 101 interchange and that consideration of additional alternative mitigation scenarios should have been evaluated in the environmental review. The City further believes that improvements at the intersection could increase capacity, access and operations and thus substantially mitigate the significant and unavoidable impacts anticipated to increase vehicle trips and traffic congestion at several City intersections near the ADP project area.

  The City is very concerned about these impacts and recommends further evaluation of potential infrastructure improvements to the local and regional transportation systems to mitigate some of the impacts.

21-5

Next Step: Prior to the publication of the final EIS and ROD, NASA must work closely with the City of Mountain View and Valley Transportation Authority to identify what improvements to the transportation infrastructure can be funded and/or built by the development to mitigate or offset some or all of the significant traffic impacts that were identified in the DEIS. **21-5**

Traffic Analysis Deficiencies

The City is also concerned that the traffic analysis included in the DEIS is based on calculations and assumptions that are far too optimistic and dependent upon one another.

Specifically, the City has several concerns about the adequacy of the traffic analysis conducted for the project, including:

- The DEIS did not provide adequate justification for the very ambitious 22 percent trip reduction (plus an additional 10 percent reduction for internal-only trips) anticipated because of the Traffic Demand Management (TDM) program that is planned. **21-6**

  While the City supports the TDM efforts NASA is attempting to include in its project, the City is concerned that the 22 percent trip reduction being factored into the traffic analysis is not realistic given the existing realities of traffic in Santa Clara County.

  Additionally, the traffic analysis relies on live/work patterns without either explanation or justification and dismisses all regional mitigation without any significant analysis or consideration.

  Next Step: Prior to the publication of the final EIS and ROD, NASA must provide additional explanation/justification regarding how the 22 percent TDM figure was derived and how it will be achieved.

- Because the environmental review was done at a program level, the parking analysis does not mention where or when the parking will be provided. However, the timing of when the parking will be provided will significantly impact the TDM plan and affect the percentage of vehicles that drive to the site or a nearby transit station. **21-7**

Next Step: Prior to the publication of the final EIS and ROD, NASA must conduct a more detailed parking supply and demand analysis. This analysis must be tied to the phasing of development at the site. **21-7**

- The City is concerned that without mention of phasing development, it is possible that commercial and other service uses may lag behind other parts of the development. If this happens, residents and workers at the ADP may well seek these services off-site. These include restaurants for lunch, day care and schools for children and other services.

  Next Step: Prior to the publication of the final EIS and ROD, NASA must commit to a phasing schedule for its ADP development to ensure that development is phased appropriately to minimize not only traffic impacts but also impacts to air quality and the current regional jobs/housing imbalance. **21-8**

  In the absence of NASA conducting a phasing analysis or committing to a phasing schedule for its ADP development prior to the completion on the final EIS and ROD, NASA must revise the EIS to include an analysis and discussion of "what if" scenarios and a sensitivity analysis to test these scenarios should be provided to better reflect the potential impacts that will result from the ADP project.

- A large project, such as the proposed ADP, will require a detailed construction schedule over a long period of time. No mention is made of truck trips, haul routes or impacts of construction vehicles either on-site or off-site.

  Next Step: The final EIS and ROD must include detailed information regarding the schedule for constructing the ADP to ensure that the development occurs in a way that minimizes traffic impacts as well as impacts to air quality and the current regional jobs/housing imbalance. **21-9**

- The traffic analysis refers to both the Metropolitan Transportation Commission (MTC) and City of Mountain View travel forecast models. Was the Valley Transportation Agency (VTA) model also used? The VTA model provides reliable forecasts for Santa Clara County through 2025 and was the basis for the Highway 101/85 North Interchange project study report traffic operations analysis because of the need for a regional roadway analysis. If the VTA model was not used, additional information is needed regarding how the MTC model forecasts compare to the VTA model for the roadway segments analyzed in the DEIS. **21-10**

Next Step: NASA must address each of the concerns and questions outlined above in the final EIS. 21-10

- The entire traffic analysis is a fragile set of interrelated factors with each assumption and conclusion being built on a related premise or assumption and each calculation assuming the most optimistic possible result.

  Individual technical calculations and trip generation factors may be accurate, but their bases are often unsupported in the DEIS document.

  The City is concerned about the potentially severe traffic impacts that may occur if any or all of the basic assumptions included in the traffic study fail (e.g., if the 22 percent TDM reduction assumptions are not achieved, if the retail component of the ADP is not built until the end of the project build-out, if employers on-site balk at the idea of charging for parking, if construction of the housing component of the ADP is delayed, if environmental constraints preclude or limit development in the Bay View area of the ADP and/or if most of the residents of the on-site housing do not work on-site). 21-11

  Unfortunately, the City of Mountain View may end up taking the brunt of these traffic impacts. As congestion on the freeway and streets within and adjacent to the ADP worsens, traffic will spill over onto local Mountain View streets.

  Next Step: NASA must address each of the traffic analysis-related concerns and questions outlined above in the final EIS and ROD.

Impact to Jobs/Housing Imbalance

The ADP DEIS acknowledges that the preferred development alternative would contribute further to the current regional jobs/housing imbalance. According to the DEIS, the preferred development alternative would make the current jobs/housing imbalance even worse by creating the need for an additional 3,100 housing units. 21-12

The City believes that the housing need generated by NASA's proposed development is actually closer to 4,000 housing units based on the averages that the Association of Bay Area Governments (ABAG) is trying to achieve on a regional basis.

Part of the proposed ADP project area is located within the City of Mountain View's sphere of influence. Additional job growth within a sphere of influence is typically included in the totals for that jurisdiction. As such, additional job growth at Moffett 21-13

Field will impact future analyses done for future developments in Mountain View to comply with the California Environmental Quality Act (CEQA), future Housing Element updates and other jobs/housing analyses.

The City is already being challenged to meet the State requirement of identifying sufficient land to accommodate 1,000 additional housing units in addition to land already zoned for housing in the City. Any actions by NASA or others that further contribute to the existing jobs/housing imbalance in the City and region are of great concern. The City of Mountain View should not be held responsible for rectifying any portion of the housing needs deficit that was created by NASA as a result of its ADP development. **21-13**

As was noted earlier in this letter, NEPA requires that an environmental impact statement identify reasonable mitigation even if it is not within the lead agency's jurisdiction.

NASA's environmental analysis should have more aggressively pursued consideration and analysis of locating additional housing units in other areas of the proposed ADP development site to provide further mitigation to the significant and unavoidable impacts that the ADP project will have not only on the current regional jobs/housing imbalance but also to traffic and air quality in Mountain View and the region. **21-14**

Next Steps: Prior to the completion of the final EIS and ROD, NASA must:

- Provide for the construction of a significant number of additional housing units to be built within the ADP development site and/or commit to implementing other mitigations such as payment of housing impact fees to local communities and/or contributions to regional housing programs such as the Housing Trust of Santa Clara County. **21-15**

- Revise the anticipated additional housing need figure from 3,100 to closer to 4,000 based on ABAG calculations. **21-16**

- Also, in order to fully determine the impact the preferred ADP development alternative will have on the existing jobs/housing imbalance in Mountain View, NASA must provide additional information regarding the phasing of its development for the ADP to clarify whether the on-site housing units will be available when employees are hired to meet some of the demand for housing as new employment-generating uses come on-line in the ADP. **21-17**

The City is concerned that if employment significantly precedes the housing available on-site, a substantially greater impact to traffic, air quality and the jobs/housing imbalance could occur than what is discussed in the DEIS. 21-17

Air Quality Impacts

The DEIS states that the preferred development alternative for the ADP project, even with the substantial reduction in vehicle trips projected in the TDM, will result in emissions of air pollutants from automobiles and construction equipment that would exceed significance thresholds established by the Bay Area Air Quality Management District (BAAQMD). The DEIS concludes that this impact is significant and unavoidable. This is another issue of concern for the City of Mountain View. 21-18

Despite the acknowledged importance of construction timing and the impact of construction traffic to the level of air pollution anticipated, the DEIS document does not: 21-19

- Include an evaluation of the amount of traffic that will be generated by the hauling of 220,000 cubic yards of fill to the Bay View area.
- Does not address the air pollution that would occur from hauling that fill. 21-20
- Provides no discussion of how NASA's limits on construction emissions could affect the development of housing in the Bay View area which is so critical to minimizing the anticipated traffic impacts of the preferred development alternative.

The City is concerned that the process used in the DEIS for evaluating the traffic/construction and traffic/air pollution impacts of the preferred development alternative was very narrowly focused and did not adequately address the possibility that the project might not occur as described in the DEIS. If filling the Bay View area to the necessary elevation would generate significant air quality impacts, the City is concerned that a decision may be made not to pursue the residential development component of the ADP planned for the Bay View area at all or to postpone the residential development to an undefined future date. The anticipated reductions in traffic would then not occur, the jobs/housing imbalance would not be addressed and the traffic and air quality impacts from the ADP would be significantly greater than identified in the DEIS. 21-21

Next Steps: Prior to the completion of the final EIS and ROD, NASA must:

- Provide further evaluation of the interrelated environmental impacts and benefits of Bay View area residential development and evaluation of the feasibility of developing this area. **21-22**

- Commit to building residential units in another part of the ADP if it is determined that residential development in the Bay View area is not feasible. **21-23**

- Include a phasing schedule for the ADP project in the ROD that commits NASA to building the residential units in the early phases of the project to ensure that traffic and air quality impacts are not substantially worse than identified in the DEIS. **21-24**

Impacts on City Infrastructure

The City of Mountain View has significant concerns with the mitigations proposed in the DEIS for impacts from the preferred ADP development alternative to the City's sanitary sewer system and treatment capacity.

- Because the Palo Alto Regional Water Quality Control Plant (PARWQCP) counts all of NASA's sewage flow as originating in Mountain View, substantial increases in flow that could result from the implementation of the preferred development alternative may impact Mountain View's ability to serve future development elsewhere in the City.

  As was noted in the previous section of this letter, all future discretionary actions (i.e., the approval of new development) by the City will be governed by CEQA. Once NASA approves its preferred development alternative for the ADP, the impacts from the development will fall into the background or cumulative conditions that CEQA requires to be reflected in future environmental reviews. **21-25**

  Since the preferred development alternative identified in the DEIS does not propose to meet all of its own off-site infrastructure requirements and is dependent on improvements initiated, built and paid for by others (with NASA contributing a portion to the cost), future private development approved after the ADP will either face deficiencies in the City's sewer infrastructure or be required to bear the costs of the improvements. Once again, this could have a significant chilling effect on future development (both commercial and residential) in the City.

Unless NASA commits to ensuring the construction of the required sewer line and pump station improvements, the burden of paying for the additional infrastructure required to accommodate the preferred development alternative will fall on the City and/or future private development in Mountain View.

Next Step: The final EIS or ROD should either commit NASA to constructing the new sewer lines and pump station improvements prior to beginning development activities or be revised to reflect the impacts that will occur if the ADP generates sewage in excess of the City's and/or the PARWQCP's existing infrastructure and capacity.

21-25

- The DEIS only states that there is currently plant capacity available at the PARWQCP. The document should identify the available capacity of the plant that is in excess of the capacity required to serve the build-out of the General Plans and approved development projects in the communities participating in the PARWQCP.

  Next Step: NASA must revise its final EIS and ROD to identify the available capacity of the plant that is in excess of the capacity required to serve the build-out of the General Plans and approved development projects in the communities participating in the PARWQCP.

21-26

- The DEIS assumes and presents as a mitigation NASA's contributing its fair share when the City upgrades its existing sewer lines and the golf course pump station. This is not a sufficient mitigation.

  Next Step: Prior to the completion of the final EIS and ROD, NASA must identify and commit to constructing specific additional infrastructure improvements to mitigate these impacts.

21-27

- At this time, the City of Mountain View has no approved projects or plans to expand either its sewer lines or pump station. The DEIS does not accurately reflect the uncertainty of when or if those improvements will take place, nor does it detail the actions NASA will take if the City of Mountain View is unable or unwilling to undertake an expansion/upgrade of its sewer system.

  Next Step: NASA shall cooperatively work with the City to commit to the scheduling, construction and funding of infrastructure improvements needed.

21-28

- The DEIS also is deficient in its discussion of the potential public health impacts that may occur if the ADP's preferred development alternative generates sewage in excess of the existing system's capacity. **21-29**

  Next Step: NASA must include this analysis in its final EIS and ROD.

Feasibility of Development in the Bay View Area

The City is concerned that the Bay View area of the ADP site may not be an appropriate location for the amount and type of development that is being proposed. Among the City's concerns are:

- The development of the Bay View area will require a significant amount of fill to be brought into the area. As mentioned earlier, there will undoubtedly be traffic and air quality impacts associated with bringing in 17,000 truckloads of fill. **21-30**

- The City is also concerned about the impact placing 220,000 cubic yards of fill in the Bay View area will have on the wetlands and other sensitive habitats adjacent to the proposed development area. **21-31**

- The City is concerned that locating housing and child-care facilities in the Bay View area may be inappropriate because of the noise impacts that will be generated when NASA's wind tunnels are in use. **21-32**

- The proposed housing units in the Bay View area will not be built in close proximity to existing transportation facilities and anticipated commercial/service operations. This will require residents of the Bay View area housing to utilize their vehicles to travel to these sites. This will increase vehicle traffic and congestion within the Bay View area and also impact air quality in the area. **21-33**

  Next Steps: Prior to the completion of the final EIS and ROD, NASA must:

  - Conduct a more realistic assessment and sensitivity analysis of the feasibility of building housing and other facilities in the Bay View area, with particular consideration of the concerns listed above. **21-34**

  - Thoroughly reevaluate current proposed land uses within the ADP and identify other areas of the ADP development site where housing can be built. **21-35**

This will not only lessen the impacts that the ADP will have on the sensitive wetlands and habitats located in the Bay View area but will also provide NASA with an opportunity to locate housing closer to existing transportation and other amenities. 21-35

Opportunity for Continuing Public Comment on Development Impacts

Because the environmental review of the ADP project was done at a program level, it is the City's understanding that the implementation of any future project that is determined to be within the impact threshold of the DEIS would not undergo any additional public review or comment.

The City of Mountain View believes that the data and analyses used by NASA in its review of future project impacts would benefit from public review and comment to ensure the continued accuracy of data and assumptions (e.g., housing projections, traffic projections, air quality conditions, etc.) being used. 21-36

Next Step: NASA must enter into a cooperative agreement or MOU with the City that outlines a process for public review and comment that would ensure the City's involvement in review of future projects/phases of development under the program-level environmental review and that would commit NASA to notifying the City and allowing feedback as specific development components are proposed.

Additional comments from the City are included as an enclosure with this letter. These comments discuss concerns the City has with the potential impacts identified and discussed in the DEIS that may occur from the development of the preferred alternative for the ADP project.

Again, let me articulate the City's support of NASA's impressive efforts to develop an integrated and dynamic research and education facility at Ames Research Center. The City looks forward to continuing to work cooperatively with NASA as it completes this environmental review process and moves toward the ROD regarding implementation of the ADP. 21-37

The City appreciates the opportunity to provide comments into NASA's environmental review of its proposed ADP project. Please contact Deputy City Manager Linda Forsberg or Environmental Management Coordinator Kevin Woodhouse in the

Mountain View City Manager's Office if you have any questions or require additional clarification regarding these comments.

Sincerely,

Sally J. Lieber
Mayor

SJL/LF/9/MGR
601-01-28-02L-E^

Enclosure

City of Mountain View—Additional Comments
NASA Ames Development Plan DEIS

1. Burrowing Owls

Based on its review of the DEIS and Burrowing Owl Habitat Management Plan, the City is concerned that implementation of the preferred development alternative for the ADP project will fragment existing burrowing owl habitats at NASA and does not provide adequate assurances that either the transition process or long-term habitat protection efforts will sustain the burrowing owl population located on-site.

The Burrowing Owl Habitat Management Plan included as part of the DEIS lacks the specificity required to adequately assess the impacts the implementation of the preferred ADP development alternative would have on the burrowing owl population. **21-38**

Next Step: Prior to the completion of the final EIS and ROD, NASA must revise its Burrowing Owl Habitat Management Plan so that it adequately and factually assesses the true extent of impacts the implementation of the preferred ADP development alternative will have on the burrowing owl population.

2. Storm Water Runoff

Implementation of the preferred development alternative for the ADP will certainly generate a substantial amount of storm water runoff. However, the project does not appear to be subject to the Regional Water Quality Control Board's (RWQCB's) new and more restrictive performance standards. The RWQCB implements both Federal Clean Water Act and State laws that limit new runoff into creeks such as Stevens Creek. A discussion of the new requirements should be included in the environmental analysis. **21-39**

As local communities around San Francisco Bay are required to conform more closely to the quantitative standards of the Federal Clean Water Act, including adoption of total maximum daily loads (TMDLs) for local waterways such as Stevens Creek, the contribution of contaminants from the development allowed at NASA will be increasingly critical. **21-40**

Next Step: Prior to the completion of the final EIS and ROD, NASA must revise the environmental impact statement and the mitigation and monitoring program to identify the specific standards and techniques that NASA will use to reduce nonpoint source contamination in runoff from the project site.

3. Hazardous Materials, Site Contamination and Pollution Prevention

The City's concerns regarding the analysis in the DEIS regarding hazardous materials, site contamination and pollution prevention include the following.

- The discussion of remediation at the NASA site (Section 4.7-2) states that the Navy's or MEW companies' contractors may need to design and implement changes in the existing remediation system in order to accommodate future development.

  The City is concerned that contractors responsible for the ongoing cleanup of the existing contamination at Moffett may be diverted from this important remediation work. **21-41**

  Next Step: The DEIS should be revised to acknowledge this point and include some discussion of the extent to which the implementation of the ADP project could delay or detract from the remediation of the existing contamination at the NASA site.

- Also, NASA states that it is planning on conducting interim remedial measures to prevent further plume migration in Section 4.7-6 of the DEIS. However, no detailed information is provided regarding when the measures will be implemented, what specific measures are going to be implemented and why they are being characterized as interim in nature. Because housing was not contemplated as part of the previously approved Conditional Use Permit, it is important that the EIS outline what the measures will be and how the measures will ensure that the groundwater plume will not migrate toward the proposed housing areas. Contamination of soil or groundwater could make locations within the proposed housing area unusable for that use and should be fully disclosed as early in the process as possible. **21-42**

  Next Step: The final EIS and ROD should include identification and discussion regarding the specific remedial measures that NASA will use to prevent further plume migration and an analysis of the anticipated efficacy of the proposed measures.

- Additional information is needed regarding if the proposed day-care use will be located within one-quarter mile of facilities in Mountain View that handle hazardous or acutely hazardous materials. If so, NASA should disclose/describe what measures will be enacted to ensure that the risks to sensitive receptors will be less than significant. **21-43**

Next Step: The final EIS and ROD must specifically state if the proposed day-care use will be located within one-quarter mile of existing facilities in Mountain View that handle hazardous materials. If the proposed day-care use will be located within the quarter-mile radius, NASA must identify and describe the measures it will implement to ensure that the risks to sensitive receptors will be less than significant. **21-43**

4. Noise

The City has the following questions and concerns regarding the noise analysis conducted as part of the ADP DEIS:

- Although a noise analysis was prepared for the environmental review and is referenced in the documentation, a copy of the technical report was not included in the DEIS appendices. **21-44**

  Next Step: NASA must include a copy of the noise analysis in the final EIS.

- The City is concerned that the document does not fully discuss the impacts of placing housing and day-care uses within a site (e.g., the Bay View area) subject to both wind tunnel and airfield noise. **21-45**

- Also, the DEIS does not include an analysis of off-site construction noise impacts that will occur outside of the boundaries of the project area, although such impacts could be significant. **21-46**

  Next Step: The noise analysis that will be included in the final EIS must include a description of construction equipment, routes and materials, as well as information regarding any sensitive uses (e.g., residences, schools, etc.), located along construction/delivery routes.

- The City requests that NASA implement Mitigation Measures NOISE-1a, 1b and 2b to levels that would comply with the City of Mountain View Noise Guidelines, shown in Table 3.10-4 in the DEIS. **21-47**

5. Socioeconomic Impacts

The City of Mountain View believes that the analysis of socioeconomic impacts included in the DEIS could benefit from additional input from the City, particularly the fiscal and service provision impacts that will accrue to the City as a result of the ADP project being developed. **21-48**

- Development of the preferred ADP alternative would impact City services. With the exception of Alternative 3, the DEIS states that revenues to the City

generated by the project would exceed the estimated cost of providing those services and, based on that conclusion, no significant impacts would occur. This analysis is incomplete because it does not discuss any limitations on the City's ability to actually provide the services. **21-48**

- Table 4.14-3 summarizes the anticipated annual fiscal impact to the City of Mountain View resulting from each of the proposed development alternatives. It is very likely that the City of Mountain View will have far greater expenditures as a result of the development of the ADP than what is analyzed in this table. **21-49**

- The City believes it will incur an increase in roadway infrastructure and maintenance costs that will result from the increased traffic generated by the project. **21-50**

- There will likely be increased impacts on Police, Fire and other services as well, resulting from employees working for companies within the ADP project living, traveling through and/or using City amenities and services. **21-51**

Next Step: Prior to the completion of the final EIS and ROD, NASA shall meet with City representatives to obtain additional input from the City regarding the fiscal and service provision impacts that will accrue to the City as a result of the ADP project being developed. NASA shall incorporate this input into a reevaluation and new analysis of the potential socioeconomic impacts that will result from the development of the ADP project. **21-52**

LF/9/MGR
601-01-28-02C^

LETTER 21

Sally J. Lieber, Mayor, City of Mountain View, January 28, 2002.

21-1: This is an introductory comment that expresses the City of Mountain View's support for NASA's land use concept and introduces the City's primary areas of concern. No response is required.

21-2: This comment summarizes the points which follow in more detail in the letter. No response is required here. Each point is responded to below.

21-3: The total project buildout would be 777,000 square meters (8.4 million square feet) with 170,500 square meters (1.8 million square feet) of housing and 57,600 square meters (620,000 square feet) that would be the CASC and museum. Only 178,000 square meters (1.9 million square feet) would be educational and office /R&D. The Preferred Alternative, Mitigated Alternative 5, would not cause any significant impacts to Mountain View intersections. NASA has considered relevant and reasonable traffic and circulation mitigation measures, and has determined that its TDM program and on-site housing result in an adequate level of traffic mitigation. The language in CIR-1 has been changed in this FPEIS to reflect that this is a "project", not a "single new development". CIR-1 has also been amended to state that NASA would work with VTA and Caltrans to consider mitigation measures.

21-4: Although the Preferred Alternative is not expected to cause any significant intersection impacts at any of the study intersections near the Shoreline Boulevard and Moffett Boulevard interchanges along Highway 101, an evaluation of the Charleston Avenue bridge was conducted for this Final EIS and is described on pages 4.3-26 and 4.3-27 of the EIS. The evaluation of Alternative 4 (the most traffic-intensive alternative) and Mitigated Alternative 5 (the Preferred Alternative) showed that improvements would be required at R.T. Jones

Road/Moffett Boulevard - Clark Memorial Drive intersection and that operating levels would be the same with or without the bridge. Since the bridge was found to have no beneficial effect on project impacts, it was not included in the project. The Charleston Bridge is neither a part of the project nor a necessary mitigation measure for it so no further analysis of it is appropriate in this EIS. Implementation of the proposed project would not preclude later construction of the bridge as a separate project.

21-5: The Preferred Alternative, Mitigated Alternative 5, would not have any significant impacts on City intersections. Mitigation measure CIR-4 only applies to Alternative 4, which NASA does not intend to implement.

21-6: NASA has developed an aggressive Transportation Demand Management (TDM) program that would govern all NRP partners, lessees, and tenants. The plan found in Appendix B includes TDM strategies designed to achieve the greatest, reasonable level of vehicle trip reduction, such as parking fees, site-wide EcoPass, a robust shuttle service combined, marketing, guaranteed ride home, and on-site housing.

The goal of the TDM plan is to achieve an Average Vehicle Ridership (AVR) of 1.72 at project build-out. A 1.72 AVR means that for every 100 employees/students coming to the site, 58 vehicles come to the site (100/58 = 1.72).

To understand the percentage of vehicle trips that the NRP would reduce by meeting this target, NASA compared the projected "58-cars-per-100-employee/students" with other Santa Clara County employee travel patterns. The source for comparison was "Commute Profile 2000, A Survey of Bay Area Commute Patterns" conducted by RIDES for Bay Area Commuters. This survey of 400 Santa Clara residents over the age of 18 who are employed full-time, found that

among those working for employers that do not promote TDM strategies, the AVR is 1.16.[6] An AVR of 1.16 is equivalent to 86 cars per 100 employees (100/86 = 1.16). The difference between 86 cars per 100 employees and 58 cars per 100 employees is a 32 percent reduction in vehicle trips ((86-58)/86 = 32%).

NASA believes an AVR of 1.72 is readily achievable given the strategies outlined in the TDM Plan. Documented results from other TDM programs show site trip reduction ranging as high as 27 percent when parking charges were not implemented[7] and as high as 38 percent when parking charges were implemented[8]. Therefore, a 22 percent reduction seemed reasonable given that the proposed TDM is extensive and contains both park charges and other measures.

Because NASA's AVR is partially dependent on the effect of on-site residents (a number that changes between alternatives), NASA separated the trip-reduction impact of the TDM Program due to the presence of on-site housing from the impact of non-residents using alternative modes. For example, it was assumed that all walk trips would be due to on-site housing and that about 70 percent of bike trips

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[6] AVR was not actually calculated by the survey, but mode split data was gathered. To convert mode split to AVR, NASA assumed there were 2.23 passengers per carpool/vanpool. 2.23 passengers is the average vehicle occupancy per HOV found throughout the Bay Area as determined by the commute profile survey. Source: Valk, Peter and Mikal Wasch, "Messing with Success: The Boeing Company's Trip Reduction Program." Presentation at 1998 ACT Annual Conference.

[7] Valk, Peter and Mikal Wasch, "Messing with Success: The Boeing Company's Trip Reduction Program." Presentation at 1998 ACT Annual Conference.

[8] Shoup, Donald C. and Richard W. Willson, "Federal Tax Policy and Employer-paid Parking: The Influence of Parking Prices on Travel Demand," Prepared for: Commuter Parking Symposium Association for Commuter Transportation Seattle, Washington December 6-7, 1990 .

would be due to on-site housing. Transit trips are also influenced by the amount of on-site housing, as more people are able to use the internal shuttle from the Bay View area to the NRP.

Looking only at those trips that would come from employees, students and visitors living off-site, it is estimated that this non-resident population could achieve a 22 percent trip reduction or 67 vehicles per 100 employees/students coming to the NRP (67 cars/100 employees and students vs 86 cars/100 employees). Given the aggressive parking charges and comparative data from other TDM programs, NASA felt that 22 percent would not overstate any trip reduction impact. This is especially true since NASA's 1999 employee survey showed that, at that time, NASA employees generated 71.5 vehicle trips per 100 employees.

The remaining 10 percent difference (32 percent total vs 22 percent from TDM) would be achieved by providing varying levels of on-site housing under each alternative. Depending on the amount of on-site housing, this may actually be more than 10 percent. On-site housing would minimize the number of project-generated vehicle trips since at least one resident in townhome/apartment units and both residents in residence hall units would be required to work or attend classes within the NRP. By charging for parking in the NRP and by providing attractive alternatives (frequent shuttle service, dedicated bicycle facilities and a pedestrian-friendly environment) to travel to and within the NRP area, most travel by residents would be made via non-automobile modes, especially during peak commute periods.

21-7: The NASA Research Park TDM , the concept for which is in Appendix B of this EIS, explains when parking charges would be implemented and where it is anticipated that parking would be located. The NRP TDM Program explains that the NRP site currently has about 1,000 uncontrolled, free parking spaces. Thus, it

would be infeasible to control and charge for parking in the earliest stages of development.

The plan calls for parking to be established as a controlled, priced resource as soon as feasible. This point is contingent upon the phasing of development, the loss of the open, surface parking lots due to construction and the increasing number of employees working on-site. The Transportation Management Association (TMA) would be responsible for working with the partners to manage the introduction of new parking supply and the elimination of the old supply. The TMA and its board would be responsible for determining the point at which parking charges would be implemented. It is estimated that this would take place during Phase 2. Phase 2 would commence when there are 3,000 NADP employees/students on-site. It is anticipated (although not certain) that Phase 1 would occur prior to University construction.

21-8: Please see the response to Comment 15-11 regarding project phasing.

21-9: As stated in Mitigation Measure AQ-2 of this EIS, NASA and its partners would schedule construction to ensure that annual emissions of ozone precursors associated with project construction and operation do not exceed a cumulative total of 100 tons per year. The NASA Development Office would prepare and update a detailed construction schedule prior to construction to implement this mitigation measure.

Prior to actual construction, a detailed construction traffic plan would be developed, including construction truck trips and haul routes.

More information on phasing of housing has been added to page 2-66 of this Final EIS.

21-10: The MTC data used in the transportation analysis was to identify the city of residence for employees within the Sunnyvale-Mountain View

superdistrict. This information was used to help distribute trips on a regional basis (i.e. on freeways and regional roadways) within Santa Clara County and to/from adjacent and non-adjacent counties. The MTC travel demand model was not used in this analysis, but the City of Mountain View's model was used to verify the more localized distribution of project-generated traffic and to evaluate the effect of the Charleston Avenue bridge.

The VTA model was not used for the reason listed on page 3.3-35 of the FPEIS. The forecasts from the VTA model showed Year 2025 volumes that were lower than base year (1997) volumes at numerous locations within the study area. Since both VTA and MTC travel demand model forecasts were not used directly, a comparison of link volume forecasts from these sources cannot be performed as part of the FPEIS analysis.

21-11: Most transportation analyses are based on sets of interrelated factors with assumptions and conclusions that are built on related premises or assumptions. All of the assumptions regarding trip generation and distribution, reductions for housing and TDM measures are disclosed in the FPEIS or more fully explained in the responses to comments.

The commentor raises concerns about a number of specific basic assumptions, which may be addressed as follows:

- The TDM goal of 22 percent is based on comparable commercial and campus projects. The current level of trip reduction at the Ames Research Campus is just over 16 percent with only a limited number of TDM measures in effect. With the extensive array of TDM measures proposed in the TDM Program including on-site shuttles, parking charges, a site-wide EcoPass program, and on-site amenities, a 22 percent reduction is considered reasonable and a higher reduction is possible.

- The entire TDM Program would be part of the lease for any on-site user. The AVR goals would be strictly enforced.
- The housing and on-site retail would be phased with the other development to achieve the TDM goals.
- The environmental issues associated with housing in the Bay View area are addressed as part of this DPEIS. On-site housing would be occupied by NADP or existing ARC employees, students and their families. As with any environmental analysis, the proposed project components must be consistent with those actually developed to meet the legal requirements of the EIS.

21-12: Table 4.14-1 gives a new household demand for Alternative 5 of 4,273, which agrees with the City's comment; then it subtracts the 750 townhome units. It arrives at demand in the Housing Impact Analysis of 3,523. This is an increase from the 3,180 in the DPEIS. The change appears to address the City's comments.

The comment that the "housing need generated by NASA's proposed development is actually closer to 4,000 housing units..." is correct and is consistent with the analysis presented in the FPEIS. The prime difference between ABAG's and NASA's methodologies is that ABAG does not take into account housing supply when assessing need. The DPEIS more accurately projects the NADP's net impact on regional housing demand by subtracting the number of on-site housing units proposed under the NADP from the employee-generated household demand. This analysis is contained in Table 4.14-1 of the FPEIS.

As noted in the response to Comment 14-27, this Final EIS includes a mitigation measure to provide additional housing on-site.

21-13: Additional jobs generated within Mountain View's spheres of influence (SOI) would lead to an increase in the city's' "fair share"

housing allocations from ABAG. The city would also receive "credit" in the fair share allocation process for additional housing units built within its SOIs at ARC. Overall, the commentor is correct that the NADP could potentially increase ABAG's fair share allocation to the city. While this may have policy implications for the city, it would not create an environmental impact beyond the significant, unavoidable impact on housing already identified and partially mitigated in Mitigation Measure SOCIO-1a, and more fully mitigated in SOCIO-1b, 1c and 1d.

21-14: NASA plans to use innovative techniques in the NRP to mitigate the impacts of site contamination so that it does not cause undue risk to the building occupants over the Superfund plume. These techniques involve construction of a pervious substrate under the foundation slab and a ventilation system that would exhaust any vapors coming through the soil safely away from breathing areas. However, even with these techniques the risk is not low enough to allow other portions of the NRP to be used for housing.

At this time NASA does not think it is appropriate to study housing on the east side of Moffett Field since the CANG does not plan to relocate. NASA feels that the Eastside/Airfield is better dedicated to continued use of the airfield as a national and local resource. The golf course on the east side is used as a safety zone for the ordnance storage of the military tenants and therefore it is not an appropriate area for housing.

21-15: Please see the response to Comment 14-27.

21-16: Please see the response to Comment 21-12.

21-17: The housing would be constructed as the new-employment generating uses are developed in the NRP. See also response to Comment 15-11.

21-18: The commentor is correct in stating that the proposed project would result in emissions of air pollutants from automobiles and construction equipment that would exceed significance thresholds established by BAAQMD. This is considered a significant, unavoidable impact of the proposed project, as disclosed in Section 4.4 of this EIS. No further response is required.

21-19: The number of truck trips associated with the hauling of fill to Bay View, which is discussed in section B.2.g of Chapter 2, has been revised downward on page 4.3-29 of this Final EIS to 33 to 49 vehicles per day because of an error in the DPEIS in calculating the required amount of fill. All these vehicles would use the Highway 101/Moffett Field Boulevard interchange. Accordingly, the maximum number of peak hour trips would be less than 10, assuming 20 percent of daily traffic occurs during each of the morning and evening peak hours. As noted in the EIS, these volumes are not expected to significantly affect peak hour intersection operations at the freeway ramps or on-site.

21-20: Section 4.3 of this EIS includes estimates of construction emissions for the entire project. These estimates include site grading activities, truck trips, worker activity, and all other construction equipment. The air pollutant emissions associated with hauling of Bay View fill would make up a small portion of these overall emissions.

21-21: The construction phasing that has been added to page 2-66 of this Final EIS would be followed. Since these air emissions limits are for individual years, their worse case implication would be that housing construction might be delayed for several months until a new calendar year began. In no case would housing construction be delayed to allow for construction of other project components.

21-22: Please see the response to Comment 11-6.

21-23: NASA is committed to housing construction in Bay View and NASA's preliminary analysis shows that such construction would be feasible. As noted in this EIS, NASA is also committed to build housing in Parcel 6 in the NRP, and NASA also expects to dedicate Buildings 19 and 20 in the NRP to housing. NASA is continuing to review the risks of placing housing in additional places within the NRP area, as for example, over the retail establishments. If the housing in Bay View cannot be built, then the project would not proceed beyond the phasing allowed under the amount of housing provided in other areas listed above until a supplemental EIS was prepared.

21-24: Please see the responses to Comments 21-17 and 21-21.

21-25: The existing sanitary sewer system accommodates the peak wet weather flow from Ames Research Center, and other tributary areas, by allowing the flow to back up in the main trunk line that runs through Ames Research Center. This allows the flow to bypass the pumps in the lift station and flow entirely by gravity for the duration of the peak flow. Although this is not in accordance with standard engineering practice, it does function and would continue to do so with the increased discharge from the development proposed under the NADP.

According to the City's engineering staff, the solution to this existing regional problem is not to upgrade the lift station. The solution is to install a new gravity main between Ames Research Center and the Palo Alto Regional Water Quality Control Plan (PARWQCP). The lift station would continue to serve the area immediately surrounding it but would no longer be required to handle discharge from Ames Research Center and other tributary areas upstream. As stated in Mitigation Measure INFRA-2, NASA would contribute its fair share toward construction of the new gravity main.

21-26: The conclusions stated in the EIS are based on the list of cumulative projects provided by the City for the area that is served by the conveyance piping between Ames Research Center and the PARWQCP. The comment asks that NASA's conclusions be based on full buildout of the General Plans of all communities that discharge to PARWQCP. This is not appropriate since it is not known when full buildout would occur. Standard environmental review practice is to base cumulative analysis on known proposed projects.

21-27: As discussed in the response to Comment 21-25 and in the EIS, the increased discharge from the development proposed under the NADP would not alter the current manner in which flows bypass the lift station and flows by gravity during peak wet weather flow. The practice of allowing the flows to back up in the main trunk line that runs through Ames Research Center would continue. It would simply extend farther upstream and take longer to dissipate. This would not impact any users other than NASA.

21-28: Please see the response to Comment 21-25.

21-29: Sewage generation from the alternatives and the ability of the existing waste treatment system to treat this sewage is discussed extensively on pages 4.5-15 through 4.5-24 of this EIS. As noted there, there is sufficient treatment capacity available at both the Sunnyvale Water Pollution Control Plant and the Palo Alto Regional Water Quality Control Plant to treat the waste streams expected under any of the alternatives. It would be conjectural to consider what would happen if additional waste in excess of the reasonably expected amounts were to be generated.

21-30: Please refer to the responses to Comments 21-19 and 21-20.

21-31: Bay View does not contain jurisdictional wetlands areas. Fill that is proposed for this area is required to address public safety issues related

to flooding because the Bay View area lies within the 100-year floodplain. Fill in the Bay View area would be placed only on disturbed upland habitat and non-native grassland. Fill would not be placed on any wetland or other sensitive habitats.

The amount of upland habitat adjacent to the wetlands would be reduced, but a buffer zone of upland habitat would be retained between development and wetland habitat, as required by the addition of Mitigation Measure BIO-19 found in this Final EIS. This buffer zone has been increased in width in the Preferred Alternative in this Final Programmatic EIS. Although development would reduce upland habitat, the impacts to the adjacent wetlands (including encroachment) would be less than significant.

The fill on the Bay View parcels would be engineered, placed, and stabilized in a manner that would accommodate the construction of structures that comply with current safety and earthquake regulations. Thus, the fill would be stable, and would not indirectly impact the wetlands in the North of Bay View area by eroding and causing siltation.

Runoff from the Bay View area would be routed into the proposed stormwater drainage system, which is described in Chapter 2 and Section 4.5 in this Final EIS. This stormwater drainage system would include water quality filters and other mechanisms for ensuring high water quality in the Eastern and Western Diked Marshes, the Stormwater Retention Pond, and other downstream areas.

21-32: The 40x80 and 80x120 wind tunnels are closest to Bay View where housing/childcare facilities are proposed. Maximum noise levels would be less than 70 dBA, which would be considered safe for short-term noise exposure. Cumulative noise exposure (i.e. noise generated by all sources) for the site is shown in Figure 3.10-10 of the EIS. An example of how it was used to evaluate the impacts of placing noise-

sensitive uses within the site for a particular alternative is shown in Figure 4.10-1. Annual average noise levels would be less than 60 dBA, which is compatible with these uses.

21-33: The proposed on-site shuttle system would include the Bay View area and the frequency of service would provide a convenient means for residents to access on-site employment centers, as well as retail stores and recreational areas within the project site. In addition, bicycle lanes will be added to RT Jones Road to connect with NRP. As described in the NRP TDM plan, all parking within the NRP would be controlled and only a limited supply would be provided. The cost of on-site parking, the limited parking supply, the site wide network of bike paths and bike lockers, and availability of shuttle service would help reduce the number of intra-site trips and minimize air quality impacts.

21-34: Please see the responses to Comments 21-19, 21-20 and 21-31 through 21-33.

21-35: NASA is limited in where it can construct housing due to on-site contamination and noise. Please see the response to Comment 21-14.

21-36: NASA will comply with the CEQ regulations regarding public reporting of mitigation implementation and monitoring as stated at 40 CFR 1505.3 (c) and (d).

21-37: This is a closing comment. No response is required.

21-38: NASA recognizes that the Moffett population of burrowing owls is the largest in the area, and its survival is critical to the presence of owls in the region. The implementation of the mitigation measures in the EIS would allow for this population to continue.

Dr. Lynne Trulio's *Burrowing Owl Habitat Maintenance Plan* will be used for guidance for development in the Ames Campus.

The *Burrowing Owl Habitat Management Plan* (BOHMP) provides the most specific and complete information available on the burrowing owl population at Ames Research Center. In fact, this population has been well studied and some of the most complete data on any burrowing owl population anywhere exists for this group. The BOHMP gives very specific data on the size and location of the existing burrowing owl population at the Center over time. These data have been developed during more than 10 years of observation and study by burrowing owl experts.

Most of the proposed development would occur in areas that do not provide owl nesting habitat. The Center has identified other areas, not designated as preserves, which currently provide burrowing owl nesting habitat. No development or roads are proposed in any of these areas. Potential impacts to nesting habitat have been avoided.

Seven potential impacts to owls, which are based on experience with many other development projects in Silicon Valley, are thoroughly described in this EIS; detailed avoidance or other mitigation measures are required for all seven. These mitigation measures have been developed, and some have been tested, by Dr. Lynne Trulio as a result of her research with burrowing owls in the South San Francisco Bay Area. For example, the 25-mile per hour speed limit would provide mitigation against the potential for collision, as the reduced speed would allow for additional reaction time. New roads or transportation corridors would be planned, whenever possible, to be routed away from owl habitat.

The DPEIS and the BOHMP quantify the extent of the physical impact of construction. Impacts to owls of land development are fairly well known. However, the effects on owls of other changes,

such as the impacts of increased vehicle traffic, are more difficult to predict. Therefore, the BOHMP includes extensive monitoring by burrowing owl experts during and after the implementation of the BOHMP to assess impacts of the development. In addition, mitigation measures including education/outreach to workers and residents about the potential impacts to special-status and endangered species from non-native predators, and a continuation of the on-going efforts to control non-native predator species in conjunction with US Fish and Wildlife Service programs, would be implemented. If impacts to owls are found, new measures would be developed and implemented by NASA in consultation with an owl expert and the California Department of Fish and Game.

While the Burrowing Owl Nesting Habitat Preserves, as shown in the *Burrowing Owl Habitat Management Plan*, are patches separated from each other, these patches are all located around the edge of the runway fields, resulting in contiguous grassland habitat used by the owls. These patches are not fragments, but are physically part of the large grassland habitat in the center of Moffett. In addition, these patches are specifically called out for protection because they are traditional, long-term nesting areas for owls at the Ames Research Center. Such long-term nesting sites are extremely valuable to maintaining owl populations. The majority of nests occur on these patches or around the golf course. But, owls do move their nests around from year to year and in 2000 only 5 of the year 2000 nests were in the preserve area. Other valuable existing nesting habitat, especially around the golf course, is not slated for change under the NADP. Many nests also occur in the CANG area. This area was addressed in the CANG EA of 1997.

Moving burrowing owls during the nesting season has been reported to be generally unsuccessful. NASA's current burrowing owl management plan requires that any movement of owl pairs be delayed until young owls have been fledged. In addition, artificial burrows

must be constructed within 15 to 30 meters (50 to 100 feet) of the original burrow. Any moves of a distance greater than 30 meters would be undertaken over the course of several nesting seasons.

Very little foraging habitat for burrowing owls would be lost under Alternative 5 or Mitigated Alternative 5. Housing proposed for the Bay View area would be located so that it would not significantly impact sensitive habitats. A buffer zone in the housing area is proposed which separates sensitive habitat from the development. This housing and affiliated uses would result in the loss of under 11 hectares (28 acres) of owl foraging habitat, but this loss is very small in comparison to the approximately 268 hectares (959 acres) of foraging habitat that would remain. As a result of the location of development and the habitat protection measures, the great majority of areas used for nesting and foraging by owls would remain intact under Alternative 5 or Mitigated Alternative 5.

21-39: As described in Section 4.5 as revised in this Final EIS, the storm drain system has been revised to reflect and comply with the more restrictive system. The revised system would not increase the peak discharge into the Storm Water Retention Pond (SWRP).

21-40: As described in Section 4.5 as revised in this Final EIS, additional detention methods have been incorporated into the design of the backbone storm drain system to reduce off site pollutant loading. In addition, NASA has added a list of Best Management Practices for the project that are listed on pages 2-27 to 2-29 of this Final EIS.

21-41: Implementation of the NADP is not expected to slow the remediation of the Regional Plume. Pursuant to the draft EIMP, NASA's partners would arrange with the MEW and Navy contractors to complete any necessary relocation of pipes and wells, and the contractors would be hiring additional staff to handle the increased workload. Further, the needed remediation wells are already in place and would continue to

pump and treat water throughout the implementation of the NADP. A temporary shut down of particular wells might be required at some point, but it would not affect the overall schedule.

21-42: As described on page 4.7-7 of this EIS, there is a plume of contaminated groundwater moving towards the Bay View area that is believed to be coming primarily from the Orion Park Military Housing area off-site. The Navy, which is responsible for any contamination in the military housing areas, is currently investigating to see whether the source of contamination is in fact in the housing area or is coming from a site upgradient of them. The plume contains chlorinated solvents at a level of contamination that is relatively low compared to the Regional Plume, but is above clean-up level.

To address this issue, NASA is proposing installation of an "iron curtain," a subsurface trench filled with iron filings that cleans water as it flows through, at its property boundary. The iron curtain is characterized in the EIS as an interim measure because it does not clean-up the source of the contamination, which is off-site, but instead prevents the contamination from spreading onto Moffett Field. The entity responsible for the source of the pollutant would have to initiate the main remedial action.

Section 3.7 of this EIS has been amended to provide information on a draft Human Health Risk Assessment being conducted for the Bay View area, and on other remediation to be conducted in areas south of Bay View.

Both the iron curtain and the pump and treat system proposed for the areas south of Bay View are in the conceptual phase. NASA will prepare Removal Action Workplans to evaluate the effectiveness of the proposed treatments; these Removal Action Workplans will be submitted to DTSC for review and approval. After DTSC review, the Removal Action Workplans will also be circulated to NASA's mailing

list of interested members of the public. NASA is beginning work on the Removal Action Workplans now, and plans to have them available for public review in 2003, with construction of the treatment systems beginning in 2004.

21-43: The proposed location of the childcare center is greater than 1/4 mile from the industrial area in Mitigated Alternative 5.

21-44: The noise analysis for the EIS was based on several prior studies analyzing on-site noise sources. The project itself would not directly generate noise; therefore, a project-specific technical noise study is not necessary.

21-45: Please see the response to Comment 21-32.

21-46: The Draft EIS evaluated construction noise impacts from the project on adjacent land uses and found that there may be temporary impacts from time to time. Construction truck traffic is expected to access the site from Highway 101, which currently carries about 5,000 daily heavy truck trips. The increase in truck traffic on Highway 101 would cause no change in noise levels along the highway. Overall, off-site noise impacts due to construction are considered less-than-significant, as noted on page 4.10-7 of this Final EIS. The amount of construction conducted on an annual basis would be limited by requirements of the Federal Clean Air Act, which would further attenuate potential construction noise impacts.

21-47: The City of Mountain View has identified a DNL of less than 55 dB as "Normally Acceptable" and 55 to 65 dB as "Conditionally Acceptable" for residential uses. The City has identified a DNL of less than 60 dB as "Normally Acceptable" and 60 to 70 dB as "Conditionally Acceptable" for commercial uses. Through Mitigation Measure NOISE-1a, NASA plans to mitigate noise to levels that the City considers "Conditionally Acceptable."

21-48: While the EIS does not evaluate the ability of Mountain View's existing facilities to provide additional services, it does calculate the additional cost to the City of expanding its services. The EIS calculates the 2000/2001 per capita expenditures of the City of Mountain View's Recreation Branch and Library Services Department and applies this figure to the additional demand generated by NADP. This analysis includes staff time and capital outlays (i.e. facilities improvements), and therefore estimates the cost of additional staff and facilities to meet the increased demand from NRP residents in on-site housing. The Developer Impact Fees would cover these costs. Mitigated Alternative 5, the Preferred Alternative, includes 2,300 square meters (25,000 square feet) of outdoor recreation space, which would satisfy on-site all of the outdoor recreational demand generated by new employees and students. NASA's partner universities may also include on-site library facilities to serve students and employees, further decreasing the demand on Mountain View's services. In addition, the proposed CASC and Computer History Museum would provide recreational opportunities for the residents of Mountain View.

21-49: Comment noted. This comment states an opinion only, and does not offer any justification for the assertion. Therefore, no further response is possible.

21-50: NASA acknowledges that NADP employees and any additional Mountain View residents would generate a marginal negative impact on the road surfaces in Mountain View. The proposed project is estimated to add between 13 and 853 trips (depending on the project alternative) to City of Mountain View street segments during either the AM or PM peak hour. The Preferred Alternative (Mitigated Alternative 5) is expected to add between 13 and 342 peak hour trips to city street segments. However, it is infeasible to develop a reasonable estimate of additional roadway maintenance costs that the City would incur as a result of these trips. The difficulty lies in the fact that while the traffic analysis identifies the streets where

additional trips occur, it cannot project trip distances which are integral to estimating impact on the roadway surface. The model is simply unable to predict individuals' driving patterns to the level of detail required to calculate trip distances.

Furthermore, the EIS fiscal impact analysis demonstrates that a portion, if not all, of the additional roadway maintenance costs could be recovered through additional sales tax, gas tax, construction tax, and motor vehicle in-lieu fees generated by NRP employees and development in the Bayview section of NRP. Additionally, while the EIS does not project the number of additional Mountain View residents resulting from NADP, it can be assumed that any new Mountain View residents would generate taxable sales, property taxes, and other fiscal revenue intended to cover their infrastructure and service needs.

21-51: As stated in the EIS, any on-site public safety needs would be managed by NASA. As for off-site public safety costs, these, like the roadway maintenance costs addressed in Comment 21-50, cannot be estimated with any reasonable accuracy. While a marginal cost may be generated by NADP employees traveling through or living in Mountain View, the difficulty in estimating this cost lies in the need to calculate individuals' driving and residential patterns and the associated public safety impact. As with road maintenance costs, additional sales tax, gas tax, construction tax, and motor vehicle in-lieu fees generated by NRP employees and development in the Bay View section of NRP would recover a portion, if not all, of these marginal fiscal impacts. New Mountain View residents resulting from NADP would, like any other new resident, cover their share of increased service costs through sales, property, and other taxes accruing to the City. In addition, Ames Research Center's fire protection services, which are currently provided by the California Air National Guard (CANG), are part of the Santa Clara County Fire Mutual Aid Agreement. Thus, if a significant emergency occurred in Mountain View that required

additional fire protection services, the ARC engines and trucks would be available to assist in the response. As it is mutually beneficial, the Mutual Aid Agreement therefore represents no net fiscal impact on the City of Mountain View for fire protection services.

21-52: In preparing this EIS, NASA held several meetings with the City of Mountain View, as requested in this comment.

SANTA CLARA
Valley Transportation Authority

January 28, 2002

NASA Ames Research Center
Development Office
Mail Stop 218-1
Moffett Field, CA 94035-1000

Attention: Ms. Sandy Olliges

Subject: NASA Ames Development Plan – Draft Environmental Impact Statement

Dear Ms. Olliges:

Santa Clara Valley Transportation Authority (VTA) staff have reviewed the Draft Environmental Impact Statement (EIS) for the development plan for the NASA Ames Research Center located north of US 101, east of Moffett Boulevard. NASA is evaluating alternative development plans for the 213-acre Research Park area, 952-acre East Side-Airfield area, the 94.6-acre Bay View area, and the 240-acre ARC Facilities area. We have the following comments.

General Points of Information

Santa Clara Valley Transportation Authority
VTA is the acronym for Santa Clara Valley Transportation Authority, not Santa Clara Valley Transit Authority as is listed on page 1-2. **22-1**

VTP 2020
Page 3.3-4 notes that VTP 2020 is still in draft form. In fact, the VTA Board of Directors adopted VTP 2020 on October 5, 2000. The VTP 2020 final report was published in December 2000. **22-2**

Transportation Impact Analysis Issues

Transportation Demand Model
Page 3.3-35 mentions that the "model forecasts originally reviewed in this analysis were produced in late 1999 for other projects, and data from forecasts produced in early 2001...." Please include in the Traffic Appendix documentation of the specific network and land use assumptions for the model runs used in the analysis. **22-3**

Transportation Demand Management (TDM) Trip Reductions

The VTA *Transportation Impact Analysis (TIA) Guidelines* state that all vehicle trip reductions must be clearly explained, documented and justified in the project's TIA report." VTA recognizes two TDM trip reduction values based on the effectiveness of different types of TDM programs: financial incentives and shuttle programs. The maximum trip reduction for TDM programs based on financial incentives is five percent. The maximum trip reduction for shuttle programs providing links to major transit centers is three percent.

The DEIS discusses the implementation of an "aggressive TDM program designed to reduce trip generation by a total of at least 22 percent. In addition, on-site housing would also help to reduce vehicle trip generation to external streets and freeways by internalizing trips to on-site employment centers and amenities." **22-4**

Page 3.3-33 states that the "existing TDM programs result in an estimated 21 percent reduction in the number of single-occupant vehicle trips generated by the NASA-controlled portion of Ames Research Center relative to the typical number of single-occupant trips that would otherwise be expected from a similar number of employees in Santa Clara County." Is this the basis for the 22 percent TDM reduction used in the analysis? If so, please provide the calculation sheets for determining the 21 percent reduction in the Traffic Appendix.

Also, the footnote on Tables 4.3-2 to 4.3-5 mentions that the "TDM reduction for the NRP area may appear to be higher than 22 percent; however, this is caused by the increased on-site housing reduction provided by the already approved uses in the NASA Research Park under the CUP." How are the TDM trip reductions calculated in these instances? For example, how was the TDM Trip Reduction of 3,872 (about 30 percent of 12,948) determined for a NRP Total after reducing for on-site housing of 12,948? What is the basis of this reduction? **22-5**

Summarizing the total gross daily trips and total net daily trips for Alternatives 2 through 5 reveals the following:

Alternative	Total Gross Daily Trips	Total Net Daily Trips	Total Reduction
2	33,494	22,445	33%
3	24,373	15,895	35%
4	41,115	27,580	33%
5	26,763	14,366	46%

22-6

Please explain why Alternative 5 has a higher total reduction than the other alternatives. 22-6

Mathilda Avenue/SR 237 Interchange Analysis

What was the purpose of conducting the CORSIM analysis presented on pages 4.3-20 to 4.3-22? The TRAFFIX-based results on Tables 4.3-6 through 4.3-9 already show LOS F conditions for this interchange. The CORSIM analysis summary does not really provide any new information. 22-7

Page 4.3-22 states that "the interchange is projected to be over-saturated by 2013 regardless of project implementation unless additional capacity on SR 237 is provided or future traffic demand in the Moffett Park area of Sunnyvale is limited. Thus, the CORSIM analysis could not be used to accurately quantify project impacts at the Mathilda Avenue/SR 237 interchange." Please explain this text. 22-8

Baseline Conditions

Table 2-1 shows 5,326,563 square feet of existing facilities at the project site. Does this represent existing facilities that are occupied today or the total space both occupied and unoccupied? If only part of the space is occupied today, what percentage of the 5,326,563 square feet of space is occupied? If only part of the space is occupied today, how have the trips from the unoccupied portion been accounted for in the baseline and project alternatives analysis? 22-9

The discussion for Alternative 1 on page 2-30 gives the impression that much of the space shown in Table 2-1 as existing facilities is actually unconstructed, but approved facilities that should perhaps be accounted for in a "background" scenario. Page 2-30 states that for Alternative 1 "the NRP area would have buildings totaling...2 million square feet... the Eastside/Airfield area would have...1.1 million square feet...the Ames Campus area would have...2.9 million square feet...." The trip generation calculation sheet in the Traffic Appendix for Alternative 1 shows new trips for 90,000 square feet of low density R&D, 600,000 square feet of high density R&D, 113,000 square feet for other uses and a child care facility and removal of trips associated with a motel. Please clarify and/or make modifications as necessary. 22-10

Bicycle Related Issues

Ellis/101 Interchange Improvements

VTA is pleased to note that Mitigation Measure CIR-6 will reconfigure the Ellis Street lanes under 101 to improve safety for through cyclists. Please ensure that there will be 22-11

(1) at least 5 feet width for the bike lanes, (2) clear signage and (3) sufficient lighting as part of this mitigation measure, in order to maintain safety for bicyclists and automobiles. 22-11

Bay Trail

VTA strongly urges NASA to implement the Bay Trail segment in the NRP in coordination with ABAG. The proposed NRP segment would close a major gap in Santa Clara Cross County Bicycle Corridor # 11, which extends from Milpitas to Palo Alto along the Bay Trail. 22-12

Bicycle Facilities

VTA is has reviewed the *NASA Research Park Design Guide* (Final Draft, June 2001) and strongly encourages NRP to be developed according to the *Design Guide.* VTA is pleased to note that bicycle lanes are proposed for most of the street network, and that bicycle parking will be installed throughout the NRP. 22-13 VTA recommends that bike lanes also be installed on Wescoat Road: right-of-way could be taken from the university-side setback. 22-14 Please ensure that way-finding signage geared towards cyclists will also be provided. Please also ensure that any drainage grates used are bicycle-friendly, in conformance with Caltrans standards. 22-15

Bicycle parking should also be provided at or near the NASA LRT station in order to encourage transit use. 22-16

Transit Related Issues

Transportation Demand Management (TDM) Program

As a mitigation measure for traffic and air quality impacts of the project, a TDM program is proposed. VTA commends NASA for their approach in developing an aggressive TDM program with the potential to substantially reduce vehicle trips. 22-17

Transit Center Parking Structure

There was no mention of a 2,000 space parking structure adjacent to the VTA NASA Bayshore Light Rail Station in the Draft EIS. VTA would welcome discussion on this proposed project, since it may have a huge impact on VTA operations. 22-18

Transportation Management Association

The Transportation Management Association (TMA) should also include VTA and other transportation service providers as partners, in order to coordinate and implement the TDM program more effectively. To what entity will the NRP TMA be responsible? This is 22-19

significant, since the TMA is the proposed owner/developer of the 2,000 space parking structure by the NASA Bayshore Light Rail Station at parcel 10-11, as well as the administrator for all parking revenues. **22-19**

Shuttle Service

VTA requests that a representative from VTA Service Planning be included in discussions concerning expansion of shuttle service in order to ensure that there is not duplication of VTA bus service and so that VTA can modify existing bus service to better link with shuttle service. **22-20**

In general, we recommend that shuttle stops should be located approximately 1/8 mile from building entrances, rather than ¼ mile, in order to be considered 'front-door service'. It takes approximately 7-8 minutes to cover a ¼ mile and less than 5 minutes to cover 1/8 mile. Although VTA uses ¼ mile to determine service coverage, the NRP shuttle will serve a relatively small, dense development relative to VTA's entire service area. **22-21**

Will the proposed shuttle service run at 10 minute headways throughout the day, or will there be differences in frequency between the peak and off-peak hours? **22-22** Is our assumption correct that the TMA will fully fund the proposed shuttles? **22-23**

Drainage Patterns

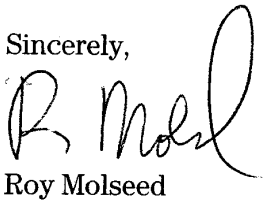
It should be noted that as a result of construction of the Tasman West LRT project, drainage patterns in the area of the project site have been altered somewhat. VTA is working with Caltrans to initiate a study of the drainage patterns, including runoff to Moffett Field. This effort should be considered as part of the Master Plan study. **22-24**

Bus Service

As specific development proposals are developed, we recommend that existing bus stops be improved to meet VTA standards, including provisions for bus pads, bus duckouts, and Americans with Disability Act (ADA) standard passenger waiting areas, as appropriate. We also recommend that all lighting posts be located at least 2 feet away from the curb in order to minimize the potential for conflict with buses. In addition, we **22-25**

request the opportunity to review proposed development plans in order to make recommendations concerning future bus stop improvements. 22-26

Sincerely,



Roy Molseed
Senior Environmental Planner

RM:kh

cc: Chester Fung, Congestion Management Program
Jim Lightbody, Planning and Programming

LETTER 22

Roy Molseed, Senior Environmental Planner, Santa Clara Valley Transportation Authority, January 28, 2002.

22-1: The amendment requested by the commentor has been incorporated on page 1-2 of this Final Programmatic EIS.

22-2: The amendment requested by the commentor has been incorporated on page 3.3-4 of this Final Programmatic EIS.

22-3: The loaded transportation demand model networks were provided to Fehr & Peers Associates, Inc. by Valley Transportation Authority staff. The loaded network files originally used to estimate the annual growth factor were dated September 1999. No list of improvements included in the network files was provided.

In response to this comment, a more recent version of the forecast Year 2025 model, dated December 2001, was reviewed to determine if the growth factor should be modified. This analysis found that the annual growth factor of one percent used in the DPEIS and applied to the period from September 1999 to December 2001 was sufficient to account for changes in traffic on the 16 street segments within the study area.

22-4: Please see the response to Comment 21-6.

22-5: Please see the response to Comment 10-5.

22-6: The total trip reduction is based on the amount of on-site employment/students, on-site housing, and TDM measures. Because the traffic analysis consistently estimates that the TDM program would reduce vehicle trips 22 percent under all of the build alternatives, the variation in total trip reduction is based on the comparative employment and housing levels. Alternative 5 includes

the highest number of total dwelling units (1,040) and also lower employment/student levels than most of the other alternatives. This results in the highest total trip reduction. Mitigated Alternative 5 now has 1,930 dwelling units and a 55 percent total trip reduction.

22-7: The CORSIM analysis was used to better quantify traffic operations at the four closely-spaced and interconnected intersections at the Mathilda Avenue/Highway 237 interchange. The TRAFFIX software package only analyzes intersections independent of effects from adjacent intersections (i.e. queues from an adjacent intersection are not accounted for). The CORSIM analysis was used to more accurately represent interconnected signal phases and lane utilization in this area.

22-8: The purpose of using CORSIM for this analysis is described in response to Comment 22-7 above. Intersection impacts are typically defined based on criteria using changes to peak hour operations. Since substantial oversaturation of the study intersections and peak-spreading is expected, changes to delays and critical volume-to-capacity ratios could not be accurately calculated. Thus, impacts at this location could not be quantified using CORSIM, so the TRAFFIX analysis applied to all other study intersections was used.

22-9: The 490,000 square meters (5.3 million square feet) of existing facilities shown in Table 2-1 includes both occupied and unoccupied facilities. Almost all unoccupied facilities are assumed to be demolished under the NADP, so it is not necessary to account for new trips related to reuse of these unoccupied facilities. Where an unoccupied facility is proposed for reuse under the NADP (as is the case, for example, with Hangar 1), this new use is specifically called out in Chapter 2 and accounted for in the traffic analysis.

22-10: The building areas listed in section C of Chapter 2 are totals for each part of the Airfield and are not new development. The anticipated new development under previously approved environmental

documents is much smaller than those numbers and was used to generate trips under Baseline or No Project conditions. The traffic associated with approved developments is included in the trip generation tables in Appendix B under Alternative 1.

22-11: This comment expresses the commentor's support for Mitigation Measure CIR-6, and suggests additional refinements to this mitigation measure. The proposed refinements have been added to the mitigation measure, as have other items. It should be noted that this mitigation measure may not be feasible, in which case the identified impact would remain significant and unavoidable.

22-12: Please see the response to Comment 14-27.

22-13: NASA will fully implement the proposed street sections and bicycle guidelines outlined in the NRP Design Guide.

22-14: The right-of-way of Wescoat Road is limited due to its original construction and the fact that it is part of the historic district. No widening of the street could occur without significant impact to the historic framework. This, however, does not preclude the street being identified as a bike route with Class III lanes that are demarked but not dedicated by a painted lane. This possibility will be further researched and considered as NADP planning progresses. It would not, however, change the results of this EIS, so no further analysis is required here.

22-15: The NRP Design Guide as well as NASA's NRP Transportation Demand Management (TDM) Program outlines guidelines for bicycle accommodation. These standards reference and are based directly on the *Bicycle Technical Guidelines: A Guide for Local Agencies in Santa Clara County*, published by the VTA. This document provides specific guidelines and details for bicycle-proof grates.

22-16: The proposed development near the light rail station would include several commuter-related services in order to encourage transit use. Among these services would be bicycle storage. In addition, the light rail station would provide integrated bike storage areas and may be combined with additional commercial functions, such as bike/car rental and newspaper stands.

22-17: This comment commends NASA for its approach in developing its TDM program. No response is required.

22-18: The TDM Program (described in Appendix B) for the NRP and Bay View, as proposed, does include the construction of parking structures to accommodate the shared parking that would be required to support the TDM goals of this project. It is estimated that 2,000 spaces could be provided in these new parking structures, and that some of this parking would be located near the light rail station. However, the exact size and location of the parking structures have not yet been determined. This level of detail would be determined by the Transportation Management Association (TMA) as it implements the TDM Program. The TMA would work with VTA, and other transit providers, on issues that affect transportation to the NRP.

22-19: The TMA would be composed of the NRP partners who locate on the site. Since the TMA would be charged with administering funds paid by these entities, its membership would be limited to these entities. However, the TMA will establish a working relationship with VTA, who can participate in an advisory role.

The TMA would be responsible to NASA and its partners in the NRP.

22-20: As stated in section 4.2.12 of Appendix B of the DPEIS, the TMA would work with VTA and other transit providers to improve bus service to the research park. This would include discussion of how to

best coordinate shuttle service in order to optimize the overall transportation support to the new development.

22-21: When distances between origins and destinations are as short as they are at the NRP (0.6 kilometers [0.4 miles] from the light rail station to the heart of the campus parcels), shuttles must be very frequent to provide effective service. A potential rider will not wait ten minutes for a trip that would take two minutes in a car or seven minutes to walk. Thus it would be extremely difficult to increase route coverage and maintain such high frequencies in a cost-effective manner. The conceptual design for weekday shuttle service provides five minute frequencies through the heart of the NRP and provides stops within 0.4 kilometers (¼ of a mile) of all the key destinations within the park. The shuttle would travel up McCord Avenue. The farthest "front-doors" would be those along Cody Road, specifically the museum sites. To provide service along both Cody Road and along McCord Avenue would either dilute the frequencies of the system to the point that the system would be much less attractive to the majority of riders or would increase costs significantly.

22-22: As explained in the TDM Program in Appendix B of this EIS, shuttle service in Phase 1 (before there is housing in the Bay View) would run on 20-minute headways throughout the day. In Phase 2, shuttles would run on 15-minute headways from Bay View and from the Transit Green, providing 7.5 minute headways in the core of the NRP throughout the day. In Phase 3 & 4, the shuttle frequencies would increase to 10 minutes at either end, providing five minute headways internal to the NRP. These headways could be adjusted by the TMA as long as AVR goals are met.

The shuttle routes would vary in the amount of service they would provide during the day – as little as 6 hours per day for the ACE Train shuttle and as many as 20 hours per day for the Bay View shuttle. The only shuttle operating during the peak only (or with decreased

headways in the off-peak) would be the ACE Train shuttle. Shuttle frequencies on certain routes would also decrease on weekends, holidays and summers.

22-23: The TMA would fund the proposed shuttles in support of the NRP and Bay View development.

22-24: As described in the response to Comment 10-11, the discharge into Drainage Area 6 (as delineated in the EIS) would not impact the improvements proposed under the NADP since that area would not be developed. The discharge to the area west of the airfield, which would be developed under the NADP, has been estimated and included in the design of the revised drainage system presented in the Final Programmatic EIS. Once the final disposition of the Highway 101 bubble-ups has been determined (as a result of the modifications of the drainage system along Highway 101 by the VTA), the actual conditions would be incorporated into the schematic design of the Ames Research Center storm drain system.

22-25: As new roads are constructed, existing bus stops would be replaced or remodeled to comply with current VTA standards regarding bus stop configuration, duckouts, pavements, as well as meeting ADA accessibility standards.

22-26: Any future proposed bus stops would be coordinated with the VTA planning department to ensure compliance with VTA standards.

STATE OF CALIFORNIA GRAY DAVIS, *Governor*

SAN FRANCISCO BAY CONSERVATION AND DEVELOPMENT COMMISSION
50 CALIFORNIA STREET, SUITE 2600
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February 8, 2002

Ms. Sandy Olliges
Environmental Services Office
NASA Ames Research Center
Mail Stop 218-1
Moffett Field, California 94035-1000

SUBJECT: Comments on Draft EIS for NASA Ames Development Plan

Dear Ms. Olliges:

Thank you for the opportunity to review and comment on the *Draft Programmatic EIS, NASA Ames Development Plan* (EIS) dated November 2001. Although our Commission has not had the opportunity to review the document and these are, therefore, staff comments, they are based on the Commission's law, the McAteer-Petris Act (California Government Code Section 66600-66682), *San Francisco Bay Plan* (Bay Plan) and the Commission's federally-approved coastal management program for the San Francisco Bay segment of California's coastal zone (management program). Our comments focus on the need to: (1) describe the Commission's authority and policies in the Public Policies section of the EIS and analyze and discuss the possible conflicts between the proposed project and the Commission's policies designating Moffett Field as an airport priority use area; (2) provide a full discussion of federal consistency process under the Coastal Zone Management Act, the requirement of a consistency determination for the proposed project, and the possible inconsistency of the proposed project with the Commission's management program; and (3) analyze the cumulative traffic impacts of the proposed project on regional transportation services. **23-1**

The Commission's Jurisdiction. Under the McAteer-Petris Act, the Commission has authority over San Francisco Bay, including all sloughs, to mean high tide, marshlands lying between mean high tide and five feet above mean sea level, and submerged lands lying below Mean Low Tide, and over certain named waterways tributary to the Bay that are subject to tidal action. (Govt. Code Sec. 66610(a) and (e).) The Commission also has authority over salt ponds (areas that have been diked off from the Bay for the purpose of producing salt through solar evaporation) and managed wetlands (areas that have been diked off from the Bay and maintained as a duck hunting reserve or wildlife refuge). (Govt. Code Sec. 66610(c) and (d).) In addition, the Commission has authority over a shoreline band consisting of land 100 feet inland from and parallel to San Francisco Bay. (Govt. Code Sec. 66610(b)).

San Francisco Bay Plan. The Bay Plan contains the Commission's enforceable policies and designates on Plan Maps the shoreline areas that are reserved for regional high priority uses such as water-oriented recreation, seaports and airports. The Commission may issue permits for proposed projects in priority use areas if the use is consistent with the designated priority use as well as the other provisions of the McAteer-Petris Act and the Bay Plan. Portions of many priority use areas lie outside the Commission's 100-foot shoreline band jurisdiction and the Commission's authority in these areas is advisory only, except in cases where federal consistency applies as discussed below. **23-2**

Bay Plan Map 7 designates Moffett Field as an airport priority use area and the Plan Map policy note regarding Moffett Field states "Moffett Naval Air Station – If and when not needed by the Navy, site should be evaluated for commercial airport by regional airport system study. (Moffett NAS not within BCDC permit jurisdiction.)"

As discussed below in the Federal Consistency Authority section, the EIS must discuss the Bay Plan priority use designation and Plan Map policy note and analyze what appears to be an inconsistency between the proposed project alternatives 2 through 5 and the Bay Plan. In addition, the EIS should discuss the consistency of the proposed alternatives with the *Regional Airport Systems Plan* prepared in 2000 by the joint Metropolitan Transportation Commission's, Association of Bay Area Governments' and San Francisco Bay Conservation and Development Commission's Regional Airport Planning Committee. It does not appear to us that considerable development of new high human occupancy uses immediately adjacent to and surrounding the existing airplane landing and takeoff runways is compatible with existing or possible future use of Moffett Field as an airport. 23-2 23-3

The Commission's Permit Authority. Pursuant to the McAteer-Petris Act, any person or local or state governmental agency wishing to place fill, to extract materials, or to make any substantial change in use of any water, land or structure within the Commission's jurisdiction requires a Commission permit. (Govt. Code Sec. 66632(a)). The Commission must issue a permit for a proposed project if the Commission finds that the project is consistent with the McAteer-Petris Act and the provisions of the Bay Plan or is necessary to the health, safety or welfare of the public in the entire Bay Area. (Govt. Code Sec. 66632 (f).) To the extent that any of the work proposed in the project alternatives is within the Commission's permit jurisdiction, the EIS should describe that work and discuss the compatibility of the project with the McAteer- Petris Act and the provisions of the Bay Plan. 23-4

The Commission's Federal Consistency Authority. In 1977 the Department of Commerce approved the Commission's management program for the San Francisco Bay segment of the California coastal zone. The Commission's management program generally consists of the McAteer-Petris Act, Bay Plan, special area plans, and the Commission's regulations. Generally, the San Francisco Bay segment of the state's coastal zone includes the Commission's McAteer-Petris Act jurisdiction and the shoreline priority use areas that extend inland beyond 100 feet of the Bay that the Commission has determined directly affects the coastal zone. Under the Coastal Zone Management Act, any federal activity that directly affects land or water uses within the coastal zone or federal development project located within the coastal zone must be consistent to the maximum extent practicable with the Commission's coastal management program. Any project that affects land or water ruses located within the coastal zone that requires a federal permit or other approval, or is supported by federal financial assistance, must be fully consistent with the Commission's coastal management program. 23-5

The EIS briefly discusses the Coastal Zone Management Act and correctly identifies that "federal actions must be consistent with state coastal zone management programs." (p. 5.5-10) However, one could conclude from the discussion that the proposed project must be consistent with the California Coastal Act and Local Coastal Plans as well as the Bay Plan. The EIS should make clear that only the Commission's coastal zone management program applies to San Francisco Bay and that the Commission's management program, as discussed above, is not limited to the Bay Plan as is inferred in the EIS. 23-6

The EIS states that "[m]ost of the area proposed for development under the NADP is outside the jurisdiction of BCDC." This is true for the Commission's permit jurisdiction under the McAteer-Petris Act, but not true for "consistency" purposes under the Coastal Zone Management Act. All of Moffett Field is subject to the Commission's coastal management program authority because Moffett Field is either in or directly affects the coastal zone. Because consistency determination for the NASA Ames development project will be required under the Coastal Zone Management Act, the EIS should include an analysis of the consistency of the proposed project alternatives with the Commission's coastal management program, specifically the designation of Moffett Field as an airport priority use area. As previously mentioned, it is 23-7

difficult to see how the development of up to 2.1 million square feet of new educational, office, research and development, museum, conference center, housing and retail uses immediately adjacent to and surrounding the runways at Moffett Field are conducive to airport use of the facility. This analysis should be included in the Final EIS

23-7

Additional Traffic on Route 101. In 1984 the Commission and the Metropolitan Transportation Commission completed a joint study of the cumulative regional traffic impacts from new and proposed development along Highway Route 101 on the San Francisco Peninsula and concluded that any additional traffic would result in worsening of congestion on the freeway, its interchanges and access to the local street system. As the freeway becomes more congested, drivers will seek out alternative routes on local arterials and streets and there will be considerable pressure to widen Highway 101 or possibly construct an alternative roadway system bayward of the freeway, possibly on fill in the Bay. The EIS should analyze the availability and capacity of regional transportation facilities, including mass transit, to accommodate transportation trips generated by the proposed project and propose appropriate traffic mitigation measures to relieve pressure for construction of future roadways, possible on Bay fill.

23-8

We hope these comments have been helpful in NASA Ames Research Center's development of a Final EIS for the proposed project for consistency with the Commission's management program for San Francisco Bay.

Regards

JEFFRY S. BLANCHFIELD
Chief Planner

JSB/gg

cc: Regional Airport Planning Committee

LETTER 23

Jeffry Blanchfield, Chief Planner, San Francisco Bay Conservation and Development Commission, February 8, 2002.

23-1: This comment is an introductory comment that provides background information about BCDC's jurisdiction under the McAteer-Petris Act and the assignment of Moffett Field as an airport priority use area under the San Francisco Bay Plan. Introductory comments are addressed in more detail in responses to Comments 23-2 through 23-8 below. Paragraphs 2, 3 and 7 of the commentor's letter have been added to pages 6.5-10 and 6.5-11 to better describe the commission's laws and policies.

23-2: A description of the cited Bay Plan has been added to Section 3.1.H of this Final EIS. An analysis of the alternatives' consistency with this plan has been added to Appendix A. Please refer also to responses to Comment 16-13.

23-3: A description of the cited Regional Airport System Plan has been added to Section 3.1.I of this Final EIS. An analysis of the alternatives' consistency with this plan has been added to Appendix A.

23-4: None of the work proposed under the NADP is within the permit jurisdiction of the Bay Conservation and Development Commission.

23-5: This comment describes BCDC's Federal Consistency Authority and states that any project that affects land or water within the coastal zone that requires a federal permit or other approval, or is supported by federal financial assistance, must be fully consistent with BCDC's coastal management program. Additional information on this topic has been added to pages 6.5-10 and 6.5-11 of this Final Programmatic EIS.

23-6: Please see the response to Comment 23-5.

23-7: An analysis of the compatibility with the physical and operational use of the airfield has been added to Section 4.2 of this Final EIS. In addition, an analysis of the NADP's consistency with the BCDC Bay Plan is included in Appendix A. This fulfills the commentor's request to consider the alternatives' consistency with BCDC's coastal zone management authority, specifically the designation of Moffett Field as an airport priority use area.

23-8: Comments regarding congestion on Highway 101 and potential diversion to other facilities are noted. The TDM program proposed as part of the project includes measures to maximize use of available mass transit systems including Caltrain, VTA light rail, and the ACE and Capitol passenger rail corridors serving the east and south bay areas. Transit subsidies, extensive shuttle service, limited on-site parking supplies, parking charges, and housing for on-site employees would all serve to minimize the need for future roadways. More detail on the TDM plan can be found in Appendix B. The ability of regional transportation facilities (freeways and transit) to accommodate project-generated trips is quantified on pages 4.3-28 through -31 of the FPEIS.

January 22, 2002

Ms. Sandy Olliges
M/S 218-1
NASA
Ames Research Center
Moffett Field, CA 94035

Subject: Silicon Valley Toxics Coalition Comments on the Draft Environmental Impact Statement: NASA Ames Development Plan

Dear Sandy:

Enclosed are my comments, on behalf of the Silicon Valley Toxics Coalition that address NASA's Draft Environmental Impact Statement. Please note that I serve as Technical Advisor to the Silicon Valley Toxics Coalition (SVTC), recipient of a Technical Assistance Grant from the U.S. EPA.

These comments are sent by e-mail to ensure that they arrive in time; they will also be mailed on my letterhead

Yours very truly,

Peter M. Strauss

cc: Ted Smith
Michael Stanley-Jones
Lenny Siegel
Andrea Muckerman, U.S. Navy
Alana Lee, US EPA
Adriana Constantinescu, RWQCB

1) Members of the community feel that housing opportunities should be maximized, wherever possible. With the exception of a few areas, the Navy had agreed to clean up soil and groundwater at Moffett Federal Airfield (MFA) to residential standards. MEW cleanup standards for groundwater were also set at MCLs or lower, eventually meeting residential standards. While SVTC does not support building housing over the most contaminated parts of the regional plume, we believe that it is important to leave this option open as the concentrations begin to approach a level where it will not harm occupants of residences. As such, we recommend that the DEIS contain information concerning the following: 24-1

- When it is anticipated that high concentration zones of the Regional Plume will be remedied so that residential development could take place?
- Is it possible to add extraction wells to the regional design that would increase the rate of cleanup?
- Are there engineering options for buildings that could be put in place while cleanup is occurring so that threats to human receptors would be minimized? Please provide details.

2) With respect to the residential development proposed in Alternative 5, located in the Bay View parcel, it is not clear that this parcel has been adequately characterized. Additionally, there is some contradictory information in recent reports, and there is no information in the DEIS that supports the assumption that the Regional Plume will not spread to the area designated for housing.

Characterization. The area proposed for housing is immediately south of the Western Diked Marsh. It has no monitoring points, except one Santa Clara Valley Water District Well (First Annual Groundwater Report for EATS and WATS, Figure 2-5, Basewide and MEW Well Locations, 6/29/01). NASA or the Navy could have contaminated the area, regardless of the spread of the Regional Plume. Some contaminated areas are close enough to the site of proposed housing that the risk of contamination needs further investigation. For example Area of Investigation (AOI) 8, called the Navarro Farm, is located northwest of the Bay View Parcel. It was known to store pesticides, chlorinated solvents and waste oil. There was a reported oil spill in 1987, and petrol-diesel was found at 10,000 ppm in soil (cleanup level is 400 ppm). For groundwater, petrol-diesel was found at 1,200 ppb (cleanup level is 700 ppb). Additionally, running through the middle/east-side of the Bay View parcel is the Lindberg Ave. Storm Drain Channel (AOI 6) which was contaminated with PCBs. It collected runoff from NASA and the western MFA. The area had PCBs above eco-cleanup levels and has been excavated. Additionally the Western Diked Marsh is just to the North of the area proposed for residential development. Historically, the marsh was sprayed with DDT, and has levels of lead above normal. 24-2

Given the type of contamination that has been detected at MFA and NASA, prior to any residential construction, we recommend that soil and shallow groundwater be tested for PCBs, pesticides, Total Petroleum Hydrocarbons, volatile organic compounds (VOCs) and heavy metals.

Contradicting Information. The boundary of the Regional Plume should be well defined. Figure 3.7-1 of the DEIS indicates that the Regional Plume has crossed into the Bay View parcel, but only a few spots west of Lindberg Avenue appear to have detections greater than 1 ppb. However, Figure 2-2 of the Phase 1 Assessment for Orion Park and Westcoat, indicates that the plume crosses Lindberg Avenue, stopping just short of 254 (See Figure 1-6 of DEIS to locate 254). Please reconcile or correct this information. 24-3

Spread of the Regional Plume. While the regional extraction system is operational, it is assumed that the Regional Plume will not spread to the Alternative 5 proposed housing area. MEW and NASA have regional extraction wells to the south and west of the areas designated for housing. However, if the regional extraction system is altered, the possibility that the regional plume may spread to this area increase. For example, if the Navy decides to close down its regional extraction wells, how will that affect NASA's/MEW's capability to control the distal edge of the plume. Please provide information which indicate firm commitments on the part of NASA and MEW to continue pumping of the regional extraction system and provide detailed information that provides assurance that the Regional Plume will not contaminate this area. Is it possible for NASA to make this commitment when the Navy has not signed the agreement allocating responsibility for areas of contamination (see below)? 24-4

3) The Navy has not signed the "carve out" agreement (Allocation and Settlement Agreement for MEW Remedial Program Management between the United States Department of the Navy and Fairchild Semiconductor Corporation, Raytheon Company and Intel Corporation, transmitted to the Navy February 25, 2000) delineating responsibility for cleaning up groundwater among parties. NASA and MEW did sign. Under the proposed carve out agreement, the Navy would be responsible for a groundwater cleanup from under Hanger 1 to McCord Avenue, a large part of the NASA Research Park parcel. SVTC calls on all parties to sign a comprehensive allocation agreement. We believe that it is necessary prior to any new construction at Moffett. SVTC is concerned that any contamination discovered during construction would trigger a dispute about whose responsibility it is to remediate it. 24-5

4) In 1988, MEW concluded that there were no risks in the parcel for the NRP, given existing land uses. This assessment did not include the effects of indoor air. It noted that "redevelopment of the site could lead to exposure of contaminants present in subsurface soils" assuming no remediation was done on the site. A document called "Administrative Draft, Human Health Risk Assessment, NASA Research Park", November 26, 2001 was designed to specifically address the issue of air contamination and its effects on health following construction at NASA Research Park (NRP). This study should be integrated into the Final EIS. 24-6

Risks were calculated using groundwater data, surface flux measurements, and air quality data. Under a reasonable maximum exposure model, every group except visitors (indoor workers, construction workers, maintenance workers, students, adult residents, child residents, and children at child care) would be exposed so that excess cancer rates are greater than 10 to the minus 6 (10^{-6}, or one additional cancer per one million people). Under a model called central tendency estimate, indoor air, student, adult resident, and

child residents are greater than 10^{-6}. These are in specific locations in the proposed Research Park, so theoretically, one could choose to build or not build, or delay until further cleanup at specific locations.

A document entitled "Draft Final Environmental Issues Management Plan" dated 12/01, was prepared for the manager of the DEIS for NASA. It states NASA's goal is to achieve "an estimated lifetime excess cancer risk of less than 1×10^{-5} and HI of less than 1 for indoor workers, construction workers, outdoor maintenance workers and students. For adult residents, child residents, and children in daycare, NASA's goal is to achieve an estimated lifetime excess cancer risk of less than 1×10^{-6} and HI of less than 1."

This document lays out some of the risk management design considerations for new construction. These include measures to address VOC intrusion, measures to reduce contact with residual chemicals in the soil, reducing potential lateral migration of VOCs in utility corridors, reducing potential for creating conduits to deeper groundwater zones, removal or relocation/replacement of existing monitoring wells and remediation system pipelines. **24-6**

SVTC believes that exposing people to cancer risks greater than 10^{-6} is unacceptable, and every effort should be made to decrease this risk to a de minimus level. This includes relocating new buildings, adding additional extraction wells to speed up the remedy, and providing engineering controls that mitigate some of the exposure. This document should be included as an appendix to the DEIS, as it contains valuable information.

5) If the proposed plan is approved and commercial/academic buildings are constructed at NRP, SVTC does not want the Navy, NASA or MEW to relax its standards for cleanup. In other words, because a land-use is selected that does not require meeting residential cleanup goals, SVTC does not believe that this justifies adopting a less restrictive clean-up policy. SVTC is cognizant that land-uses change with time; we are also very aware of the housing shortage in Santa Clara Valley. Therefore we strongly urge that clean-up policy not be dictated by temporal land-use. **24-7**

LETTER 24

Peter M. Strauss, Technical Advisor, Silicon Valley Toxics Coalition, January 22, 2002.

24-1: NASA is taking the necessary steps to ensure that housing provided under the NADP does not create exposures that could be harmful to human health. Remediation of the high concentration zones of the Regional Plume is already underway, and is expected to be complete sometime in the next 20 to 100 years, as stated in the MEW and Navy clean-up documents. NASA does not have any more detailed schedule information than is available in the clean-up documents. Adding more wells to speed clean-up is not within the scope of the NADP project, since the remediation is not under NASA's administration. It would be up to the MEW companies and the Navy in consultation with the regulatory agencies to consider such an idea.

In order to evaluate the risks involved in placing housing over the high concentration zones of the plume, NASA is completing a *Human Health Risk Assessment* (HHRA). Based on the levels of risk found in the HHRA, NASA is developing an *Environmental Issues Management Plan* (EIMP) that provides engineering recommendations for building over contaminated portions of the plume. NASA is not completely confident that the proposed measures would be effective for residential uses over highly contaminated areas, and so no housing has been proposed there.

However, as the remediation proceeds, NASA would consider building additional housing in appropriate areas of the NRP, for example, as residential units over the retail shops.

24-2: In addition to what was described in the response to Comment 21-42, NASA has conducted soil sampling for PCBs, pesticides, and metals in the Bay View, and is in the process of preparing an Draft HHRA for the Bay View based on the results of that sampling. The Draft HHRA

should be available for public review in Fall 2002. The soil was not tested for VOCs or Total Petroleum Hydrocarbons because there were no suspected sources; former land uses in the Bay View area were agricultural.

A0I-8 is northwest of the Western Diked Marsh (WDM). It is far removed and down gradient of the location proposed for residential use in the Bay View area. A0I-6 is east of the Eastern Diked Marsh and the Bay View Burrowing Owl Preserve. It is far removed and cross-to down gradient of the location proposed for residential use in the Bay View Area. The Western Diked Marsh will be separated from the Bay View residential area by a security fence. The USFWD has requested that the chain link fence have a small enough mesh to prevent rats from crossing from Bay View into the WDM, be buried 18 inches below ground surface and have roll-wire on the top to prevent avian predators from perching. While protecting the animals in the WDM from human population pressures, and maintaining NASA security perimeter, the fence would also keep residents in the Bay View from contacting contaminants in the WDM, AOI-8 and/or AOI-6.

24-3: Plume maps are generalized representations not meant to be definitive delineations of contamination. Both representations cited in this comment are approximate extents and are not meant to serve as detailed technical delineations of the extent of the plume.

24-4: The NRP developers would mitigate any risks to the residential areas as described in the Draft EIMP.

24-5: It is NASA's understanding that the Navy intends to remediate the area allocated to it in the "carve out" agreement. Contamination discovered during construction would be managed as described in the Draft EIMP, which includes in its Appendix an agreement to be signed by NASA and Navy whereby the Navy agrees to remediate their contaminated sites.

24-6: NASA will make every effort to reduce the risk to all occupants to below 10^{-6}, through measures described in the Draft EIMP. The Draft HHRA and Draft EIMP will be distributed to all NRP developers, and will be available to the public when they are complete in the fall of 2002.

24-7: The cleanup standards for the MEW site are established in the MEW Record of Decision (ROD),which requires cleanup of the groundwater to drinking water standards. NASA's proposed development would not affect the MEW ROD cleanup standards. Navy cleanup standards for the chlorinated solvent contamination in the NRP area are also set in the MEW ROD, and would also remain unchanged. Navy cleanup standards for its petroleum sites are set in the cleanup process with the State Regional Water Quality Control Board (RWQCB). Currently, the RWQCB has agreed with the Navy to use industrial standards at underground storage tank sites, because they are usually relatively small areas with limited access. This cleanup process was established prior to NASA's proposed development.

1691 Yale Drive,
Mountain View,
CA 94040
January 23, 2002

Sandy Olliges,
NASA Ames Research Center,
Environmental Services Office,
Mail Stop 218-1
Moffett Field, CA 94035-100

Dear Ms Olliges,

We have recently had the opportunity to study the proposed Ames Development Plan (ADP.) Advocates for Affordable Housing (AAH), a volunteer group of Mountain View residents concerned with issues related to affordable housing, wish to submit their comments.

First of all, we appreciate the effort that NASA is making to use the input from the Community Advisory Committee and to solicit other public comment.

After studying the ADP, we agree that NASA has correctly identified the negative impact of the proposed development on local quality of life issues, such as traffic, air quality, and jobs-housing imbalance. Being particularly focused on housing issues, we are concerned that NASA currently plans to provide only about 25% of the new housing generated by the preferred alternative # 5. We conclude that additional mitigation is needed to address the jobs-housing imbalance.

We recommend that NASA and its partners seek ways of providing additional housing. These could include such approaches as:
— On site by using additional sites on the airfield
— On site by using innovative methods to deal with site contamination, such as techniques aimed at eliminating indoor solvent vapor concentrations
— Off site by building housing or contributing funds to adjacent communities

25-1

We have recently participated in the development of the Mountain View Housing Element for 2001-6, and are aware that housing for low and very low income families is of the highest priority. We recommend that NASA also give the highest priority to such housing, both on and off site. For example, we recommend that NASA work with the Army to privatize the Moffett Field housing, so that it provides additional housing for the demand created by the ADP.

Other issues that concern us include the environmental impact of the enormous land fill being proposed at housing sites in Moffett Field and the plans for a new airfield control tower.

25-2

We appreciate the opportunity to comment. Please address any questions to the above address or to RGHayter@aol.com.

Sincerely,

RG Hayter

Roy G. Hayter
Chair, Advocates for Affordable Housing

Cc Mayor and Members of the Mountain City Council

LETTER 25

Ray G. Hayter, Chair, Advocates for Affordable Housing, January 23, 2002.

25-1: Please see responses to Comments 14-27, 21-14 and 24-1.

25-2: This comment expresses concern over two elements of the proposed project. It does not offer specific comments on these issues, so no response beyond the analysis already contained in the EIS is required.

LEAGUE OF
WOMEN VOTERS
OF THE BAY AREA
An Inter-League Organization of the San Francisco Bay Area

Re: NASA Ames Development Plan

January 23, 2002

Ms. Sandy Olliges,
NASA/Ames Research Center, Environmental Services Office,
Mail Stop 218-1, Moffett Field, CA 94035-1000.

Dear Ms. Olliges,

The League of Women Voters of Bay Area understands that comprehensive land use planning accompanied by careful environmental assessment is essential for efficient public infrastructure, adequate housing, and environmental health. Members of the League have followed the planning process for the NASA-Moffett Field areas with interest and concern. Although we generally find infill development to be environmentally superior to more remote development, we think development of 4-6 million additional square feet on this complex site spanning 2000 acres merits more comprehensive environmental assessment. The Draft Programmatic Environmental Impact Statement for the NASA Ames Research Center of November 2001 repeatedly states that Alternative 5 is the alternative preferred by NASA but fails to provide the basis for finding it to be **environmentally** preferable. 26-1

The unavoidable significant impacts in the areas of congestion, air quality and regional jobs-housing imbalance suggest that an alternative of lesser intensity designed to minimize driving and housing deficits should be considered. 26-2 The paucity of mitigation and monitoring measures to protect the sensitive habitats of Stevens Creek, streams and channels, the wetlands and marshes, shown in Appendix E: figure 11 as well as upland foraging areas is startling given the presence of six threatened or endangered species. 26-3 The concentration of people proposed for this contaminated site also demands more explicit. 26-4 The total site offers opportunities to conserve the Bay's ecology with a connected open space system, to connect new development with pedestrian, bike and transit access and to remediate toxins, offsetting environmental impacts of some additional development. 26-5 These need to be identified with well differentiated alternatives and appropriate mitigations.

Specifically:

1. In the presentation of Project alternatives, the "No Project" alternative is actually the existing development plus already approved new development. The executive summary omits the square footage of this "no project" alternative so that it may be compared with the magnitude of the other four alternatives. 26-6 Summary Tables 0-1 and 0-2 are missing. 26-7
2. The land use plans of the alternatives are inconsistent in their color coding and labeling. "Partner Parcels" and "Adaptive Reuse" fail to communicate the mix and intensity of the various land uses proposed under each alternative. Land use coding and map colors should be consistent on maps to communicate visually. 26-8

500 St. Mary's Road, Suite 14, Lafayette, CA 94549 ●Tel.925-283-7093 ●FAX 925-283-2613

3. County policy is to increase the supply and affordability of housing units in this portion of the County in order to achieve more balanced development patterns. Numbers of jobs and housing units under each alternative should be included in the executive summary. 26-9
4. At least one alternative should satisfy County policy on providing housing for balanced development and meeting open space standards on site. 26-10
5. At least one alternative should reflect transportation system management goals by giving preference to transit, bike and pedestrian trip times and amenities. More direct access to those who arrive by transit with less interference from automotive traffic might result under an alternative retaining the historic Main Gate automotive entrance while creating a transit pedestrian spine from Ellis entrance and light rail station. 26-11
6. At least one alternative should provide an integrated open space plan with trails and appropriate buffer areas for wetlands and Stevens Creek (including Midpeninsula Regional Open Space District plans to breach linear dikes to improve habitat). Impacts of proposed Charlestown Avenue bridge should be evaluated. 26-12 26-13
7. As six endangered or threatened species are present on the NASA Ames site, the absence of any applicable Resource and Land Management Plan (Appendix E, page 11) is unacceptable. The scope of the EIS needs to consider the critical habitats immediately downstream of the areas proposed for development. A comprehensive management plan with monitoring criteria and time schedules for the salt marsh harvest mouse, California clapper rail, California least tern, Western snowy plover and California brown pelican species is an essential precursor to any increased development. 26-14
8. The preserves allocated to the burrowing owl are fragmented and appear to include only three of the 19 nests active in 2000. As additional nesting sites are to remain undeveloped, explanation of why preserves in all alternatives are so delineated is needed. Loss of upland foraging habitat requires mitigation. It does not seem that opportunities to enhance habitat and protection around the airfield have been fully explored, especially in the Air National Guard Area where a third of the pairs were found, nor that use of the airfield as overflow parking has been assessed. 26-15
9. Potential impacts of the toxic remediation in the stormwater retention ponds needs to be explicit. Will remediation be by covering over or filling these seasonal wetlands, or excavating toxic soils and making them ponds? Possible harm to steelhead and other fishes of disposing effluent from clean-up into Stevens Creek should be evaluated. 26-16
10. Impacts of runoff from new urban development proposed (oil, grease, fertilizers..).on the onsite drainage channels and offsite riparian systems when the stormwater retention ponds overflow should be considered. Runoff to Northern Channel will get to the Moffett Channel and San Francisco Bay. 26-17
11. Potential impacts of increased oil, grease, fertilizers and other urban pollutants on the riparian system when the stormwater retention ponds overflow should be considered. Maintenance and monitoring of the system should be specified. Outfalls to Stevens Creek will impact steelhead and salmon and should be assessed both as to effluent temperature as well as water quality. 26-18
12. Coordination of Moffett Airfield Clean-up Plan with the Ames Moffett Development Plan needs to be discussed in the EIS. A realistic, enforceable plan and timetable for assessment and cleanup of health concerns and hazards is needed before development is approved. Measures for providing full public information on remaining toxic exposure for persons 26-19 26-20

utilizing recreational and other areas should be described, including any health hazard for joggers who use the eastern diked marsh. 26-20

13. Potential impact of the Bay Trail on Salt Marsh Harvest Mouse and California Clapper Rail habitat should be discussed and suitable mitigations included. 26-21
14. The EIS seems to rely on nondisturbance of the underground Regional Plume with shallow foundations and limitations on building height (load). At minimum, successfully monitored examples of such plume isolation near the Bay seems essential as this EIS leaves a mitigation and monitoring for a future "Environmental Issues Management Plan." The geological assessment of load bearing capacity fails to extend to the Bay View area; assessment of all areas to be built or graded is essential. 26-22 26-23
15. Emissions of ozone precursors and carbon monoxide exceed the de minimus amounts specified in the General Conformity Rule (40 CFR 51), thus requiring a conformity determination. As automobile trips are principal components of pollution, less development and/or fine grain mixed use within walking distance of the light rail seems critical. A walking distance contour delineating the area assumed to have lower vehicular use in each alternative could aid evaluation. The generous assumption of an overall 26% reduction in daily trips and 50% in peak hour trips for Alternative 5 because of on-site housing needs explanation given that Alternative 3, with housing, is credited with half as much reduction in car trips. 26-24 26-25
16. To support intense development, transit service and trail system are vital components for establishing alternatives to vehicular travel and access to open space. As part of the support for the development, essential elements like anticipated bus routes and the Bay Trail and spurs including Stevens Creek Trail should be sited and included in the environmental assessment. 26-26
17. Potential projects of regional interest mentioned for this site on pages 2-61 and 2-64 (Olympics, Ferry Terminal, and restoration of saltponds as tidal wetlands) should have locations under discussion approximately mapped even though "Not Covered" and brief assessment of whether the proposed plan was compatible with these other projects included . (The Bay Trail and the Charleston Avenue Bridge are components of the development plan proposed and should be included in the analysis rather than listed with the "Not Covered.") 26-27

We sincerely hope that NASA Ames will pursue this Environmental Assessment with a determination to include all the information relevant to selection of an environmentally superior project and to the establishment of management plans that will ensure that it will bear public scrutiny over time proudly.

Vanya Sloan

Vanya Sloan

President

League of Women Voters
Los Altos-Mountain View

Tamra C. Hege

Tamra C. Hege

President

League of Women Voters of the Bay Area

LETTER 26

Vanya Sloan, President, League of Women Voters, Los Altos-Mountain View, and Tamra C. Hege, President, League of Women Voters of the Bay Area, January 23, 2002.

26-1: This is an introductory comment that summarizes the commentors' opinions about the proposed project. It also says that the EIS fails to provide the basis for finding Alternative 5, which was the Preferred Alternative in the DPEIS, to be environmentally preferable. Under NEPA, the Preferred Alternative is not required to be environmentally preferable compared to other alternatives. The Preferred Alternative is the alternative that the lead agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors. However, Alternative 5 is environmentally preferable because it has the fewest significant environmental impacts. Mitigated Alternative 5, the revised preferred alternative lessens these impacts even more.

26-2: Regional impacts on congestion, air quality and the jobs/housing balance would occur with or without implementation of the NADP. Alternative 5 proposes on-site housing, the intent of which would be to not only help mitigate the jobs/housing imbalance, but also to reduce traffic congestion and air pollution. See also the response to Comment 14-26. Mitigated Alternative 5 adds more housing while also reducing traffic and air quality impacts.

26-3: Surveys have documented the presence of five threatened and endangered species in the North of Bay View area, as described on page 3.9-5 of this EIS. These species are: salt marsh harvest mouse, California brown pelican, California clapper rail, California least tern, and western snowy plover. The proposed action has been designed to avoid impacts to these species and their habitats, including the protection of these areas through preservation-related land designation, the establishment of buffers, and conservation of water

volume, salinity, and quality into those habitats. No development is proposed in or near these areas. The incorporation of these protection and conservation measures into the project description eliminates the need for additional mitigation measures to protect these species and their habitats. The number of impacts and mitigation measures included in this EIS is appropriate for the level of impact of the proposed project.

26-4: This comment is incomplete, but seems to concern possible exposure of new residents and employees at Moffett Field to existing hazardous materials contamination. An analysis of this issue has been conducted in the *Draft Human Health Risk Assessment* (HHRA), which is currently being revised by NASA. NASA is also in the process of preparing an Draft HHRA focusing specifically on contamination in the Bay View area, where much of the new housing would be located.

26-5: Opportunities for habitat conservation have been embraced in the proposed NADP. For example, the project proposes habitat protection areas for burrowing owls and many acres of open space. Transit access and expansion of the on-site bicycling network would be cornerstones of the TDM program that NASA would implement under the NADP. Pedestrian connections have also been considered in the design of the NADP. The project is being designed to not interfere with on-going remediation projects discussed in Section 3.7 of the EIS.

26-6: The square footage of the "No Project Alternative" is covered on page 2-36 of the Final EIS.

26-7: Summary tables 0-1 and 0-2 were included in the DPEIS. They do not include significant impacts for Alternative 1 because Alternative 1 would have no significant impacts, as documented in the CUP EA FONSI. A printing oversight may explain any omission of these tables from a copy of the DPEIS.

26-8: All land use maps in the EIS are consistent in color and labeling. Each land use has a corresponding color that is consistent in all five alternatives. Note that the legend that corresponds to a particular map only shows those land uses that occur in that alternative.

"Adaptive Reuse" refers to the remodeling and reuse of Hangars Two and Three. As described in the DPEIS, this is described as low-density research and development, and light industrial uses. A "Partner Parcel" is an undesignated area which would be used by any variety of partners, including office, R&D, educational, retail, and parking. While the EIS does not specify the intensity of this use, the NRP Design Guide does give height, mass, and setback restrictions for these and all parcels. Moreover, the range of uses that would be carried out by the partners is described on page 2-14 of the EIS.

26-9: The amendment requested by the commentor has been incorporated into the Executive Summary of this Final Programmatic EIS in pages 0-3 through 0-5.

26-10: A new Mitigation Measure SOCIO-1b has been added to Alternative 5 to include a much larger amount of housing on-site. While it is not possible to meet the entire housing demand generated by the project on-site, this additional mitigation measure will greatly relieve housing pressure and traffic impacts that would have otherwise been generated by the project. Alternative 5, as proposed, already meets open space standards.

26-11: The NRP design includes bicycle lanes on all streets, as well as pedestrian paths and sidewalks. A pedestrian path would connect the light rail station to the campus. Requiring all vehicles to enter the campus at the main street gate would negatively impact shuttle connections from Caltrain, VTA buses running on El Camino, and downtown Mountain View.

26-12: All of the alternatives provide an integrated on-site open space plan with buffer areas around wetlands. Mitigation Measure BIO-19 has also been added in this Final EIS to provide a wider wetland buffer area of 61 meters (200 feet) in Mitigated Alternative 5.

26-13: Please see the response to Comment 21-4.

26-14: As described in the response to Comment 25-3, the five threatened and endangered species documented at Ames Research Center are located in the North of Bay View area, which would not be developed or impacted under the NADP. In addition, NASA is currently preparing an Integrated Natural Resources Plan for Ames Research Center. This plan will provide a comprehensive overview of the resources that occur on-site (including wetlands), as well as provide guidance for natural resource management at Ames Research Center. The Integrated Natural Resources Plan will serve a similar function to a Resource and Land Management Plan. The EIS considered all habitats when analyzing impacts on special-status species. None of the habitat at ARC is designated as critical habitat for threatened or endangered species.

26-15: Please see the response to Comment 21-38.

26-16: Clean-up of the stormwater retention ponds is being conducted by the Navy, not by NASA. It is described as Site 25 on page 3.7-15 of this EIS. Details of the remediation methods and evaluation of effluent from clean-up can be found in the Navy's documentation for Site 25 in the documents collection at the Mountain View Library. Further information is available at meetings of the Restoration Advisory Board, which meets regularly in Mountain View. For the schedule of Restoration Advisory Board meetings, and/or to be added to the mailing list to obtain information about the Navy's clean-up program, call Lawrence Lansdale at (619) 532-0961.

26-17: As described in the revised section 4.5 of this Final EIS, structural elements have been incorporated into the design of the backbone storm drain system to reduce off-site pollutant loading. In addition, NASA has produced a list of Best Management Practices that have been added to pages 2-27 to 2-29 to reduce pollutant loading in the stormwater runoff.

Under the Preferred Alternative, the only development that would occur within the Eastside/Airfield, the area that discharges into the Northern Channel, is the construction of the control tower that would be relocated from its current location west of the airfield. The storm drain discharge leaving Ames Research Center via the Northern Channel would not increase due to the development proposed under the NADP.

As stated in the Biological Assessment (Appendix E), Section 8.2.2.3, no changes to vegetation, wetland, or habitat area and/or structure in the Eastern and Western Diked Marshes are anticipated from the implementation of the proposed action. Swales and other water filtration mechanisms have been incorporated into the design of the storm water drainage system to maintain high water quality in the SWRP and other drainage infrastructure.

26-18: Additional analysis of pollutant loading, water quality and water temperature in Stevens Creek have been added to Section 4.5 of this Final EIS. No impacts have been found. Pollutant loading and water quality is discussed in the response to Comment 26-17. With regard to effluent temperature, there is nothing to indicate that this would be changed from the existing condition with the revised storm drain system. Furthermore, discharge to Stevens Creek would be increased minimally, and only immediately before or after the peak flow in the creek. Therefore, the small amount of discharge from the SWRP would be mixed with high flows in Stevens Creek, which would minimize any effects the effluent temperature may have.

The stormwater drainage system described in this EIS includes provisions for monitoring and maintaining current water volumes, salinity, and high water quality in the Eastern and Western Diked Marshes and SWRP. As stated in the Biological Assessment (Appendix E) section 8.2.2.3, no changes to vegetation, wetland, or habitat area and/or structure in the eastern and western diked marshes and stormwater retention pond are anticipated from the implementation of the proposed action. With the added stormwater capacity provided via the athletic fields and other storage or swale areas (as described in Section 4.5 of this Final EIS), it is likely that most, if not all of the stormwater drainage needs can be accommodated on-site. The proposed additional outflows to Stevens Creek from Bay View have been eliminated.

On April 23, 2001, the National Marine Fisheries Service (NMFS) indicated that the proposed project had no potential to affect fish species that are threatened, endangered, proposed, or candidates for listing.

26-19: Prevention of conflicts between the implementation of the NADP and on-going remediation projects at Moffett Field is discussed in the EIS on pages 4.7-1 through 4.7-2. Remediation of the Regional Plume is already underway, and is expected to be complete sometime in the next 20 to 100 years, as stated in the MEW and Navy clean-up documents. Detailed schedules for clean-up of all MEW and Navy sites, which are described in section 3.7 of the EIS, are available at the Mountain View Library. NASA does not have any more detailed schedule information than is available in these clean-up documents.

26-20: The Navy has completed a comprehensive HHRA for the wetlands areas of Moffett Field, including the Eastern and Western Diked Marshes. This HHRA determined that risks from recreation uses were less-than-significant. The Navy's HHRA is available in the documents collection of the Mountain View Library.

26-21: The Bay Trail is not proposed as part of the NADP. Impacts to salt-marsh harvest mouse and clapper rail from construction of the Bay Trail would be addressed through the environmental regulatory processes associated with the planning, design, and implementation of the Bay Trail project.

26-22: The Draft EIMP describes appropriate building techniques to limit exposure to contaminated soil and groundwater for the occupants of new buildings proposed as part of the NADP.

26-23: Preliminary studies indicate that it would be possible to construct safely the types of buildings foreseen under all proposed alternatives. Based on borings from the area north of N258, NASA has concluded that similar soils close to Bay View are adequately buildable. However, because detailed geotechnical studies have not been completed for all potential buildings sites at Ames Research Center, Mitigation Measure GEO-4 has been added to Section 4.8 of the Final Programmatic EIS. This mitigation measure would ensure that detailed geotechnical studies of all proposed building sites be conducted by NASA or its partners prior to construction and incorporates the engineering recommendations of these studies into building designs.

26-24: Walking distance is only one factor that would contribute to the effectiveness of the mixed-use development within the project site. Very frequent shuttle service to all developed areas with and without housing and an extensive bicycle facility network would also be used to greatly expand the areas where non-automobile travel is made viable and attractive. Lower vehicle use is assumed throughout the site because of the on-site amenities, on-site transportation system options, and the limited parking supply with relatively high hourly, daily and monthly charges.

26-25: Alternative 3 includes 488 total on-site residences, which is only 47 percent of the 1,040 total residences proposed under Alternative 5, and

25 percent of the 1,930 total residences proposed under Mitigated Alternative 5. The higher amount of housing accounts for a substantially higher reduction in trips.

26-26: Transit, bicycling, walking, carpooling and vanpooling are encouraged and supported by the project as evidenced by 1) the on-site facilities, 2) accommodation of shuttles and full-size VTA buses (routes to be determined), 3) connections to LRT and Caltrain, 4) connections to existing off-site bicycle facilities, 5) the Transportation Demand Management Plan, and 6) on-site housing. All of these were included in the transportation analysis.

26-27: The Charleston Avenue Bridge was included in the analysis to determine its impact on traffic patterns. It is not included in the project and is not needed as a mitigation measure, so further analysis is unwarranted.

The construction of the Bay Trail is outside the scope of this EIS and was therefore not analyzed. Please see the response to Comment 26-21.

Because the Olympic proposal, ferry terminal and saltpond restoration projects are separate projects that are in the proposal stage, it is not necessary to map them in this EIS as the commentor suggests.

Ms. Sandy Olliges,
NASA/Ames Research Center,
Environmental Services Office,
Mail Stop 218-1,
Moffett Field, CA 94035-1000

researchpark@arc.nasa.gov

January 24, 2002

Dear Ms. Olliges:

Thank you for the opportunity to comment on the proposed redevelopment plan at Moffett Federal Airfield (Moffett Field). The South Bay is critically important habitat to dozens of species of shorebirds and waterfowl that migrate up and down the Pacific Flyway. Ducks Unlimited recognizes Moffett Field as an important opportunity to restore historic South Bay wetlands, increase the amount of wintering and breeding habitat available to waterfowl and shorebirds in the South Bay, aid in recovery of wetland-dependent endangered species, and improve Bay water quality. We support restoring wetland habitats in the Mountain View/Sunnyvale area, including the Cargill salt ponds (which have been offered for sale to the USFWS), the mouth of Stevens Creek, and the Moffett Field wetlands and associated upland habitats. We believe there is great potential for restoring a landscape of seasonal and tidal marshes, riparian habitat, and native grasslands in the northern portions of Moffett Field and neighboring properties. 27-1

The *Baylands Ecosystem Habitat Goals Report* presents recommendations for the kinds, amounts, and distribution of wetlands and related habitats that are needed to sustain diverse and healthy communities of fish and wildlife resources in the San Francisco Bay Area. The Goals Report was based on an important premise:

> "There should be no additional loss of wetlands within the baylands ecosystem. Furthermore, as filled or developed areas within the baylands become available, their potential for restoration to fish and wildlife habitat should be fully considered."

We would like to see NASA embrace this philosophy in planning the future of Moffett Field. 27-2

The Goals Report recommendations for the Mountain View Area suggest providing more and wider buffers to tidal marshes, and improving management to reduce intrusion and predators (p. 129). Buffers and transitional zones are an important part of improving wetlands and protecting habitat. A buffer is defined as a transitional area next to a wetland, or Bayland in the case at Moffett. The participants in the Goals Report recommended a minimum buffer width of 300 feet in an area with flat terrain. The large open space on the Bay View parcel provides a natural buffer between the wetlands in the eastern and western diked marshes and stormwater retention ponds, and the development at the Ames Research Center.

We have concentrated our attention on NASA's Alternative #5 as it is the preferred alternative. Selection of this alternative concerns Ducks Unlimited because it ignores the potential for significant onsite wetland restoration, provides no buffer for the site's historic wetlands, and places a significant amount of fill on the Bay View parcel. 27-3

Ducks Unlimited supports the preservation of dwindling habitat along the Mountain View/Sunnyvale shoreline. Although some of the South Bay's tidal wetlands have been preserved, they are only one part of the elevational and habitat gradient that extends from grasslands through seasonal wetlands to high tidal marsh to low tidal marsh. There are only a few places in the South Bay where it will be possible to re-establish this habitat gradient, and Moffett Field is one of them. This type of restoration program would be consistent with both the *Baylands Ecosystem Habitat Goals Report* and *Restoring the Estuary,* the implementation strategy of the San Francisco Bay Joint Venture, and would help ensure that the South Bay continues to support large numbers of waterfowl, shorebirds, and other migratory birds. It is an opportunity that must not be lost. 27-4

After reviewing Alternative #5, Ducks Unlimited has three specific comments.

1) **The baylands at Moffett Field provide a significant opportunity for onsite wetland restoration that NASA is not considering.** The San Francisco Estuary has lost nearly 95 percent of its historic wetlands, and the South Bay has lost approximately 50,000 acres of tidal marsh. Restoring degraded wetlands and recreating historic wetlands will provide dramatic ecological benefits for the Estuary such as providing critical habitat for endangered species and Pacific Flyway waterfowl, improving water quality, enhancing biodiversity, and permanently protecting open space. NASA should create a redevelopment plan for Moffett Field that embraces a variety of land uses, including enhancement and restoration of both wetlands and associated grassland habitats. 27-5

2) **As a condition of approval for any development project at Moffett Field, NASA must improve management of the existing wetlands, and embrace habitat restoration opportunities.** The stormwater ponds and the Eastern and Western diked marshes all lie within the proposed boundaries for the Don Edwards National Wildlife Refuge. These ponds should be managed for improved habitat values. No matter what development proposal is pursued for Moffett Field, these historic wetlands must be remediated to levels sufficient to support tidal wetland restoration. This will allow the U.S. Fish and Wildlife Service to incorporate these lands into the refuge and conduct much needed tidal wetland restoration. The Site 25 cleanup process must not preclude such activities. 27-6

3) **Protect the Bay View parcel and incorporate it into future restoration efforts.** Development of the Bay View parcel would encroach on the existing wetlands, and decrease their value to wildlife. Historically the Bay View parcel consisted of moist grasslands that supported seasonal swales and wetlands in wet years. Seasonal wetlands provide alternative roosting sites and foraging opportunities 27-7

during high tide events (when the tidal mud flats are inundated). These extremely productive habitats can sustain large numbers of shorebirds and waterfowl, particularly during migration periods. Even in its highly disturbed current condition, the Bay View Parcel continues to provide open water habitat that supports migratory waterfowl (p. 3.9-25). Ducks Unlimited supports protecting, restoring, and enhancing these remnant habitats, and would welcome the opportunity to work in partnership with NASA to accomplish this goal. Enhancing the existing seasonal wetlands would benefit a wide variety of wildlife and also improve water quality by filtering runoff.

The Bay View parcel could provide an ideal natural buffer between urban development at Moffett Field (especially the Ames Campus to the south) and wetlands in the diked marshes and beyond. It is likely that prior to the advent of subsurface drainage and groundwater pumping, a larger portion of this area was wetland habitat. The Bay View Parcel should be restored to its historic condition, a mixture of native grassland and seasonal wetlands. This would serve to protect and enhace the habitat values of the North of Bay View wetlands area. **27-7**

Native grassland and seasonal wetlands are increasingly rare habitats in the South Bay, because they are often filled and built upon. Ducks Unlimited is restoring native grasses upslope of tidal wetlands in the North Bay, and this could readily be done at Moffett Field. These grasslands would provide nesting habitat for resident birds, foraging opportunities for the burrowing owl population, and birdwatching opportunities for the staff of Moffett Field.

Providing adequate buffer zones is listed in the *Baylands Ecosystem Habitat Goals Report* as an important goal for the Mountain View subregion. Protecting the entire parcel from development will increase species diversity and reduce human disturbance and predator intrusion. Disturbance is a major issue for migratory birds.

4) **Proposed open space buffers are biologically and hydrologically inadequate.** The proposed 30 meter open space 'buffer' strip between developed parcels and the wetlands (p. 4.9-12) is biologically inadequate. Research on waterbird behavior has indicated that birds can be disturbed by human activity up to 100 meters away. Thus 30 meters cannot be considered sufficient separation between developed areas and wetland habitat. **27-8**

Furthermore, the Draft EIS suggests that Parcel 8 (the golf course) would serve to buffer the wetlands from development (p. 4.9-12). This is not a biologically supportable statement. While they do qualify as open space, golf courses do not fulfill many of the functions of a wetlands buffer area. For example, golf course management requires use of fertilizers and herbicides that exacerbate water quality problems in wetlands. A wetlands buffer should function as a filter strip to improve water quality of overland run-off, not as a contributor to water quality problems. Thus the golf course should be considered simply a recreational **27-9**

facility, and not a part of any habitat buffer. A better plan would include a minimum of a 100 meter strip of restored native grassland to serve as a buffer between wetlands and developed areas. Such a buffer would provide nesting habitat for resident birds, as well as foraging opportunities for burrowing owls. 27-10

Ducks Unlimited is committed to protecting, restoring, and enhancing wetland and associated upland habitat in the San Francisco Estuary. As NASA Ames pursues redevelopment of Moffett Field, we believe it is crucial to recognize the habitat restoration potential of the Bay View Parcel, the stormwater ponds and the Eastern and Western diked marshes. The habitat value of all of these parcels would be negatively impacted by the proposed development activity, and we respectfully request that changes be made to the Preferred Alternative, so that the Bay View Parcel is protected, and can be incorporated into a mosaic of restored upland and wetland habitats linking Stevens Creek with the Moffett wetlands, the Cargill properties, and the Don Edwards National Wildlife Refuge. These actions will together help attain the goals specified in *Restoring the Estuary,* the implementation strategy of the San Francisco Bay Joint Venture. 27-11

Yours Sincerely,

Ryan Broddrick
Director of Conservation,
Valley/Bay CARE Initiative

LETTER 27

Ryan Broddrick, Director of Conservation, Valley/Bay CARE Initiative, January 24, 2002.

27-1: This is an introductory comment that expresses support for wetlands restoration. Wetland restoration is outside the scope of this project. It states an opinion only. No response is required.

27-2: This comment provides a description of habitat recommendations for Moffett Field presented in the Baylands Ecosystem Habitat Goals Report. Wetland restoration is outside the scope of this project. No response is required.

27-3: This comment summarizes three specific comments, numbered as 27-5 through 27-8 and answered in detail below. Wetlands restoration is outside the scope of this project. No further response is required.

27-4: This comment expresses the commentor's support for shoreline habitat preservation and provides background about wetlands at Moffett Field. No response is required.

27-5: The NADP includes the preservation of both wetlands and grasslands. NASA currently manages, and would continue to manage, its diked wetlands to provide habitat for endangered species and Pacific Flyway waterfowl, maintaining water quality through stormwater management, enhancing biodiversity, and permanently protecting open space. The proposed NADP also provides for the establishment of 33 hectares (81 acres) of burrowing owl preserves, which would permanently protect these grassland habitats. In addition, the proposed NADP maintains an additional 11 hectares (27 of acres) of grasslands in open space in the Bay View area, adjacent to the Eastern Diked Marsh and the burrowing owl preserve, as well as approximately 162 hectares (400 acres) of grasslands throughout the site. Pursuant to the proposed NADP, no wetlands would be

developed and only 11 hectares (28 acres) of grassland, or approximately 6 percent of existing undeveloped grasslands would be developed. Wetland restoration is outside the scope of this project.

27-6: The status of the SWRP, Eastern Diked Marsh and Western Diked Marsh as diked wetlands would not preclude their inclusion in the Don Edwards National Wildlife Refuge. However, NASA does not currently intend to designate its lands as part of the refuge. NASA will continue to manage these diked wetlands for storm water management and as wildlife habitat.

The Site 25 cleanup process is managed by the US Navy in accordance with its Federal Facility Agreement with US EPA and the California Regional Water Quality Control Board. Comments regarding the Site 25 cleanup process should be directed to the US Navy.

The Navy's proposed cleanup levels would not preclude tidal restoration at Moffett Field. If NASA were to decide to implement tidal restoration, it would implement any additional remediation that would be required at that time. It is possible that restoring tidal flow would actually increase contaminant levels above the Navy cleanup levels, because of the existing levels of contaminants in Stevens Creek and the South Bay. Tidal restoration is not within the scope of this project.

27-7: NASA is preparing an Integrated Natural Resources Plan that will provide a comprehensive overview of resources within Ames Research Center, as well as provide management guidelines for the future (see response to Comment 26-14). The longevity and health of existing habitats will be addressed through the planning and implementation of this document. Wetland restoration is not within the scope of this project.

The commentor states that the wetlands in the Bay View area "sustain large numbers of shorebirds and waterfowl." There is no open water habitat in the Bay View area. As stated on page 4.9-6 of the final EIS, the Bay View boundary has been redrawn to exclude any designated wetlands. No wetlands would be developed as a result of the NADP. Species that occur in the Eastern and Western Diked Marshes occasionally use the settling basin, which would not be impacted by development in the Bay View area.

Large numbers of waterfowl are found in the stormwater retention pond and other wetland areas in the North of Bay View area. The North of Bay View area would not be developed or significantly impacted as a result of the implementation of the NADP, and would therefore retain its value for wildlife.

The commentor suggests that the Bay View area should be restored to its historic condition and should be used as a larger buffer for development. This comment is noted. However, it is not the purpose nor plan of the NADP and is outside the scope of this project. The Bay View parcels are currently located in an upland area. The historical tide limit is marked by the southern boundary of the North of Bay View area.[9] Therefore, historically, the Bay View parcel was likely a mix of native grassland, upland scrub, and scattered seasonal wetlands. Because the historic tide limit occurred north of the Bay View parcel, no permanent wetlands likely occurred on the site.

Through the implementation of Mitigation Measure BIO-19, as added in this Final Programmatic EIS for Alternative 5, the buffers in the Bay View area would be increased to 61 meters (200 feet) between

[9] Goals Project. 1999. Baylands Ecosystem Habitat Goals. A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. First reprint. U.S. Environmental Protection Agency, San Francisco, Calif./S.F. Bay Regional Water Quality Control Board, Oakland, Calif.

development and wetlands, which would be adequate to protect these species from significant disturbance. Human and vehicle presence in the Bay View or North of Bay View areas do not currently preclude the presence and survival of sensitive species such as salt marsh harvest mouse and California clapper rail, and continued use of these areas is not expected to increase impacts significantly.

The commentor suggests that protecting the entire Bay View area from development would increase species diversity and reduce human disturbance and predator intrusion. As stated above, human disturbance already occurs in the Bay View area because both people and cars use the roads in this area. Species diversity is already compromised by the disturbed, ruderal nature of the site, and would be addressed and alleviated through the Integrated Natural Resources Plan that NASA is preparing. Predator intrusion is already a concern at Ames Research Center, and will be addressed and mitigated as discussed in Mitigation Measures BIO-4, 6, and 15 through the implementation of measures to prohibit pets in new housing, prohibit the feeding of wildlife, institute the use of trash containers that cannot be opened by wildlife, institute a public education program to teach the importance of excluding non-native predators from Ames Research Center, and augment the on-going efforts to control non-native predators in conjunction with USFWS. Please see response to Comment 21-31.

27-8: Please see the response to Comment 18-9.

27-9: As shown in Figure 2-5, parcels 7 and 8 in the Bay View area are designated as open space parcels in Alternative 5. They are located directly south of the burrowing owl habitat, and are not part of the golf course, which is located east of the airfield. The golf course is designated as Parcel 2. The open space designation of Parcels 8 and 9 would allow them to function as a biological buffer to the wetlands in the Bay View area as described on page 4.9-13 in this Final EIS. In

Mitigated Alternative 5, the buffer between the development and the wetlands has been increased to 61 meters (200 feet).

The commentor's point about the potential water quality issues related to golf course management is noted. However, no change to the golf course is proposed by the project. Moreover, the golf course is not intended to function as a biological buffer, although it does provide foraging habitat for burrowing owls, and it encompasses Marriage Road ditch, which provides habitat for the Western pond turtle.

27-10: Please see the response to Comment 18-9.

27-11: This is a closing comment that states an opinion and request for changes to the Preferred Alternative. No response is required.

From: Jim Fruchterman <jim@benetech.org>
To: "'researchpark@arc.nasa.gov'" <researchpark@arc.nasa.gov>
Subject: Comments on DEIS
Date: Sun, 27 Jan 2002 17:01:34 -0800

I'd like to support the option 5 recommended in the DEIS for NASA Ames.

One item we would like to add is support for nonprofits to participate in the new research park, nonprofits that don't have large sums to dedicate to the capital creation of the new campus. Our nonprofit organization benefited greatly from residing in the historic district of Shenandoah Plaza for the last three and a half years, and recently lost our lease there to a nonprofit that had greater financial capacity.

28-1

We understand NASA's challenge of creating a new research park without a significant capital budget, but hope that a portion of the new park will be available to the nonprofit sector on reasonable terms. We'd love to be able to return in the future and participate in a vibrant research community that includes our specialty: technology development for people with disabilities.

Jim Fruchterman
President & CEO
Benetech

480 S. California Ave, Suite 201
Palo Alto, CA 94306 USA
(650) 475-5440 x-106

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jim@benetech.org
www.benetech.org

The Benetech Initiative - Technology Serving Humanity
A nonprofit organization

LETTER 28

Jim Fruchterman, President and CEO, Benetech, January 27, 2002.

28-1: This comment expresses support for Alternative 5 and for non-profits to participate in the proposed development. No response is required.

Acterra

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Palo Alto CA 94303-4303

tel 650.962.9876
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www.Acterra.org
info@Acterra.org

FORMERLY *Bay Area Action + Peninsula Conservation Center Foundation*

January 27, 2002

Ms. Sandy Olliges
NASA Ames Research Center
MS 218-1
Moffett Field, CA 94035

Dear Ms. Olliges,

Acterra focuses on local sustainability issues in an effort to ensure that collectively we provide for the needs of current and future generations. NASA Ames Development Plan has evolved over the last several years and we applaud your work to incorporate important sustainability elements into this large re-development project.

We support NASA's desire "to develop a world-class, shared-use education research and development campus". Both NASA and the Bay Area are internationally recognized as innovators. Together we believe that we can create the absolute finest re-development effort. A plan that is worthy of NASA's stature and that embodies the strong environmental and sustainability ethics of our local communities.

During the development of the DEIS and NADP, NASA has incorporated many of the communities concerns and put forth a fifth alternative that embraces notable sustainable re-development elements. These include; completion of Ames' section of the Bay Trail, incorporating bicycle and pedestrian access to the facility, protecting burrowing owl habitat, refraining from developing in designated wetlands, landscaping with native plants and using reclaimed water for irrigation, incorporating green building practices, developing a transportation management plan, and providing open space and recreation areas into the project. **29-1**

While these elements go far toward mitigating the impacts of the project, the preferred alternative identifies traffic circulation, air quality and socio-economic impacts as significant and unavoidable. While we agree that they are significant, Acterra encourages NASA to reconsider if they are in fact unavoidable. We encourage you to take the final step toward a truly sustainable project and remedy these impacts by committing to eliminating the jobs-housing imbalance proposed by your project.

By creating more jobs than housing units, the plan results in additional vehicle trips and traffic congestion with attendant air quality impacts. However, if for every job you created a housing unit, NASA would reduce vehicle trips, traffic congestion and improve air quality. A project with no CEQA-determined environmental impact is within your reach and we strongly encourage you to attain that goal.

We believe that the community and our local and federal leaders would work with you to ensure that adjacent Federal property be made available to match job creation with housing. In order to

permit the project to proceed in a timely fashion we suggest that the additional housing be phased in over the life of the project, allowing sufficient time for transfer of additional Federal property to NASA control. If, for any reason, additional acreage is not available, identified housing sites should be increased in density to yield a one to one ratio of jobs to housing units.

29-1

We recognize that this request creates additional work for NASA, good work that future generations will acknowledge as exemplary in Federal sustainable development efforts. Together we can create healthy and livable communities. We remain available to support this effort by working with our elected officials and community to achieve an outcome that benefits us all.

Respectfully,

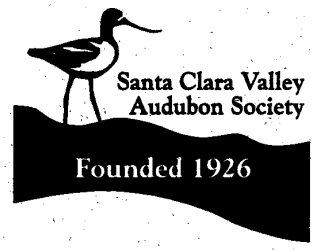
David Smernoff
Executive Director

cc:
Senator Dianne Feinstein
Senator Barbara Boxer
Representative Anna Eshoo
Mayor Sally Lieber, Mountain View
Mayor Fred Fowler, Sunnyvale

LETTER 29

David Smernoff, Executive Director, Acterra, January 27, 2002.

29-1: This comment expresses support for a shared-use education research and development campus, but requests further consideration of eliminating the jobs/housing imbalance. NASA has added an additional mitigation measure to Alternative 5, SOCIO-1b. This includes the addition of 370 more units in Bay View and 520 more units in NRP. In addition, NASA commits to working with DOD to obtain the military housing for NASA's use, to continue to evaluate the feasibility of additional housing over retail in NRP as the remediation proceeds, and to include at least 10 percent of housing priced to be affordable for those with low incomes.



January 28, 2002

Ms, Sandy Olliges
NASA Ames Research Center
Environmental Services Office, Mail Stop 218-1
Moffett Field, CA 94035-1000

Re: Comments on the NASA Redevelopment EIS

Dear Ms. Olliges,

Thank you for the opportunity to comment on the NASA Ames Redevelopment Plan. As the EIS clearly indicates, this is a long-term project that will have a vast impact on the region. As it is currently envisioned, the plan to redevelop NASA Ames does little to improve our quality of life, and it may unnecessarily impact the habitat in and around NASA Ames.

Burrowing Owl mitigation

The EIS very correctly identifies the potential impacts to the Burrowing Owl, a species of special concern in California. However, the mitigation should be significantly improved. The Moffett population of Burrowing Owls is the largest in the area, and its survival is critical to the presence of owls in the region.

Posting 25 mph speed limit signs along roads that intersect Burrowing Owl habitat, in all practical terms, will do little to protect these low-flying birds. A better solution would be to orient roads so that they do not lie between Burrowing Owl habitat and foraging areas, and so that traffic is routed as far from these areas as possible. In addition, buffer areas should be established between any type of development and Burrowing Owl habitats.

30-1

Because Burrowing Owls occur primarily near the golf course and the southern end of the airstrip, development in the Ames Campus should be sensitive to their presence. The Burrowing Owl Habitat Maintenance Plan prepared by Lynne Trulio should provide a good guide.

It will also be important to ensure that housing is built as far from sensitive habitats as possible. Dense housing developments, even those that do not allow pets, are likely to have more of an impact on habitat and special status species like the Burrowing

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Owl and the endangered Salt Marsh Harvest Mouse, than are campus industrial-type developments. 30-1

Species of Special Concern in California

The Burrowing Owl is not the only species of special concern that may occur in the wetlands near NASA Ames. Unfortunately, the EIS virtually ignored other species of special concern, such as star plant, for example. The potential impacts to these species should be given full consideration, as they would be addressed if this project were moving forward under CEQA. 30-2

Restoration possibilities

Although the Preferred Alternative does propose to put most of the development in the NASA Research Park, approximately one-fourth of the total square-footage would be built in Bay View for housing. From our perspective, this is the worst possible use of the Bay View parcel.

Development should not occur on the Bay View portion of Moffett. The Bay View area is an ideal piece of buffer land. Buffer areas can filter runoff, reduce siltation, and reduce flooding. In addition, the Bay View area may be foraging habitat for Burrowing Owls. As development in the Ames Campus interferes with other foraging habitat currently used by the owls, they may rely more and more on this parcel for food. 30-3

As we made clear, along with a number of conservation organizations, the City of Mountain View, the City of Sunnyvale, and the Santa Clara Basin Watershed Management Initiative, wetland restoration of Moffett Field's Site 25 is a possibility. Pressure from these entities, as well as members of the public forced the Navy to reconsider their proposed remediation of this site, and to take into account the possibility of its future restoration to tidal wetland. During the CERCLA public process for Site 25, the Mountain View City Council adopted a resolution that supports more thorough examination of remediation alternatives, because "a reasonably anticipated future land use of Moffett Field Site 25 is restoration to tidal marsh." In addition, the Baylands Ecosystem Habitat Goals document and the subsequent Restoring the Estuary document call for the creation of tidal marsh along large areas of the Bay's western shore. 30-4

The portions of Moffett adjacent to the Bay, including the Bay View parcel, may offer an excellent opportunity for restoration to tidal wetlands. Restoration of these areas, to allow the controlled flow of waters, fish, and wildlife from the San Francisco Bay into the Moffett Field wetlands, would greatly contribute to the ecological health of the San Francisco Bay estuary. Ultimately, the restoration of tidal wetlands could create a continuous corridor of marsh habitat that could benefit endangered species such as Clapper Rail, a small bird that lives only in tidal marshes, and the Salt Marsh Harvest Mouse. As such, the NASA should consult with the U.S. Fish and Wildlife Service regarding opportunities for restoration of wetland habitat along Moffett Field's bayfront.

In addition, NASA should allow the U.S. Fish and Wildlife Service to manage these lands as part of the Don Edwards National Wildlife Refuge. 30-4

Jobs/housing imbalance and traffic issues

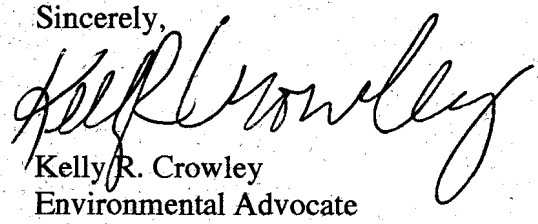
As you may be aware, the San Francisco Bay Area suffers from a severe job/housing imbalance. Housing is unaffordable for a large percentage of individuals and families. Traffic is regularly snarled on Highways 85, 101 and 237 through Mountain View and Sunnyvale. The EIS concludes very correctly that this project will have significant unavoidable impacts on both traffic and the jobs/housing imbalance. Housing is an essential component of any redevelopment plan. This project, in fact has the potential to help alleviate, rather than worsen, the job/housing imbalance and traffic congestion in the region. 30-5

Conclusion

Redevelopment of Moffett should incorporate a wide variety of land-uses, including open space and habitat. It should enhance the quality of life of Bay Area residents. The stated vision of a new Moffett is one of a high-tech, forward-looking research center. However, the Proposed Alternative is stale and demonstrates a real lack of vision, much like the Site 25 remediation plan originally proposed by the Navy. We hope that, like the Navy, NASA will see that the residents of the Bay Area demand, and deserve, a bright future built on sustainable communities and forward-thinking development. 30-6

Thank you for consideration of these issues. If you have any questions, please call me at (408) 252-3747.

Sincerely,



Kelly R. Crowley
Environmental Advocate

LETTER 30

Kelly R. Crowley, Environmental Advocate, Santa Clara Valley Audubon Society, January 28, 2002.

30-1: Please see response to Comment 21-38.

30-2: Species of special concern that occur or may occur at Ames Research Center are presented in Table 3.9-1 and 3.9-2. This list was generated from the California Natural Diversity Database of the California Department of Fish and Game,[10] the CalFlora database of the California Native Plant Society,[11] the US Fish and Wildlife Service, a review of local environmental documents, and consultations with local biologists, including NASA staff.

The status of these special-status plant and animal species are discussed for each development area in the Existing Biological Resources sections (3.9.C.1.a.iv, 3.9.C.1.b.ii, 3.9.C.2.a.iv, 3.9.C.2.b.ii, 3.9.C.3.a.v, 3.9.C.3.b.ii, 3.9.C.4). Much of the habitat that may support special-status species is located in the North of Bay View area, or in the wetland areas of the Bay View area. The design of the proposed action excluded construction within or near these sensitive areas to protect the species that occur there, often resulting in reduced or eliminated levels of impacts. Any impacts that were identified were considered and discussed in Section 4.9.

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[10] California Department of Fish and Game. 2000. *California Natural Diversity Database*. Available at http://www.dfg.ca.gov/. Accessed August 2001.

[11] California Native Plant Society. 2000. CalFlora: Information on California Plants for education, research, and conservation [web application]. Berkeley, California: The CalFlora Database [a non-profit organization]. Available at http://www.calflora .org/ Accessed August 2001.

The consulting biologists for this EIS are not aware of any special-status plant with the common name "star plant." Yellow star-thistle is common on the site; however, this species is a pest plant not native to California.

30-3: Please see the responses to Comments 21-14 and 21-31.

30-4: Please see the response to Comment 27-6.

30-5: This comment supports the conclusion of the DPEIS that the proposed project would have significant, unavoidable impacts on both traffic and the jobs/housing imbalance. The commentor expresses the opinion that the project could help alleviate these potential problems. NASA has added additional housing mitigation to lessen the impacts. Please see Comment 14-27.

30-6: This is a closing comment that expresses an opinion only. No response is required.

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January 28, 2002

Ms. Sandy Olliges
NASA/Ames Research Center
Mail Stop 218-1
Moffett Field, CA 94035-1000

Thank you for the opportunity to comment on the draft environmental impact statement (DEIS) for the proposed redevelopment plan at Moffett Federal Airfield (Moffett Field). As you are aware, Save The Bay has targeted Moffett Field as an important opportunity to restore historic South Bay wetlands, aid in recovery of endangered species, and improve Bay water quality. Our goals for Moffett Field are consistent with and supported by the recommendations of the San Francisco Bay Area Wetlands Ecosystem Goals Project (*Baylands Ecosystem Habitat Goals Report*) and the San Francisco Bay Joint Venture (*Restoring The Estuary: Implementation Strategy of the San Francisco Bay Joint Venture)*. These reports state the overall goal for the South Bay is restoring large areas of tidal marsh connected by wide corridors of related habitat along the Bay's perimeter. Therefore, securing acreage that will help meet this regional goal is of critical importance. Moffett Field provides an important piece of this goal.

Save The Bay has long envisioned restoring a continuum of wetland habitats in the Mountain View/Sunnyvale area, including the Cargill salt ponds, the mouth of Stevens Creek, and the Moffett Field wetlands and associated upland habitats. For this reason, we've worked with a coalition of stakeholders interested in restoring wetlands at Moffett Field—including Alliance for a New Moffett Field, Acterra, Ducks Unlimited, Center for Public Environmental Oversight, CLEAN South Bay, and the Silicon Valley Toxics Coalition—and created a vision for what could happen at the site's northern end. We want the cities of Mountain View and Sunnyvale to embrace and reclaim their Bay shoreline by restoring wetlands and related habitats, promoting recreation and open space, and creating livable communities that grow in a healthy, sustainable way. We hope NASA will embrace this vision as well. 31-1

We have concentrated our attention on NASA's Alternative #5 as it is the preferred alternative. Selection of this alternative concerns Save The Bay because it ignores the potential for significant onsite wetland restoration, provides no buffer for the site's historic wetlands that lie within the proposed boundaries of the Don Edwards National Wildlife Refuge, places a significant amount of fill on the Bay View parcel, and exacerbates the region's chronic jobs-housing imbalance. NASA talks about planning for the future and becoming a world-class research center, but in our opinion, this plan is not world-class. We envision a future that preserves dwindling open space and natural resources, especially tidal wetlands along the Mountain View/Sunnyvale shoreline.

After reviewing Alternative #5, Save The Bay has eight specific comments.

1) **The underutilized baylands at Moffett Field provide a significant opportunity for onsite wetland restoration that NASA is ignoring.** The San Francisco Estuary has lost nearly 95 percent of its historic wetlands, and the South Bay has lost approximately 50,000 acres of tidal marsh. The objectives of the San Francisco Bay Joint Venture are to restore and enhance 28,000 acres of bay habitat and seasonal wetlands (which includes upland grasslands) in the South Bay region. Restoring degraded wetlands and recreating historic wetlands will provide dramatic ecological benefits for the Estuary such as providing critical habitat for endangered 31-2

species and Pacific Flyway waterfowl, improving water quality, enhancing biodiversity, and permanently protecting open space. NASA should create a redevelopment plan for Moffett Field that embraces a variety of land uses, including restored wetlands and improved habitat. 31-2

2) **As a condition of approval for any development project at Moffett Field, NASA should agree to turn over management of the Moffett wetlands to the U.S. Fish & Wildlife Service (USFWS).** NASA lacks the resources, expertise, and historically the will to manage its wetlands habitat effectively. Since the stormwater retention pond and the Eastern and Western diked marshes all lie within the proposed boundaries of the Don Edwards National Wildlife Refuge, the management of these areas should be incorporated into Refuge operations. NASA should initiate discussions with USFWS to transfer either management or ownership of the wetlands to USFWS now, not at some later date. 31-3

3) **NASA should agree with the surrounding communities and the Mid-Peninsula Regional Open Space District, owner of a large portion of the stormwater retention pond, that tidal marsh is a reasonably anticipated future land use for the historic wetlands at Moffett Field.** If NASA adopted this position, the Navy would need to conduct more thorough remediation of Moffett's Site 25, which incorporates most of the historic wetlands. The introduction of tidal flows necessary for tidal wetland restoration at Moffett will require establishment of cleanup goals for metals, pesticides, and PCBs in sediment consistent with the presence of fish and fish-eating birds. Failure to do so will forever preclude tidal wetland restoration at Moffett Field. 31-4

4) **Designate the Bay View parcel as a critical habitat buffer.** Historically this parcel provided moist grasslands which supported seasonal swales and wetlands in wet years. These extremely productive habitats sustain large numbers of shorebirds and waterfowl, particularly during migration periods. They are also increasingly rare habitats because they are often filled and built upon while tidal wetlands are preserved, as is the case here.

The Bay View parcel provides an ideal natural buffer between urban development at Moffett Field and wetlands in the diked marshes and beyond (slated for inclusion in the Refuge). Providing adequate buffer zones is one of the *Baylands Ecosystem Habitat Goals Report*'s most important goals for the Mountain View subregion. Protecting the entire parcel from development will increase species diversity and reduce human disturbance and predator intrusion. Enhancing the existing seasonal wetlands on the parcel will also improve water quality by filtering site runoff and reducing siltation. 31-5

5) **While the inclusion of housing in Alternative #5 is commendable, Bay View is the wrong place for it because fill is required.** In order to provide "short-term" student housing on the subsided Bay View parcel, NASA must place 220,000 cubic yards of fill on the site. This is equivalent to 17,000 dump trucks full of dirt. This fill is needed to raise the proposed development above the floodplain. Placing housing in a floodplain is poor public policy, especially when it requires Bay fill. Save The Bay believes it is unacceptable, out-dated, and impractical to fill some of our last remaining baylands and related habitats, even if it will provide much needed housing. NASA should be proposing housing in a more appropriate upland location out of the floodplain. 31-6

6) **Burrowing owl habitat must not be fragmented.** Implementation of Alternative #5 will fragment existing burrowing owl habitats. NASA does not provide adequate assurances that either the transition process or long-term habitat protection efforts will sustain the onsite 31-7

burrowing owl population. The Burrowing Owl Habitat Management Plan included as part of the DEIS lacks sufficient specificity to adequately assess impacts to burrowing owls and must be improved. 31-7

7) **The DEIS must examine the impact of stricter stormwater requirements.** Alternative #5 will generate a substantial amount of stormwater runoff. However, the project does not appear to comply with the Regional Water Quality Control Board's new and more restrictive standards that will limit runoff into creeks such as Stevens Creek. A discussion of these new requirements should be included in the environmental analysis. The environmental impact statement and the mitigation and monitoring program need to identify the standards and techniques that will be used to reduce nonpoint source contamination in runoff from the project site. 31-8

8) **NASA should strive to create a development plan that is as cutting edge as the research it hopes to conduct.** Unless we want to become like Los Angeles, we must create more livable, sustainable communities that rely less on the automobile. Significant amounts of housing should be incorporated into Alternative #5 (although not on the Bay View parcel). This will decrease traffic congestion, improve air quality, help mitigate the jobs-housing imbalance, and reduce indirect impacts to the Bay. This will improve the quality of life for humans and wildlife alike. 31-9

We encourage NASA to embrace our vision in the preferred alternative and create a redevelopment plan for Moffett Field that embraces a variety of land uses, including restored wetlands and housing. It is time for Mountain View and Sunnyvale to reclaim their Bay shoreline. Local residents deserve nothing less.

Sincerely,

David Lewis

David Lewis, Executive Director
Save The Bay

LETTER 31

David Lewis, Executive Director, Save The Bay, January 28, 2002.

31-1: This is an introductory comment that summarizes Save The Bay's vision for wetlands restoration in the Mountain View/Sunnyvale area, and summarizes Save The Bay's key areas of concern. No response is required.

31-2: NASA's redevelopment plan does embrace a variety of land uses and does include improved burrowing owl habitat. NASA will continue to manage its wetlands for storm water management and habitat values. Wetland restoration is not within the scope of this project. See also response to Comment 27-5.

31-3: Please see the response to Comment 27-6.

31-4: Please see the response to Comment 27-6.

31-5: Shorebirds and waterfowl do not inhabit the Bay View parcel. There are no existing seasonal wetlands on the Bay View parcel. NASA has altered the layout of the housing in Bay View to maximize the natural buffer between the proposed housing and the existing diked marshes. This buffer would be used to improve water quality by filtering site runoff and reducing siltation.

31-6: Please see the response to Comments 21-14 and 21-31. Also, NASA has corrected the amount of fill needed to raise the 28 acres where housing would occur in the Bay View. It is 160,000 cubic yards, not 220,000 cubic yards. See page 0-11 of this FPEIS. This EIS also includes an analysis in Section 6.5.C, which justifies placement of fill in the floodplain.

31-7: Please see the response to Comment 21-38.

31-8: As described in Section 4.5 as revised in this Final EIS, the revised system would not increase the peak discharge into the Storm Water Retention Pond (SWRP). Also, structural elements have been incorporated into the design of the backbone storm drain system to reduce off-site pollutant loading. Through redesign of the Bay View housing storm drain system, NASA has eliminated the previously proposed outfall to Stevens Creek from Bay View. In addition, NASA has produced a list of Best Management Practices that have been incorporated on pages 2-27 through 2-29 of this Final EIS.

31-9: Please see the responses to Comments 14-27 and 21-14.

THE ALLIANCE FOR A NEW MOFFETT FIELD

January 28, 2002

Ms. Sandy Olliges
NASA Ames Research Center
Environmental Services Office
M.S. 218-1, Moffett Field, CA
94035-1000

Dear Ms. Olliges:

On behalf of the Alliance for a New Moffett Field, I am pleased to have the opportunity to comment on NASA's Draft Environmental Impact Statement (EIS) for the Ames Development Plan. We appreciate the professional approach taken by your office and your contractors, as well as the significant resource commitment that went into developing the draft.

32-1

However, we believe that the Draft EIS contains serious deficiencies. More important, both the Draft EIS analysis as well as our own additional review suggest that NASA must more thoroughly mitigate the housing, traffic, and other environmental impacts of the proposed development. In other words, the project should be scaled back or delayed until those impacts are alleviated.

1. **The Baseline**. In general, the Draft EIS understates the environmental conditions that would result from the proposed development by ignoring "approved" but un-built development on adjacent parcels. For example, the "lab project" included in the baseline land use plan is likely to create an additional shortfall of as many as 2,000 housing units, compared to today's conditions. That finding should be incorporated into the socio-economic analysis. Similarly, if any of the traffic-related findings ignore the impact of un-built baseline projects, they too should be updated.

32-2

32-3

2. **Housing**. The proposed Development Plan's calculable impact on the local and regional housing shortage should be more thoroughly analyzed and mitigated. The worsening jobs-housing imbalance not only threatens the quality of life and economies of surrounding communities, but it will make it difficult for NASA and its partners to attract world class employees and students to the Research Park.

32-4

A. Have all the housing requirements likely to be generated by the proposed

development been identified? Have student housing needs been adequately estimated? That is, do NASA's university partners know what mix of graduate and undergraduate students they expect to bring to Moffett Field? Do they know how many full-time vs. part-time students will take part in local academic programs? Do they expect the students to commute or reside on base? Is NASA including in its estimated the increased demand for service (food services, landscaping, janitorial, etc.) employees and other work which is typically contracted out? 32-4

Furthermore, if NASA and its partners "fill up" planned buildings to the intensity estimated in the plan, will they continue to hire employees and/or recruit students? The history of local companies suggests that intensity of use increases over time. Perhaps NASA should impose and document strict limits on jobs or students per floor area. 32-5

Finally, will the housing built in support of the project match the range of income levels of prospective employees and students? Will service workers and students be priced out of the market? Will well paid professionals shy away from the high density housing proposed by NASA? 32-6

B. Will Moffett Field development, both in the Baseline and Ames Development Plan, add to the regional allocation of "fair share" housing units to the adjacent cities. Presumably no such state requirement applies to NASA, but because it lies within the spheres of influence of both Mountain View and Sunnyvale, Moffett's employment increase could burden the cities' planning goals. 32-7

C. NASA has not done an adequate job exploring additional locations for housing. The site where NASA plans major housing construction, the Bay View parcel, is unsuitable for development (see below), so NASA must find even more land upon which to construct badly needed housing. NASA should consider off-base housing; it should consider a partnership with the Army to increase the use of property currently occupied by military housing; and it should evaluate possible housing construction on the airfield and East side of Moffett Field should the Air National Guard decide to relocate. 32-8

Furthermore, NASA should more carefully consider the long-term limitations on housing resulting from hazardous waste contamination. Many of us in the local community have worked with the Navy, the MEW companies, and the regulatory agencies for more than a decade to ensure that Moffett Field's cleanup objectives would allow unrestricted use. What portions of Moffett are currently clean enough for unrestricted uses? When will other portions be clean enough to support housing? To what degree can innovative construction techniques reduce exposures while cleanup is still taking place? 32-9

D. The proposed Research Park won't work if there is no place for students and employees to live. Therefore, job-creating construction should not be approved until adequate housing construction is approved and underway. 32-10

3. **Traffic and Air Pollution**. The Draft EIS does not adequately describe, and it clearly does not sufficiently propose to mitigate the traffic and resulting air pollution impacts that will result from the preferred alternative. Again, this will not only impact surrounding communities. It will discourage potential employees and students. 32-11

   A. By providing only a small amount of housing, it will appreciably increase regional traffic. The best way to mitigate regional transportation requirements is to build more housing on or near Moffett. 32-12

   B. By proposing to locate housing a distance from the light rail line, the core research park, and other facilities, it increases the likelihood that residents will drive in the course of their daily business. NASA should find ways to construct more housing near established transportation corridors. 32-13

   C. The proposed traffic mitigation measures are admirable, but there is no assurance that they will work, even at the levels suggested in the Draft EIS. Is NASA prepared to scale back development if early mitigation measures fail? 32-14

   D. There appears to be no analysis of the capacity of local bike routes and trails to absorb additional bicycle commuters. 32-15

   E. NASA should more fully estimate the number, routes, and timing of dump-trucks, other large trucks, and construction equipment. These will have a much more significant impact upon traffic and air pollution than other vehicles. Though NASA promises construction will be managed to reduce the generation of dust, will it take similar care to ensure that the dump trucks don't release dirt (and windshield-damaging rocks) on local and regional roadways. 32-16

   F. NASA has found that its proposed development "would result in population and vehicle-use projections that are inconsistent with regional air quality planning, and in emissions of air pollutants from automobiles and construction equipment which would exceed significant thresholds established by the BAAQMD." How might such a result influence the South Bay Area's eligibility for federal transportation funding? 32-17

4. **Bay Fill**. NASA's proposal to fill the Bay View parcel is absolutely unacceptable. It will undermine efforts to implement regional goals for restoring the San Francisco Bay and adjacent habitat, and it will jam our roadways with 34,000 new truck trips. 32-18

5. **Security**. NASA's proposal to move back the security perimeters at both the historic Ames labs and the airfield is an excellent idea. However, NASA should develop a flexible plan to make it possible to adjust those perimeters should public uses be approved in currently restricted areas. For example, at some point the golf course could be opened to the general public, or the proposed ferry terminal might be built at Moffett. 32-19

222D View Street, Mountain View, CA 94041 650/968-9076

6. **Noise**. NASA appears to fail to recognize fully that noise from existing activity at Moffett is likely to discourage people from working, studying, and living there. 32-20

   A. Contours showing average noise levels do not fully represent the impact of noise on communities. NASA should evaluate the interruptive quality of aircraft operations, engine tests, and wind tunnel operations as well. 32-21

   B. NASA should propose mitigation that includes control at the sources of noise, and Draft EIS assumptions based upon current flight activity and wind tunnel operations should be written as strict limits into Moffett Field's planning and management documents. 32-22

   C. Even if buildings are designed to limit indoor noise from outdoor activity, Californians spend a good deal of time out of doors and do not appreciate loud or intrusive noises. NASA should therefore consider ways to mitigate outdoor reception of noise in the research park, housing areas, and associated recreational facilities. 32-23

7. **Air Safety**. Though the active Moffett runways are near the proposed development, the Draft EIS appears not to address air safety issues. Should there be restrictions on building heights? Are proposed development areas sufficiently buffered from aircraft operations? 32-24

8. **Community Design**. At its public meetings, NASA displayed some attractive nominal designs for the proposed research park. We are confident that NASA, if it wins approval for the project, will insist upon the construction of nice-looking buildings and grounds. However, we believe it should go a step further. Instead of simply calling an industrial development a campus, we believe NASA and its partners have an opportunity to create a campus that integrates research space, housing, services, and transit. Such an approach would not only make development more compatible with the surrounding communities, it would help NASA achieve its own "world-class" goals. 32-25

In summary, we believe NASA's proposed world-class research park is a good idea, but its quick construction is not essential to NASA, its partners, or our local communities. NASA must figure out, in consultation with its neighbors and regulatory agencies, how to create an environmentally sensitive plan before it moves ahead with its proposal. Such a plan would not only benefit neighboring communities and NASA's current employees, but the world-class talent—and their families—that NASA hopes to attract to the research park campus. 32-26

Sincerely,

Lenny Siegel
Secretary, ANMF

222D View Street, Mountain View, CA 94041 650/968-9076

LETTER 32

Lenny Siegel, Secretary, Alliance for a New Moffett Field, January 28, 2002.

32-1: This is an introductory comment that expresses an opinion only. No response is required.

32-2: The Lab Project was entitled under the 1994 Comprehensive Use Plan Environmental Assessment (CUP EA). The NADP EIS incorporates the housing impacts generated by the CUP EA in its Cumulative Impacts discussion. This analysis is described as "cumulative" precisely because it analyzes the combined housing impact of the NADP, the Lab Project, and additional employment throughout the Bay Area between 2000 and 2015 on regional housing supply. Table 4.14-2 sums the additional household demand generated by these sources and compares the total to the "unconstrained unit potential" as estimated by ABAG to determine the regional housing surplus or shortfall by 2015.

32-3: As described in detail in Chapter 2, Section E, all known unbuilt developments on Moffett Field (entitled under the CUP EA) and in the cities of Mountain View and Sunnyvale were included in the baseline scenario to evaluate project impacts. In addition, a growth factor of one to two percent per year was applied to background intersection volumes to account for increases in regional traffic and unbuilt projects in other jurisdictions.

32-4: A detailed housing analysis has been added to Chapter 5 of this Final EIS.

NASA acknowledges that the NADP would generate employees at a variety of income levels and has analyzed housing needs by occupation (including service industry workers) and income category as part of its preliminary analysis of demand for housing at NRP. As part of the NADP master planning process, NASA has received preliminary

estimates of students from its university planning partners and has incorporated this information into its preliminary housing demand analysis. NASA anticipates that one or more of its Partners would conduct more detailed analysis of housing needs as part of NADP implementation. Please also see response to Comment 14-27.

32-5: Through the Mitigation Monitoring Program that it would adopt with the ROD, NASA would ensure that the levels of impacts associated with the NADP remain at or below the levels predicted in this EIS. If impacts begin to exceed those predicted in this EIS, NASA would either change future aspects of the project prior to build-out or implement additional mitigation measures to reduce impacts to predicted levels, or prepare another NEPA document.

32-6: See response to Comment 32-4.

32-7: Please see the response to Comment 21-13.

32-8: NASA believes Bay View is suitable for housing and has performed extensive studies to determine its suitability. See floodplain analysis in Section 6.5.C of this EIS. Please also see the responses to Comments 21-23 and 26-23.

NASA has added additional housing to the project in this Final EIS. Please see the response to Comment 14-27 for a description of this housing and 21-14 for analysis of other housing options.

32-9: Please see the response to Comment 24-1.

32-10: Please see the response to Comment 15-11.

32-11: This comment states an opinion only. No response is required. For more information on traffic and air quality mitigation measures, see Sections 4.3 and 4.4.

32-12: NASA's studies show that the amount of housing identified in the DPEIS does help in reducing regional traffic impacts that would otherwise occur under the project. As noted in response to Comment 14-27, more housing has been added to the project through Mitigation Measure SOCIO-1b.

32-13: Please see response to Comment 21-14 for a discussion of limitations on on-site housing. In addition, the network of on-site bike and pedestrian paths, along with the extensive on-site shuttle program, and the requirement to pay for parking in the NRP will effectively limit residents in the Bay View from driving to NRP.

32-14: The NRP TDM Program is modeled after successful TDM programs in the region and utilizes elements of those plans that have already been demonstrated to successfully reduce trips. While it is true that the NRP TDM is more aggressive than current programs for many industrial developments, it is very consistent with programs already in place at universities in the region, where a culture of using paid parking, shuttle service, and public transportation already exists. University partners would be major tenants of the NRP. It should be noted that the TDM that accompanies this Final EIS is conceptual and offers one example of what NASA's TDM Program under the NADP could be.

As described in the TDM Program, if early mitigation measures fail, the TMA would implement strategies to further discourage the use of single-occupancy vehicles and provide greater incentives for the use of alternative modes of transportation. If these strategies are proved unsuccessful, NASA and its partners would work together to evaluate how the development plan could be adjusted to meet TDM goals.

32-15: Consistent with transportation studies in the Cities of Mountain View and Sunnyvale and all jurisdictions within Santa Clara County, the potential impact of the project on bicycle facilities was analyzed in

terms of consistency with local regional planning efforts and the expansion of facilities as appropriate. The volume of bicyclists on routes and trails does not typically approach their respective "capacities," and the proposed project is not expected to generate a volume of bicycle traffic that would cause a problem with capacity on any existing or planned facility.

32-16: This EIS analyzed construction air quality impacts. Mitigation Measure AQ-6a (mistakenly labeled Mitigation Measure AQ-5a in the DPEIS and relabeled and revised in this Final EIS) includes measures to reduce dust from construction activity. Among other things, this mitigation measure would require haul trucks to cover loads or maintain 0.6 meters (2 feet) of freeboard. A disturbance coordinator would respond to any complaints. Prior to construction, detailed construction traffic plans would be prepared, including truck and haul routes.

32-17: As required by the federal Clean Air Act, the project NO_x emissions would be less than 91 tonnes (100 tons) per year. This ensures conformity with the provisions of the Clean Air Act in nonattainment areas.

32-18: This comment states an opinion only. No response is required. See also responses to Comments 21-19, 21-20 and 21-31.

32-19: Comment noted. NASA will consider this suggestion regarding flexibility in security fence locations in future planning efforts. However, moving the security fences is not part of the NADP, and no further analysis is appropriate in this EIS.

32-20: Noise impacts of existing uses on NADP development are thoroughly analyzed in Sections 3.10 and 4.10 of this EIS. Noise levels are not high enough to discourage working, studying or living at ARC, and these noise producing activities already occur on-site on a daily basis.

32-21: Noise levels could be described in many ways. However, the State and most communities have adopted the L_{dn} noise descriptor as the best way to describe noise exposure. Under Mitigated Alternative 5, Buildings 19 and 20 would be used for housing. Building 20 could be exposed to noise levels of 65 to 70 dBA, which is considered conditionally acceptable by HUD and California Planning Guidelines. These noise levels are considered above the conditionally acceptable level for Santa Clara County. Building 19 could be exposed to noise between 70 and 75 dBA, which is above the California Planning Guidelines conditionally acceptable level for residential uses, but is still conditionally acceptable to HUD. The EIS includes mitigation measures (Mitigation Measure NOISE-1a and NOISE-1b) that would provide a compatible interior and exterior noise environment for future occupants.

32-22: Noise from wind tunnel and flight operations is already mitigated at ARC to the extent feasible. Any future increase in noise from these operations above levels described in the NADP would require additional environmental review and an additional analysis of feasible mitigation measures, which NASA would undertake at that time. No expansion of noise-generating uses is proposed under the NADP, so no mitigation of these uses is needed in this EIS.

32-23: The best way to mitigate outdoor noise from sources at NASA is to place noise-sensitive uses as far as possible from substantial noise sources. During the land use design of the project, noise conditions were taken into account when locating planned housing or noise sensitive uses. Mitigation Measure NOISE-1a requires that site planning consider noise control to protect noise-sensitive outdoor activity areas.

32-24: An analysis of the alternatives' compatibility with the physical and operational use of the airfield has been added to Sections 4.2.B.3 of this Final EIS.

32-25: This comment states an opinion only. No response is required.

32-26: This comment states an opinion only. No response is required.

Date: Mon, 28 Jan 2002 10:01:36 -0800
From: John Toole <toole@computerhistory.org>
X-Accept-Language: en
To: researchpark@mail.arc.nasa.gov
Subject: Comments on EIS

To Whom It May Concern:

The vision of the NASA Research Park is creative, critically important to the entire area, and extremely well crafted. The development and debate on the EIS represents a difficult but important set of strategies that have been well conceived, and the document has reported all known impacts from many different perspectives. NASA, in my opinion, has carefully engaged different groups, individuals, partners, and cities to architect a plan for the future.

I strongly support the plan's development for the benefit of our future! It represents an important step forward while addressing the critically important environmental issues in the area. It is a conservative development approach that will benefit all future generations. Environmentally, I believe NASA has constructively addressed issues openly and in the most favorable way possible.

Progress leading to a better future, however, does not come completely free. To believe it does, is foolish. But to craft a solid, environmentally friendly approach, such as reported in this EIS is the responsible strategy for the area.

33-1

There are many challenges ahead - from the government's ability to execute on such a dream to unforeseen issues that will surface. However, having the right people, teams, and sensitivities in place throughout the communities, partners, and government will minimize our risks, plus continue the necessary forward progress for our future. Although I certainly have a vested interest in its success, I strongly favor approval and also recommend that the operational processes be accelerated to insure the smooth and timely development of this great vision.

We are committed to working closely with NASA and the partners, and will continue to craft an environmentally sound strategy as this visions become real.

John C. Toole
Executive Director & CEO
Computer History Museum

LETTER 33

John Toole, Executive Director and CEO, Computer History Museum, January 28, 2002.

33-1: This letter expresses support for the proposed project. It states an opinion only. No response is required.

Leonid Rappoport, Ph.D.
122 Flynn Ave., #D
Mountain View, CA 94043

12/10/01

Ms. Sandy Olliges
NASA Ames Research Center
Mail Stop 218-1
Moffett Field, CA 94035-1000

Dear Ms. Olliges,

Thank you for sending to my address the information about NASA Ames Development Plan.

As resident of this area I support a transformation of appropriate site of Moffett Field into scientific-cultural center.

On my side, let me offer my consulting service at the solution of any problems combined with Chemistry, especially in the R&D. 34-1

I have more than 40 years experience in the Polymer and Organic Chemistry including R&D, engineering activity and teaching.

I enclosed my short Curriculum Vitae.

Sincerely, Leonid Rappoport, Dr. of Chemical Science, Professor of Chemistry.

LETTER 34

Leonid Rappoport, Mountain View, December 10, 2001.

34-1: The commentor supports a scientific-cultural center at Moffett Field. No response is required.

COMMENT CARD

NASA Ames Development Plan Draft Environmental Impact Statement

Submit comments at meeting or mail to:

S. Olliges, M.S. 218-1, Moffett Field, CA 94035-1000

Comments must be submitted January 28, 2002

(Please Print)

Name JOHN GOULD

Title

Affiliation EAA

Address 19998 Glaystone lane [illegible] 95120

Email address GOULD 42@ AOL.com

Comments Provide AVIATION use for people to commute to work at the NASA sight. small general aviation aircraft could avoid SUNNYVALE overflight.

(use back if more space is needed)

35-1

COMMENT CARD

NASA Ames Development Plan Draft Environmental Impact Statement

Submit comments at meeting or mail to:

S. Olliges, M.S. 218-1, Moffett Field, CA 94035-1000

Comments must be submitted January 28, 2002

(Please Print)

Name JOHN GOULD

Title Chapter President

Affiliation EXPERIMENTAL AIRCRAFT ASSOC.

Address 19998 GRAYSTONE LANE // CA-95120

Email address GOULD42@AOL.COM

Comments

NEED AIRSPACE PLANNING TO EXCLUDE MOUNTAIN VIEW / SUNNYVALE OVERFLIGHTS FOR GENERAL AVIATION FUTURE NEEDS.

PROTECT CRITICAL RUNWAY ALIGN

(use back if more space is needed)

35-2

LETTER 35
John Gould, December 11, 2001.

35-1: This comment appears to suggest that aviation use for commuters be provided at Moffett Field. Commuter use of the airfield is outside of the scope of the proposed project. Furthermore, there are no plans to convert the airfield to commercial use.

35-2: This comment states an opinion about the need for airspace planning to exclude Mountain View/Sunnyvale overflights for future general aviation needs. No response is required.

COMMENT CARD

NASA Ames Development Plan Draft Environmental Impact Statement

Submit comments at meeting or mail to:

S. Olliges, M.S. 218-1, Moffett Field, CA 94035-1000

Comments must be submitted January 28 12-13-01 Sunnyvale

(Please Print)

Name Margaret Okuzumi

Title

Affiliation

Address 749 Winstead Terrace Sunnyvale 94087

Email address okuzumi@silcon.com

Comments I appreciate that you've improved this project to reduce the environmental impacts. However, you are still planning to add a population the size of a small city, without adequate housing for employees, their families, & ~~support~~ people who provide ~~supp~~ services to those folks. You must provide more housing & housing for very low and low-income folks to mitigate the impacts!

(use back if more space is needed)

36-1

LETTER 36

Margaret Okuzumi, December 13, 2001.

36-1: This comment requests that more housing and more low-income housing be added to the project. Please see the responses to Comments 14-27 and 32-4.

Trish Morrissey, 05:56 PM 3/11/02 -0800, ...: Comments on DEIS and Research Park

Date: Mon, 11 Mar 2002 17:56:32 -0800
To: sue@dceplanning.com
From: Trish Morrissey <tmorrissey@mail.arc.nasa.gov>
Subject: Fwd: Comments on DEIS and Research Park Plans
Cc: solliges@mail.arc.nasa.gov

Date: Thu, 13 Dec 2001 13:09:21 -0800 (PST)
From: "Michael J. Schuh" <schuh@apm-iris3.arc.nasa.gov>
To: researchpark@arc.nasa.gov
Subject: Comments on DEIS and Research Park Plans
Cc: michael@boardsailor.com
Reply-To: michael@boardsailor.com

Dear Research Park Team,

I appreciate the opportunity to comment on the DEIS and Research Park Plan. In short, I am excited about the additional research opportunities that will be provided by the proposed park. But I would like to see the housing development in the Bay View area dropped. I would rather see the space left open and I would rather NASA Ames not get into the housing business. I don't think we are well equipped for managing housing. 37-1 37-2 37-3

I would also like to see more improvement of the bicycle access to the base at the Moffett Blvd entrance. The current bike access to the base on Moffett Blvd is very dangerous. It would be fantastic if the Shoreline trail had a better connection to the base near N200 rather than having to go out to N258 cross over the water and back track to the N200 area. Am pleased to see the consideration given to the Burrowing Owl habitat and recreation. 37-4 37-5 37-6

Sincerely,
Michael Schuh

LETTER 37
Michael Schuh, December 13, 2001.

37-1: This comment expresses general approval for the NADP. No response is required.

37-2: This comment opposes housing on the Bay View due to biotic and open space impacts. Biotic impacts are addressed in the response to Comments 21-31 and 27-5. As noted in Section 4.9 of the EIS, adequate open space would remain on-site even after the Bay View is developed.

37-3: NASA would not manage on-site housing. It would be managed by project partners.

37-4: The City of Sunnyvale has been working to improve bike access along Moffett Park Drive, and NASA currently has no plans to conduct road-work in that area. NASA will continue to work, as appropriate, with regional projects that could positively effect bicycle accommodation. For example, in January 2002, NASA signed a Memorandum of Understanding with the Association of Bay Area Governments (ABAG) that should enable the completion of a segment of the Bay Trail between Mountain View and Sunnyvale, along the perimeter of NASA's property. This trail should provide greater opportunities for bicycle access from Sunnyvale to Ames.

The reconstruction of Moffett Boulevard includes the provision of bicycle lanes and replacement of the existing, uncontrolled loop ramps at the Highway 101 interchange (that are dangerous for bicyclists) with signalized ramp intersections. More controlled traffic would improve the environment for bicyclists and provide better access to the west side of the project site. In addition, the existing pedestrian/bicycle bridge across Stevens Creek near the eastern terminus of Charleston Avenue would be maintained. A plan has been

developed to provide bicycle lanes through the Ellis Street interchange, but the feasibility of this plan is still being evaluated.

37-5: This comment states an opinion only. No response is required.

37-6: This comment supports burrowing owl habitat preservation and recreation. No response is required.

DEIS Comments

COMMENT CARD date rec'd 12-3-02

NASA Ames Development Plan Draft Environmental Impact Statement
Submit comments at meeting or mail to:
S. Olliges, M.S. 218-1, Moffett Field, CA 94035-1000
Comments must be submitted January 28, 2002

(Please Print)

Name Daniel Dugan
Title Aerospace Engr/ Research Pilot
Affiliation NASA
Address ARH 210-5
Email address ddugan@mail.arc.nasa.gov

Comments

The name "AMES CAMPUS" - WHY IS THE "public" side to be called the NASA Research Park while we are to be a "CAMPUS" ??

Public perception will be that the research is done at the Park - what do we do on the CAMPUS - take classes?

(use back if more space is needed)

38-1

COMMENT CARD date rec'd 1-3-02

NASA Ames Development Plan Draft Environmental Impact Statement
Submit comments at meeting or mail to:
S. Olliges, M.S. 218-1, Moffett Field, CA 94035-1000
Comments must be submitted January 28, 2002

(Please Print)
Name DANIEL DUGAN
Title AeroEngr/Research Pilot
Affiliation NASA
Address ~~Ames~~ ARH 210-5
Email address ddugan@mail.arc.nasa.gov
Comments THE FENCE How much did it cost?
to include new gates, guard shacks, etc
Is it correct to assume that Research dollars were
diverted to construct "the wall"? (use back if more space is needed)

38-2

LETTER 38

Daniel Dugan, January 3, 2002.

38-1: The entire site, including lands that used to be the Naval Air Station Moffett Field, is now called Ames Research Center. NASA needed a way to differentiate between the areas within Ames Research Center that have distinct identities. "Ames Campus" was chosen to identify the area where NASA research programs have been and will continue to be primarily conducted. The term "campus" was intended to convey a geographically separate part that is complete in itself, having its own staff and physical facilities, and yet linked into the greater whole of Ames Research Center.

38-2: This is a comment on the security fence, which is not a part of the NADP. No response is required.

X-Originating-IP: [64.54.114.147]
From: "Brian Allen" <allenbrian_@hotmail.com>
To: researchpark@arc.nasa.gov
Subject: DEIS comments
Date: Fri, 18 Jan 2002 17:12:43 -0800
X-OriginalArrivalTime: 19 Jan 2002 01:12:44.0379 (UTC) FILETIME=[663362B0:01C1A086]

Dear Ms. Olliges:

Thank you for the opportunity to comment on the draft environmental impact statement (DEIS) for the proposed redevelopment at Moffett Field. As a member of Save The Bay, I have learned that NASA has selected Alternative #5 as its preferred alternative. This concerns me because this alternative provides no buffer for the site's historic wetlands that lie within the proposed boundaries of the Don Edwards National Wildlife Refuge, exacerbates the region's chronic jobs-housing imbalance, and ignores the potential for significant onsite wetland restoration. NASA talks about planning for the future and becoming a world-class research center, but in my opinion, this plan is not world-class. It proposes a staggering amount of new office space with a modest amount of student housing in a region plagued by chronic housing shortages at all economic levels. This is a recipe for skyrocketing housing costs and traffic. It is not sustainable in the long run, and not what I want for my community. I envision a future that preserves our dwindling open space and natural resources, especially tidal wetlands along the Bay shoreline.

39-1

With respect to Alternative #5, I have four specific comments.
1) As a condition of approval for any development project at Moffett Field, NASA must clean up the site's contaminated historic wetlands and turn them over to the U.S. Fish & Wildlife Service. The stormwater ponds and the Eastern and Western diked marshes all lay within the proposed boundaries for the Don Edwards National Wildlife Refuge. No matter what development proposal is pursued, these historic wetlands must be remediated to levels sufficient to support tidal wetland restoration. Once remediation is complete, these lands should be turned over to the Service. This will allow the Service to incorporate these lands into the refuge and conduct much needed tidal wetland restoration. The Site 25 cleanup process must not preclude such activities.

39-2

2) Designate the Bay View parcel as a critical habitat buffer.

Historically this parcel provided moist grasslands which supported seasonal swales and wetlands in wet years. These extremely productive habitats can sustain large numbers of shorebirds and waterfowl, particularly during migration periods. They are also increasingly rare habitats because they are often filled and built upon while tidal wetlands are preserved, as is the case here.

The Bay View parcel provides an ideal natural buffer between urban development at Moffett Field and wetlands in the diked marshes and beyond (slated for inclusion in the refuge). Providing adequate buffer zones is one of the Baylands Ecosystem Habitat Goals Report's most important goals for the Mountain View subregion. Protecting the entire parcel from development will increase species diversity and reduce human disturbance and predator intrusion. Enhancing the existing seasonal wetlands on the parcel will also improve water quality by filtering site runoff and reducing siltation.

39-3

3) While the inclusion of housing in Alternative #5 is commendable, Bay View is the wrong place for it because substantial fill is required. In order to provide "short-term" student housing on the subsided Bay View parcel, NASA must place 220,000 cubic yards of fill on the site. This is equivalent to 17,000 dump trucks full of dirt. This fill is needed to raise the proposed development above the floodplain. Placing housing in a floodplain is poor public policy, especially when it requires Bay fill. Save The Bay believes it is unacceptable, out-dated, and impractical to fill some of our last remaining baylands and related habitats, even if it will provide much needed housing. NASA should be proposing housing in a more appropriate upland location out of the floodplain.

39-4

4) NASA should strive to create a development plan that is as cutting edge as the research it hopes to conduct. The underutilized baylands at Moffett Field provide a significant opportunity for onsite wetland restoration that is being ignored. Save The Bay has long envisioned restoring a continuum of wetland habitats in the Mountain View/Sunnyvale area, including the Cargill salt ponds, the mouth of Stevens Creek, and the Moffett Field wetlands and associated upland habitats. This will provide critical habitat for endangered species and Pacific Flyway waterfowl, improve water quality, enhance biodiversity, and permanently protect open space. The vision also involves increased shoreline access and the creation of

39-5

more livable, sustainable communities that improve the quality of life for humans and wildlife alike. Significant amounts of housing should be incorp-orated into the preferred alternative (although not placed on Bay View). This will decrease traffic congestion, improve air quality, help mitigate the jobs-housing imbalance, and reduce indirect impacts to the Bay.

39-5

I encourage NASA to embrace the vision I have outlined and to develop a redevelopment plan for Moffett Field that embraces a variety of land uses, including restored wetlands and improved habitat. South Bay residents deserve nothing less.

Sincerely,

Brian Allen, MS
University of California, San Francisco
1600 Divisadero Street, Box 1693
San Francisco, CA 94115-1693
tel 415.885.7481
fax 415.885.3787
allenbrian_@hotmail.com
Brian.Allen@ucsfmedctr.org

LETTER 39
Brian Allen, San Francisco, January 18, 2002.

39-1: Please see the responses to Comments 14-3, 14-27, 18-9, 21-14, 27-1 and 27-5.

39-2: Historic wetlands are not jurisdictional wetlands, and are not protected under federal or state law. None of the alternatives would impact jurisdictional wetlands. It is not a project objective to restore historic wetlands, and such restoration is not required by law. Please refer also to the response to Comment 27-6.

39-3: Shorebirds and waterfowl do not inhabit the Bay View parcel. There are no existing seasonal wetlands on the Bay View parcel. NASA has altered the layout of the housing in Bay View to maximize the natural buffer between the proposed housing and the existing diked marshes. This buffer would be used to improve water quality by filtering site runoff and reducing siltation.

The proposed housing development of 11 hectares (28 acres) in the Bay View area would result in 22 hectares (54 acres) of open space preservation in the Bay View area, plus 4.5 hectares (11 acres) of recreational fields. NASA believes this is a balanced approach to the provision of much needed housing and open space preservation. NASA has determined that the Bay View area is the most appropriate location for housing consistent with the proposed NASA Ames Development Plan. NASA would implement mitigation measures to reduce human disturbance and predator intrusion. Specifically, Mitigation Measures BIO-4, BIO-7, BIO-11b, and BIO-15 call for low levels of lighting, the prohibition of pets, fencing to protect owl and other wildlife habitat, and efforts to control non-native predators.

39-4: Please see the responses to Comment 21-14, 21-31, and 31-6 as well as the floodplain analysis in Section 6.5.C.

39-5: NASA currently manages, and would continue to manage, its diked wetlands to provide habitat for endangered species and Pacific Flyway waterfowl, improving water quality through stormwater management, enhancing biodiversity, and permanently protecting open space. As stated in the DPEIS, NASA has signed a planning MOU with ABAG for the development of the Bay Trail along the northern portion of Moffett Field. NASA has committed to providing an easement for the Bay Trail to increase shoreline access.

NASA's vision, as described in the DPEIS, also involves the creation of more livable, sustainable communities that improve the quality of life for humans and wildlife alike. As additional mitigation, NASA has committed through Mitigation Measure SOCIO-1b in this Final EIS, to add additional housing units to the 1,040 units already proposed in the DPEIS, bringing the new total to 1,930 units. This would decrease traffic congestion, improve air quality, help mitigate the jobs-housing imbalance, and reduce indirect impacts to the Bay.

From: "Jim Gonsman" <jgonsman@speakeasy.net>
To: <researchpark@arc.nasa.gov>
Subject: Moffett Field Redevelopment
Date: Fri, 18 Jan 2002 17:43:01 -0800
X-Priority: 3 (Normal)
Importance: Normal

Dear Ms. Olliges:

Thank you for the opportunity to comment on the draft environmental impact statement for the proposed redevelopment at Moffett Field.

I would urge NASA to consider the following modifications to its preferred Alternative #5.

1. Remediate existing contaminated historic wetlands and related habitats and turned them over to the U. S. Fish and Wildlife Service. **40-1**

2. Provide a buffer between these wetlands and any proposed urban development. **40-2**

3. Eliminate development which requires the placement of imported fill in wetlands or related habitat. **40-3**

Sincerely,

James Gonsman
9 Antonette Avenue
San Rafael, CA 94901

LETTER 40

James Gonsman, San Rafael, January 18, 2002.

40-1: Please refer to the response to Comment 27-6.

40-2: Please refer to the response to Comment 18-9.

40-3: Please refer to the response to Comment 21-31.

From: BetteUK@aol.com
Date: Fri, 18 Jan 2002 21:17:52 EST
Subject: restoring the wetlands
To: researchpark@arc.nasa.gov

To Ms. Sandy Olliges:

Dear Ms. Olliges:

I am writing to support the restoration of our local wetlands. 41-1

I especially hope that such a project will lead those in leadership positions to direct their attention to the Big Sur Flight path that the FAA and SFO directs over our communities. The unregulated emissions effect all of the environment of our area-including the wetlands.

The aircraft emissions are toxic and several research studies have now associated exposure to flight path emissions with cancer and other diseases. In addition, the stress from the noise has been associated with increases in hypertension and heart disease.

41-2

No agency nor governmental official exists to protect citizens from these serious abuses.

Should it be of interest to you and/or your associates, I would be glad to provide you with the appropriate scientific references.

If you have suggestions for help for those who are suffering from the flight path noise and emissions, please do let me know.

Thank you for considering my concerns.

Bette Kiernan
2337 Williams St.
Palo Alto, Ca. 94306

650 324 3639

LETTER 41

Bette Kiernan, Palo Alto, January 18, 2002.

41-1: This comment expresses support for the restoration of local wetlands. Wetlands restoration is not within the scope of this project. No response is required.

41-2: This is a comment about activities at San Francisco Airport that are outside the scope of this project. No response is required. Wetland restoration is not within the scope of this project.

X-Originating-IP: [158.252.211.54]
From: "Robert Rogers" <rogersra@hotmail.com>
To: researchpark@arc.nasa.gov
Subject: Fwd: Save The Bay Action Alert!
Date: Fri, 18 Jan 2002 18:42:32 -0800
X-OriginalArrivalTime: 19 Jan 2002 02:42:32.0582 (UTC) FILETIME=[F1D1EA60:01C1A092]

This all sounds reasonable and do-able to me. I hope you seriously consider these issues before making any final decision. I would assume that you want an enviornmentally friendly project and one that is sustainable to wetland, habitat, and lack of bay fill.

Thanks,

Bob Rogers

Concerned Citizen

>From: "Save The Bay"
>To:
>Subject: Save The Bay Action Alert!
>Date: Fri, 18 Jan 2002 17:30:26 -0800 (PST)
>
>January 18, 2002
>
>Dear Robert:
>
>Save The Bay has targeted the Moffett Federal Airfield (Moffett Field) as an important opportunity to restore historic South Bay wetlands, aid in recovery of endangered species, and improve Bay water quality. We have long envisioned restoring a continuum of wetland habitats in the Mountain View/Sunnyvale area, including the Cargill salt ponds, the mouth of Stevens Creek, and the Moffett Field wetlands and associated upland habitats.
>
>For this reason, we've worked hard to build a coalition of stakeholders interested in restoring wetlands at Moffett Field-including Alliance for a New Moffett Field, Acterra, Ducks Unlimited, and the Silicon Valley Toxics Coalition-and created a vision for what could happen at the site's northern end. We want the cities of Mountain View and Sunnyvale to embrace and reclaim their Bay shoreline by promoting recreation and open space, restoring wetlands and related habitats, and creating livable communities that grow in a healthy, sustainable way.
>
>Last year, NASA proposed redeveloping the former military base and Ames Research Center. In late 2001, NASA released the draft environmental impact statement for its development proposal. Save The Bay believes NASA's preferred alternative (Alternative #5) is flawed because it provides no buffer for the site's historic wetlands although they lie with the proposed boundaries of the Don Edwards National Wildlife Refuge, exacerbates the region's chronic jobs-housing imbalance, and ignores the potential for significant onsite wetland restoration.
>
>But you can help! NASA is accepting public comments on its development plan until Monday, January 28, 2002. Below you will find: 1) directions on how to submit comments to NASA and 2) Save The Bay's sample letter

42-1

(feel free to use). Please take a few minutes to write or email comments to NASA (or attend a public hearing if you are a Mountain View resident) to ensure that redevelopment at Moffett Field helps Mountain View and Sunnyvale reclaim their Bay shoreline. Thanks for your help.
>
> 1) HOW TO SUBMIT COMMENTS
>
> Send written comments to Ms. Sandy Olliges, NASA/Ames Research Center, Environmental Services Office, Mail Stop 218-1, Moffett Field, CA 94035-1000. Or email researchpark@arc.nasa.gov. The deadline is January 28, 2002.
>
> If you live in Mountain View or Sunnyvale, send copies of your letter to your city council members.
>
> Mountain View residents can also attend a public hearing on this issue. The Mountain View City Council will listen to public comments on the NASA proposal on Tuesday, January 22, 2002 at 6:30 pm. The hearing will be held at the Mountain View City Hall on Castro Street.
> 2) SAVE THE BAY'S SAMPLE LETTER
>
>[Date]
>
>Dear Ms. Olliges:
>
>Thank you for the opportunity to comment on the draft environmental impact statement (DEIS) for the proposed redevelopment at Moffett Field. As a member of Save The Bay, I have learned that NASA has selected Alternative #5 as its preferred alternative. This concerns me because this alternative provides no buffer for the site's historic wetlands that lie with the proposed boundaries of the Don Edwards National Wildlife Refuge, exacerbates the region's chronic jobs-housing imbalance, and ignores the potential for significant onsite wetland restoration. NASA talks about planning for the future and becoming a world-class research center, but in my opinion, this plan is not world-class. It proposes a staggering amount of new office space with a modest amount of student housing in a region plagued by chronic housing shortages at all economic levels. This is a recipe for skyrocketing housing costs and traffic. It is not sustainable in the long run, and not what I wan! t for my community. I envision a future that preserves our dwindling open space and natural resources, especially tidal wetlands along the Bay shoreline.

42-1

>
>With respect to Alternative #5, I have four specific comments.
> 1) As a condition of approval for any development project at Moffett Field, NASA must clean up the site's contaminated historic wetlands and turn them over to the U.S. Fish & Wildlife Service. The stormwater ponds and the Eastern and Western diked marshes all lay within the proposed boundaries for the Don Edwards National Wildlife Refuge. No matter what development proposal is pursued, these historic wetlands must be remediated to levels sufficient to support tidal wetland restoration. Once remediation is complete, these lands should be turned over to the Service. This will allow the Service to incorporate these lands into the refuge and conduct much needed tidal wetland restoration. The Site 25 cleanup process must not preclude such activities.
>
>2) Designate the Bay View parcel as a critical habitat buffer. Historically this parcel provided moist grasslands which supported seasonal swales and wetlands in wet years. These extremely productive habitats can sustain large numbers of shorebirds and waterfowl, particularly during migration periods. They are also increasingly rare

habitats because they are often filled and built upon while tidal wetlands are preserved, as is the case here.
>
> The Bay View parcel provides an ideal natural buffer between urban development at Moffett Field and wetlands in the diked marshes and beyond (slated for inclusion in the refuge). Providing adequate buffer zones is one of the Baylands Ecosystem Habitat Goals Report's most important goals for the Mountain View subregion. Protecting the entire parcel from development will increase species diversity and reduce human disturbance and predator intrusion. Enhancing the existing seasonal wetlands on the parcel will also improve water quality by filtering site runoff and reducing siltation.
>
> 3) While the inclusion of housing in Alternative #5 is commendable, Bay View is the wrong place for it because substantial fill is required. In order to provide "short-term" student housing on the subsided Bay View parcel, NASA must place 220,000 cubic yards of fill on the site. This is equivalent to 17,000 dump trucks full of dirt. This fill is needed to raise the proposed development above the floodplain. Placing housing in a floodplain is poor public policy, especially when it requires Bay fill. Save The Bay believes it is unacceptable, out-dated, and impractical to fill some of our last remaining baylands and related habitats, even if it will provide much needed housing. NASA should be proposing housing in a more appropriate upland location out of the floodplain.
>
> 4) NASA should strive to create a development plan that is as cutting edge as the research it hopes to conduct. The underutilized baylands at Moffett Field provide a significant opportunity for onsite wetland restoration that is being ignored. Save The Bay has long envisioned restoring a continuum of wetland habitats in the Mountain View/Sunnyvale area, including the Cargill salt ponds, the mouth of Stevens Creek, and the Moffett Field wetlands and associated upland habitats. This will provide critical habitat for endangered species and Pacific Flyway waterfowl, improve water quality, enhance biodiversity, and permanently protect open space. The vision also involves increased shoreline access and the creation of more livable, sustainable communities that improve the quality of life for humans and wildlife alike. Significant amounts of housing should be incorp-orated into the preferred alternative (although not placed on Bay View). This will decrease traffic co! ngestion, improve air quality, help mitigate the jobs-housing imbalance, and reduce indirect impacts to the Bay.
>
> I encourage NASA to embrace the vision I have outlined and to develop a redevelopment plan for Moffett Field that embraces a variety of land uses, including restored wetlands and improved habitat. South Bay residents deserve nothing less.
>
> Sincerely,
> [Your name]
>
>
>
>
>----------
> powered by ebase(tm) v1.02. mailto:info@ebase.org, http://www.ebase.org
> #000000000-23617-[AA0102EA]. Registered to egroup.
>----------
>

42-2

LETTER 42

Bob Rogers, January 18, 2002.

42-1: This is a reproduction of Letter 39 with some minor additions. Please refer to the responses to that letter.

From: GMcinSJ@webtv.net (Gloria McClain)
Date: Sat, 19 Jan 2002 09:44:57 -0800 (PST)
To: researchpark@arc.nasa.gov
Subject: NASA DEIS Statement

January 19, 2002

Dear Ms. Olliges:

During the year of 2000, I spent all of my available time working with a grassroots organization to point out the flaws of, and contradictions within a DEIR. Eventually, we found several violations of CEQA (California Environmental Quality Act), and documents showing that decisions which should have been made based on the DEIR were, in fact, made 10 years before. Although the council members allowed time for us to speak, no amount of logical discussion from the community was considered by the politicians making the decisions. 43-1

I send this letter to you today, hoping that your organization is truly open to discussion, consideration and modification of your proposed plan.

Thank you for the opportunity to comment on the draft environmental impact statement (DEIS) for the proposed redevelopment at Moffett Field. As a member of Save The Bay, I have learned that NASA has selected Alternative #5 as its preferred alternative. This concerns me because this alternative provides no buffer for the site's historic wetlands that lie with the proposed boundaries of the Don Edwards National Wildlife Refuge, exacerbates the region's chronic jobs-housing imbalance, and ignores the potential for significant onsite wetland restoration. NASA talks about planning for the future and becoming a world-class research center, but in my opinion, this plan is not world-class. It proposes a staggering amount of new office space with a modest amount of student housing in a region plagued by chronic housing shortages at all economic levels. This is a recipe for skyrocketing housing costs and traffic. It is not sustainable in the long run, and not what I want for my community. I envision a future that preserves our dwindling open space and natural resources, especially tidal wetlands along the Bay shoreline. 43-2
With respect to Alternative #5, I have four specific comments.

1) As a condition of approval for any development project at Moffett Field, NASA must clean up the site's contaminated historic wetlands and turn them over to the U.S. Fish & Wildlife Service. The stormwater ponds and the Eastern and Western diked marshes all lay within the proposed

boundaries for the Don Edwards National Wildlife Refuge. No matter what development proposal is pursued, these historic wetlands must be remediated to levels sufficient to support tidal wetland restoration. Once remediation is complete, these lands should be turned over to the Service. This will allow the Service to incorporate these lands into the refuge and conduct much needed tidal wetland restoration. The Site 25 cleanup process must not preclude such activities.

2) Designate the Bay View parcel as a critical habitat buffer. Historically this parcel provided moist grasslands which supported seasonal swales and wetlands in wet years. These extremely productive habitats can sustain large numbers of shorebirds and waterfowl, particularly during migration periods. They are also increasingly rare habitats because they are often filled and built upon while tidal wetlands are preserved, as is the case here.
The Bay View parcel provides an ideal natural buffer between urban development at Moffett Field and wetlands in the diked marshes and beyond (slated for inclusion in the refuge). Providing adequate buffer zones is one of the Baylands Ecosystem Habitat Goals Report's most important goals for the Mountain View subregion. Protecting the entire parcel from development will increase species diversity and reduce human disturbance and predator intrusion. Enhancing the existing seasonal wetlands on the parcel will also improve water quality by filtering site runoff and reducing siltation.

43-2

3) While the inclusion of housing in Alternative #5 is commendable, Bay View is the wrong place for it because substantial fill is required. In order to provide "short-term" student housing on the subsided Bay View parcel, NASA must place 220,000 cubic yards of fill on the site. This is equivalent to 17,000 dump trucks full of dirt. This fill is needed to raise the proposed development above the floodplain. Placing housing in a floodplain is poor public policy, especially when it requires Bay fill. Save The Bay believes it is unacceptable, out-dated, and impractical to fill some of our last remaining baylands and related habitats, even if it will provide much needed housing. NASA should be proposing housing in a more appropriate upland location out of the floodplain.

4) NASA should strive to create a development plan that is as cutting edge as the research it hopes to conduct. The underutilized baylands at Moffett Field provide a significant opportunity for onsite wetland restoration that is being ignored. Save The Bay has long envisioned restoring a continuum of wetland habitats in the Mountain View/Sunnyvale area, including the Cargill salt ponds, the mouth of Stevens Creek, and the Moffett Field wetlands and associated upland habitats. This will

provide critical habitat for endangered species and Pacific Flyway waterfowl, improve water quality, enhance biodiversity, and permanently protect open space. The vision also involves increased shoreline access and the creation of more livable, sustainable communities that improve the quality of life for humans and wildlife alike. Significant amounts of housing should be incorporated into the preferred alternative (although not placed on Bay View). This will decrease traffic congestion, improve air quality, help mitigate the jobs-housing imbalance, and reduce indirect impacts to the Bay.

I encourage NASA to embrace the vision I have outlined and to develop a redevelopment plan for Moffett Field that embraces a variety of land uses, including restored wetlands and improved habitat. South Bay residents deserve nothing less.

Sincerely,

Gloria McClain

43-2

LETTER 43
Gloria McClain, January 19, 2002.

43-1: This comment is an introduction. No response is required.

43-2: This is a reproduction of Letter 39. Please refer to responses to Letter 39.

From: SchoopJ@aol.com
Date: Sat, 19 Jan 2002 01:05:09 EST
Subject: Moffett Field development plan
To: Researchpark@arc.nasa.gov

Dear Ms. Sandy Olliges:

Thank you for the opportunity to comment on the draft environmental impact statement for the proposed redevelopment of Moffett Field.

I have learned that NASA has selected Alternative #5 as is preferred alternative. I am concerned that this alternative provides no buffer for the historic wetlands that lie within the proposed boundaries of the Don Edwards National Wildlife Refuge. It worsens the already bad jobs-housing imbalance. And it misses the opportunity for restoring wetlands on the site. 44-1 44-2 44-3

Furthermore, the plan proposes far too much office space with much too little offsetting housing. There is already a much too great jobs-housing balance in that area. Without a good jobs-housing balance, it exaggerates the commuting and housing costs problems. 44-4

On the other hand, NASA should try to develop a plan that restores the wetlands on the site. San Fransico Bay is a national treasure and should be treated as such. To do that, not only should the marshes be restored, but also much more housing should be included in the preferred alternative to lessen traffic congestion and thereby improve air quality (which is worst in the South Bay because of the southern flow of air over the bay). 44-5 44-6

I hope NASA will see the positive possibilities for this site and develop a plan much more suited to it. 44-7

Thank you.

Jack Schoop
6312 Stone Bridge Road
Santa Rosa CA 95409-5824

LETTER 44

Jack Schoop, Santa Rosa, January 19, 2002.

44-1: Please refer to the response to Comment 18-9.

44-2: Please refer to the response to Comment 14-27.

44-3: The opportunity for wetland restoration not a project objective, and is not within the scope of this project. Please refer to the response to Comment 14-6.

44-4: Please refer to the response to Comment 14-27.

44-5: The opportunity for wetland restoration not a project objective, and is not within the scope of this project. Please refer to the response to Comment 14-6.

44-6: Please refer to the response to Comment 14-27.

44-7: This is a concluding comment and requires no response.

From: "Paul Denton" <pnedenton@paradise.net.nz>
To: <researchpark@arc.nasa.gov>
Cc: <alert@savesfbay.org>
Subject: Moffett Field Wetlands Restoration Opportunity
Date: Sun, 20 Jan 2002 17:39:29 +1300
X-Priority: 3

20 January 2002

Dear Ms. Olliges:

As a former resident of Mountain View and Sunnyvale and current property owner in San Mateo I am particularily interested in enhancing the remnant wetlands as a part of Moffet Field site development opportunities. **45-1**

Thank you for the opportunity to comment on the draft environmental impact statement (DEIS) for the proposed redevelopment at Moffett Field. As a member of Save The Bay, I have learned that NASA has selected Alternative #5 as its preferred alternative. This concerns me because this alternative provides no buffer for the site's historic wetlands that lie with the proposed boundaries of the Don Edwards National Wildlife Refuge, exacerbates the region's chronic jobs-housing imbalance, and ignores the potential for significant onsite wetland restoration. NASA talks about planning for the future and becoming a world-class research center, but in my opinion, this plan is not world-class. It proposes a staggering amount of new office space with a modest amount of student housing in a region plagued by chronic housing shortages at all economic levels. This is a recipe for skyrocketing housing costs and traffic. It is not sustainable in the long run, and not what I want for my community. I envision a future that preserves our dwindling open space and natural resources, especially tidal wetlands along the Bay shoreline.

With respect to Alternative #5, I have four specific comments.
1) As a condition of approval for any development project at Moffett Field, NASA must clean up the site's contaminated historic wetlands and turn them over to the U.S. Fish & Wildlife Service. The stormwater ponds and the Eastern and Western diked marshes all lay within the proposed boundaries for the Don Edwards National Wildlife Refuge. No matter what development proposal is pursued, these historic wetlands must be remediated to levels sufficient to support tidal wetland restoration. Once remediation is complete, these lands should be turned over to the Service. This will allow the Service to incorporate these lands into the refuge and conduct much needed tidal wetland restoration. The Site 25 cleanup process must not preclude such activities. **45-2**

2) Designate the Bay View parcel as a critical habitat buffer. Historically this parcel provided moist grasslands which supported seasonal swales and wetlands in wet years. These extremely productive habitats can sustain large numbers of shorebirds and waterfowl, particularly during migration periods. They are also increasingly rare habitats because they are often filled and built upon while tidal wetlands are preserved, as is the case here.

The Bay View parcel provides an ideal natural buffer between urban development at Moffett Field and wetlands in the diked marshes and beyond (slated for inclusion in the refuge). Providing adequate buffer zones is one of the Baylands Ecosystem Habitat Goals Report's most important goals for the Mountain View subregion. Protecting the entire parcel from development will increase species diversity and reduce human disturbance and predator intrusion. Enhancing the existing seasonal wetlands on the parcel will also improve water quality by filtering site runoff and reducing siltation.

3) While the inclusion of housing in Alternative #5 is commendable, Bay View is the wrong place for it because substantial fill is required. In order to provide "short-term" student housing on the subsided Bay View parcel, NASA must place 220,000 cubic yards of fill on the site. This is equivalent to 17,000 dump trucks full of dirt. This fill is needed to raise the proposed development above the floodplain. Placing housing in a floodplain is poor public policy, especially when it requires Bay fill. Save The Bay believes it is unacceptable, out-dated, and impractical to fill some of our last remaining baylands and related habitats, even if it will provide much needed housing. NASA should be proposing housing in a more appropriate upland location out of the floodplain.

4) NASA should strive to create a development plan that is as cutting edge as the research it hopes to conduct. The underutilized baylands at Moffett Field provide a significant opportunity for onsite wetland restoration that is being ignored. Save The Bay has long envisioned restoring a continuum of wetland habitats in the Mountain View/Sunnyvale area, including the Cargill salt ponds, the mouth of Stevens Creek, and the Moffett Field wetlands and associated upland habitats. This will provide critical habitat for endangered species and Pacific Flyway waterfowl, improve water quality, enhance biodiversity, and permanently protect open space. The vision also involves increased shoreline access and the creation of more livable, sustainable communities that improve the quality of life for humans and wildlife alike. Significant amounts of housing should be incorp-orated into the preferred alternative (although not placed on Bay View). This will decrease traffic congestion, improve air quality, help mitigate the jobs-housing imbalance, and reduce indirect impacts to the Bay.

45-2

I encourage NASA to embrace the vision I have outlined and to develop a redevelopment plan for Moffett Field that embraces a variety of land uses, including restored wetlands and improved habitat. South Bay residents deserve nothing less.

Sincerely,

Paul Denton

LETTER 45
Paul Denton, January 20, 2002.

45-1: This comment states the commentor's support for enhancing wetlands as part of the Moffett Field development. Wetland restoration is not a part of this project and is not in the scope of this EIS. No response is required.

45-2: The remaining comments are the same as those in Letter 39. Please refer to responses to Letter 39.

X-EM-Version: 5, 0, 0, 0
X-EM-Registration: #3003520714B31D032830
Reply-To: mmmarkus@earthlink.net
From: "Mary Markus" <mmmarkus@earthlink.net>
To: researchpark@arc.nasa.gov
Subject: San Francisco Bay-Moffett Field
Date: Sun, 20 Jan 2002 18:25:1 -0800

Please accept my affirmation of the letters sent by Save the Bay friends. They have done a wonderful job so far, and have good science on their side. Please give the Bay a chance. I lived in Oakland 50 years ago, and I still treasure the bay. Sincerely, Mary Markus

46-1

--- Mary Markus
--- <mailto:mmmarkus@earthlink.net> mmmarkus@earthlink.net
--- EarthLink: The #1 provider of the Real Internet.

LETTER 46

Mary Markus, January 20, 2002.

46-1: This comment supports the comments presented by Save The Bay in Letters 31 and 39. Please refer to the responses to those letters. No further response is required.

Date: Sun, 20 Jan 2002 14:50:50 -0800 (PST)
From: June Swan <juneswan@yahoo.com>
Subject: NO
To: researchpark@arc.nasa.gov

Please, we need a buffer for our historic wetlands...don't exaserbate our jobs/housing problems....No to NASA's Moffett project, Please.

47-1

LETTER 47

June Swan, January 20, 2002.

47-1: This comment expresses an opinion in opposition to the project. No further response is required. Please see response to comments to Letter 39.

Date: Sun, 20 Jan 2002 13:29:03 -0800
From: Frederick Willsea <fredwillsea@worldnet.att.net>
X-Accept-Language: en
To: researchpark@arc.nasa.gov
Subject: Development at NASA-Ames

Pay attention to Save the Bay! 48-1

LETTER 48

Frederick Willsea, January 20, 2002.

48-1: This comment supports the comments presented by Save The Bay in Letters 31 and 39. Please refer to the responses to those letters. No further response is required.

X-EM-Version: 5, 0, 0, 0
X-EM-Registration: #3003520714B31D032830
Reply-To: danhodapp@earthlink.net
From: "Dan Hodapp" <danhodapp@earthlink.net>
To: researchpark@arc.nasa.gov
Subject: Moffett Field
Date: Mon, 21 Jan 2002 6:43:30 -0800

Dear Ms. Olliges:

Thank you for the opportunity to comment on the draft environmental impact statement (DEIS) for the proposed redevelopment at Moffett Field. As members of Save The Bay, we have learned that NASA has selected Alternative #5 as its preferred alternative. This concerns us because this alternative provides no buffer for the site's historic wetlands that lie with the proposed boundaries of the Don Edwards National Wildlife Refuge, exacerbates the region's chronic jobs-housing imbalance, and ignores the potential for significant onsite wetland restoration. NASA talks about planning for the future and becoming a world-class research center, but in our opinion, this plan is not world-class. We do not need massive office development -- we need preservation and enhancement of our wetlands. Our Bay is already much diminished from its natural state and people and wildlife have suffered.

With respect to Alternative #5, here are our four specific comments.

1) As a condition of approval for any development project at Moffett Field, NASA must clean up the site's contaminated historic wetlands and turn them over to the U.S. Fish & Wildlife Service.

2) Designate the Bay View parcel as a critical habitat buffer. Providing adequate buffer zones is one of the Baylands Ecosystem Habitat Goals Report's most important goals for the Mountain View subregion. Protecting the entire parcel from development will increase species diversity and reduce human disturbance and predator intrusion. Enhancing the existing seasonal wetlands on the parcel will also improve water quality by filtering site runoff and reducing siltation.

3) While the inclusion of housing in Alternative #5 is commendable, Bay View is the wrong place for it because substantial fill is required. No more fill in our Bay!!!
NASA should be proposing housing in a more appropriate upland location out of the floodplain.

4) We need a continuum of wetland habitats in the Mountain View/Sunnyvale area, including the Cargill salt ponds, the mouth of Stevens Creek, and the Moffett Field wetlands and associated upland habitats. We want NASA to think of more livable, sustainable communities that improve the quality of life for humans and wildlife alike. Think of compact, walkable communities with small housing units.

49-1

Thank you.

Sincerely,
Peggy da Silva and Dan Hodapp

LETTER 49

Peggy da Silva and Dan Hodapp, January 21, 2002.

49-1: This letter is a condensed version of Letter 39. Please refer to responses to Letter 39.

X-Sent: 21 Jan 2002 03:13:54 GMT
From: "Susan Ford" <suford@peoplepc.com>
To: <researchpark@arc.nasa.gov>
Subject: Moffett Field
Date: Sun, 20 Jan 2002 19:16:59 -0800
X-Priority: 3 (Normal)
Importance: Normal

Dear Ms. Olliges:

Thank you for the opportunity to comment on the draft environmental impact statement (DEIS) for the proposed redevelopment at Moffett Field.

While I am not as well informed about the specific as I would like, I do feel that the Save the Bay organization has sound logic and motivation in theri position. So I support them and send their statement along to you as my input into the land use evaluation.

50-1

I encourage NASA to embrace the vision outlined herein and to create a redevelopment plan for Moffett Field that embraces a variety of land uses, including restored wetlands and improved habitat. South Bay residents deserve nothing less and our natural environment could use the help.

As a member of Save The Bay, I have learned that NASA has selected Alternative #5 as its preferred alternative. This concerns me because this alternative provides no buffer for the site's historic wetlands that lie with the proposed boundaries of the Don Edwards National Wildlife Refuge, exacerbates the region's chronic jobs-housing imbalance, and ignores the potential for significant onsite wetland restoration. NASA talks about planning for the future and becoming a world-class research center, but in my opinion, this plan is not world-class. It proposes a staggering amount of new office space with a modest amount of student housing in a region plagued by chronic housing shortages at all economic levels. This is a recipe for skyrocketing housing costs and traffic. It is not sustainable in the long run, and not what I want for my community. I envision a future that preserves our dwindling open space and natural resources, especially tidal wetlands along the Bay shoreline.

With respect to Alternative #5, I have four specific comments.
1) As a condition of approval for any development project at Moffett Field, NASA must clean up the site's contaminated historic wetlands and turn them over to the U.S. Fish & Wildlife Service. The stormwater ponds and the Eastern and Western diked marshes all lay within the proposed boundaries for the Don Edwards National Wildlife Refuge. No matter what development proposal is pursued, these historic wetlands must be remediated to levels sufficient to support tidal wetland restoration. Once remediation is complete, these lands should be turned over to the Service. This will allow the Service to incorporate these lands into the refuge and conduct much needed tidal wetland restoration. The Site 25 cleanup process must not preclude such activities.

50-2

2) Designate the Bay View parcel as a critical habitat buffer. Historically this parcel provided moist grasslands which supported seasonal swales and wetlands in wet years. These extremely productive habitats can sustain large numbers of shorebirds and waterfowl, particularly during migration periods. They are also increasingly rare habitats because they are often filled and built upon while tidal wetlands are preserved, as is the case here.

The Bay View parcel provides an ideal natural buffer between urban development at Moffett Field and wetlands in the diked marshes and beyond (slated for inclusion in the refuge). Providing adequate buffer zones is one of the Baylands Ecosystem Habitat Goals Report's most important goals for the Mountain View subregion. Protecting the entire parcel from development will increase species diversity and reduce human disturbance and predatorintrusion. Enhancing the existing seasonal wetlands on the parcel will also improve water quality by filtering site runoff and reducing siltation.

3) While the inclusion of housing in Alternative #5 is commendable, Bay View is the wrong place for it because substantial fill is required. In order to provide "short-term" student housing on the subsided Bay View parcel, NASA must place 220,000 cubic yards of fill on the site. This is equivalent to 17,000 dump trucks full of dirt. This fill is needed to raise the proposed Development above the floodplain. Placing housing in a floodplain is poor public policy, especially when it requires Bay fill. Save The Bay believes it is unacceptable, out-dated, and impractical to fill some of our last remaining baylands and related habitats, even if it will provide much needed housing. NASA should be proposing housing in a more appropriate upland location out of the floodplain.

50-2

4) NASA should strive to create a development plan that is as cutting edge as the research it hopes to conduct. The underutilized baylands at Moffett Field provide a significant opportunity for onsite wetland restoration that is being ignored. Save The Bay has long envisioned restoring a continuum of wetland habitats in the Mountain View/Sunnyvale area, including the Cargill salt ponds, the mouth of Stevens Creek, and the Moffett Field wetlands and associated upland habitats. This will provide critical habitat for endangered species and Pacific Flyway waterfowl, improve water quality, enhance biodiversity, and permanently protect open space. The vision also involves increased shoreline access and the creation of more livable, sustainable communities that improve the quality of life for humans and wildlife alike. Significant amounts of housing should be incorp-orated into the preferred alternative (although not placed on Bay View). This will decrease traffic congestion, improve air quality, help mitigate the jobs-housing imbalance, and reduce indirect impacts to the Bay.

Susan Ford
415.674.8973
suford@peoplepc.com

LETTER 50
Susan Ford, January 21, 2002.

50-1: This comment supports the comments presented by Save The Bay in Letters 31 and 39. Please refer to the responses to those letters. No further response is required.

50-2: The remainder of the letter contains points presented in Letter 39. Please refer to responses to Letter 39.

Ernest Goitein
167 Almendral Avenue
Atherton, CA 94027

January 21, 2002

Ms. Sandy Olliges
NASA/Ames Research Center
Environmental Services Office, MS 218-1
Moffett Field, CA 94035

Subject: Moffett Field Development Plans DEIS

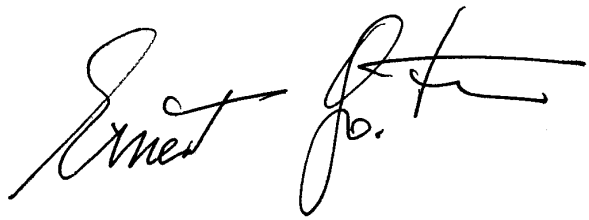
Dear Ms. Olliges:

I understand that NASA recommends Alternative 5 as it's preferred alternative. I believe this is not the best choice for the following reasons:

1) There is a need to provide a buffer between the wetlands of the Don Edwards National Wildlife Refuge and the proposed redevelopment.
2) The large amount of office space, with the current excess capacity of commercial buildings does not make sense.
3) The alternative 5 is growth inducing and will create further traffic congestion that is already at gridlock during commute hours. **51-1**
4) The diked marshes (both Eastern and Western), located within the proposed Wildlife Refuge, must be cleaned up, remediated and turned over to the Fish and Wildlife service, so that tidal action can be restored to these historic wetlands.
5) The Bay View parcel should be designated as a critical habitat buffer.
6) The DEIS does not address the International Bird Migration Treaty. The restoration of seasonal wetlands would provide habitat for these migrating flocks during the winter season. **51-2**
7) Housing proposed for the Bay View parcel would require large amounts of fill to bring the area above the flood plain. What would this do to impede run-off from the hillsides? **51-3**
8) Fill for the proposed Bay View parcel would require a huge fleet of dump trucks. Will NASA pay the local community for the road damage, air quality deterioration, and health effects from the dioxin contribution from the diesel exhaust? **51-4**
9) NASA should be required to set up a sufficiently large fund to cover health related consequences of this development or alternately demonstrate that the construction, traffic and use of the research facility will not affect the air quality of the adjacent communities. **51-5**

Per NEPA requirement these issues must be addressed before a final EIR can be approved or certified.

Cordially,



LETTER 51

Ernest Goiten, Atherton, January 21, 2002.

51-1: This comment summarizes points presented in Letter 39. Please refer to responses to Letter 39.

51-2: The Migratory Bird Treaty Act (MTBA) is described on page 3.9-5 of the EIS. The MTBA protects all migratory birds that occur at Ames Research Center. Land at NASA ARC currently provides habitat for migrating flocks and would continue to do so with the implementation of the NADP. NASA has added a bullet point to Mitigation Measure BIO-1 in this EIS. Construction activities would not be allowed to disturb nesting migratory birds.

51-3: Please see the response to Comment 21-31.

51-4: Please see the response to Comment 21-50 regarding additional traffic wear on roads. There is no specific evidence that dioxin is a particular toxic air contaminant related to diesel emissions. However, other toxic air emissions could be of concern, and have been considered in this EIS. Since truck trips would be temporary and sensitive receptors would not be located next to anticipated haul routes, significant impacts due to toxic air contaminants are not anticipated with the project. Typically, air quality analyses evaluate impacts for toxic air contaminants for permanent sources where persons are assumed to be exposed for many hours a day over many years. Given that the construction truck trips would only occur for a few hours per day for two to five years, long term exposure would not be an issue. Moreover, sensitive receptors are setback considerably from the haul routes. Finally, cleaner fuels and truck exhaust systems are expected to be implemented over the next decade, which will further reduce construction truck emissions.

51-5: Any claims for health-related consequences as a result of this development would be handled in accordance with applicable federal and State law.

Gordon Bennett
105 Sunset Way
Muir Beach, CA 94965

January 22, 2002

Ms. Sandy Olliges,
NASA/Ames Research Center,
Environmental Services Office,
Mail Stop 218-1, Moffett Field, CA 94035-1000

Dear Ms. Olliges:

Thank you for the opportunity to comment on the draft environmental impact statement (DEIS) for the proposed redevelopment at Moffett Field.

As a person interested and involved in wetland restorations, I am very concerned that NASA has selected Alternative #5 as its preferred alternative, since it significantly ignores the potential for critically important onsite wetland restoration.

NASA must clean up the contaminated historic wetlands, such as the stormwater ponds and the Eastern and Western diked marshes, which are within the proposed boundaries for the Don Edwards National Wildlife Refuge. As a condition of approval for any development project at Moffett Field, these historic wetlands must be remediated sufficently to be turned over to the Service for tidal wetland restoration. No cleanup process should preclude either restoration or inclusion in the Refuge.

52-1

Furthermore, the Bay View parcel should be designated as a critical habitat buffer between urban development at Moffett Field and wetlands slated for inclusion in the Refuge. Providing adequate buffer zones is one of the Baylands Ecosystem Habitat Goals Report's most important goals for the Mountain View subregion. NASA should also be proposing housing in a more appropriate upland location out of the floodplain and keep fill out of our last remaining baylands and related habitats.

In general, the underutilized baylands at Moffett Field provide a significant opportunity for onsite wetland restoration that is being ignored. There should be continuum of wetland habitats in the Mountain View/Sunnyvale area, including the Cargill salt ponds, the mouth of Stevens Creek, and the Moffett Field wetlands and associated upland habitats. This will provide critical habitat for endangered species, improve water quality, enhance biodiversity, and protect open space. I encourage NASA to embrace a broader vision for Moffett Field that celebrates restoring wetlands and improving habitat.

Sincerely,

Gordon Bennett

LETTER 52

Gordon Bennett, Muir Beach, January 22, 2002.

52-1: This letter presents several comments presented in Letter 39. No new comments are presented. Please refer to responses to Letter 39.

From: "Richard H. Scholz" <richs@worldnet.att.net>
To: <Researchpark@mail.arc.nasa.gov>
Subject: CASC, Attention D: 204-2
Date: Tue, 22 Jan 2002 17:32:10 -0800
X-Priority: 3 (Normal)
Importance: Normal

Attention D:204-2
Dear Ms. Morrissey,
Thank you for your letter of January 4th to Friends of the CASC. The new Air and Space Center will add greatly to the prestige of this area, as well as being a real treat to visit. I also am very interested in keeping the Airfield open, since it allows future air projects as well as being very important to the Air National Guard, Lockheed, and various other current uses.
Regarding the Center, I can remember as a very young child my dad taking me and one of my brothers into the main hanger to see the airplanes...They were Army Air Corps planes then, as this was before the Navy took Moffett back with the start of WWII. The Center will keep the history alive as well as provide for the future. I applaud your efforts...Keep up the good work.

53-1

Rich Scholz
Friend of the CASC

LETTER 53

Rich Scholz, January 22, 2002.

53-1: This comment supports and applauds components of the proposed project. No response is required.

From: "nancy barnby" <nbarnby@jps.net>
To: <researchpark@arc.nasa.gov>
Subject: Moffet Field Development Possibility
Date: Wed, 23 Jan 2002 18:49:07 -0800
X-Priority: 3

Dear Ms. Olliges,

I am excited to learn that there is a possibility that the NASA facilities at Moffet Field might be "swept away" so that the baylands there could be restored. Surely it is a tragedy that so much of the shoreline along San Francisco Bay is taken up by airports, ballparks, and other development. We have managed to save some wonderful areas, such as the Palo Alto Baylands, Coyote Point, and so forth, but the more land we can save in pristine (or restored "pristine") form for future generations, the better. As Edmund O. Wilson points out, we need to keep diverse systems alive in our world in order that we ourselves survive.

54-1

Sincerely, Nancy Barnby
Menlo Park

LETTER 54

Nancy Barnby, Menlo Park, January 23, 2002.

54-1: This is not a comment on the adequacy of the DPEIS; therefore, no response is required.

X-Server-Uuid: d6ddd4b6-ef0b-4485-8736-a314bd30aabc
Conversion: Allowed
Priority: normal
Disclose-Recipients: Prohibited
Alternate-Recipient: Allowed
Date: 23 Jan 2002 10:14:55 -0800
From: "Milt Schwartz" <Milt.Schwartz@nsc.com>
To: researchpark <researchpark@arc.nasa.gov>
Subject: save the bay
X-WSS-ID: 105022F212160-26-01

1/23/2002

Dear Ms. Olliges:

I have learned that NASA has selected Alternative #5 as its preferred alternative.

Alternative #5 worsens the region's jobs-housing imbalance,
and ignores the potential for significant onsite wetland restoration.

In my opinion, this plan is not world-class. It proposes a huge amount of new office space with a modest amount of student housing in a region that has housing shortages at all economic levels.
This is a recipe for increased traffic and housing costs.
This is not what I want for my community.
I believe strongly to preserve our open space and natural resources.

Here are some thoughts:

55-1

1)NASA must clean up the site's contaminated historic wetlands and turn them over to the U.S. Fish & Wildlife Service.
The stormwater ponds and the Eastern and Western marshes all lay within the proposed boundaries for the Don Edwards National Wildlife Refuge. No matter what development proposal is pursued, these historic wetlands must be remediated to levels sufficient to support tidal wetland restoration. Then, these lands should be turned over to the U.S. Fish & Wildlife Service.

2) Designate the Bay View parcel as a critical habitat buffer.
Historically this parcel provided moist grasslands which supported seasonal swales and wetlands in wet years. These habitats can sustain large numbers of shorebirds and waterfowl, particularly during migration periods. Just take a look at the birds and other wildlife at Shoreline Park

Placing housing in a floodplain is a bad idea.
In my opinion, it is not a good idea to fill some of our
last remaining baylands and related habitats, even if it will
provide much needed housing.
NASA should be proposing housing in a location out of the floodplain.

55-1

I play golf at Shoreline Park.
I sure would like to see more public golf courses in this area.
Many wildlife creatures inhabit the present Shoreline golf course and it
attracts a lot of migrating birds, which makes for an enjoyable round of golf.
The Shoreline area is a great escape from city and car noise.

55-2

regards, milt schwartz

Milt Schwartz
423 Hedgerow Ct
Mtn. View, CA 94041

email: schwartz@nsc.com

LETTER 55

Milt Schwartz, Mountain View, January 23, 2002.

55-1: This comment is a rewording of points presented in Letter 39. No new points are presented. Please refer to responses to Letter 39.

55-2: The commentor is expressing his opinion in favor of additional golf courses in the project vicinity. This is not a comment on the EIS. No response is required.

Date: Thu, 24 Jan 2002 23:15:51 -0800
From: Bob <bbobsc@mindspring.com>
X-Accept-Language: en
To: researchpark@arc.nasa.gov
Subject: Moffett Plan-Editoral

I just read the editoral of Lenny Siegel and once again feel here is an example of a voice of protest against progress. Moffett is an ideal location for a science research center. Why the local resident sees this as a negative can only be catorgized as selfish. He reminds me of the calls we used to get about the airplane noise and the person who called bought their house knowing there was an airfield there! Why doesn't Lenny move to Nevada or Idaho if he is so concern about traffic! I support the plan and all that it brings..

56-1

George R Bartleson
USN Retired

LETTER 56

George Bartleson, January 24, 2002.

56-1: This comment expresses an opinion in favor of the project and in opposition to an editorial written about the proposed project. No response is required.

Robert L. Erdman
875 Radcliff Court
Sunnyvale, CA 94087

January 24, 2002

Sandy Olliges
NASA Ames Research Center
Environmental Services Office, M.S. 218-1
Moffett Field, CA 94035

Traffic in the Bay Area currently exceeds the capacity to handle it, California highway conditions are rated lowest in the US, East Palo Alto rejected IKEA because of traffic and Mountain View rejected Home Depot because of traffic. Now NASA is considering a major expansion without adequate traffic planning. There are several options to solve this problem that should be considered as an essential part of the project. One possible approach is to build an access road around the bay end of the runway. Yes, it would be expensive but traffic congestion is also expensive. 57-1

I believe the development will be good for the area but all environmental issues need to be addressed and resolved even if they increase the project cost.

Sincerely,

R. L. Erdman

LETTER 57

Robert Erdman, Sunnyvale, January 24, 2002.

57-1: The traffic impacts of the project are addressed in detail in Section 4.3 of this EIS. The NASA Ames Development Plan includes aggressive measures to mitigate the projected traffic demand. Those measures include 1,930 new housing units for the use of on-site employees and students in the Preferred Alternative (Mitigated Alternative 5) and a traffic demand management plan that would reduce the number of single-occupant vehicle trips by at least 22 percent. On-site housing would reduce trips by another 33 percent, resulting in a total trip reduction of 55 percent. Those measures are more ambitious than any other recent development in the South Bay.

X-Sender: liebmann@mail.redshift.com
Date: Thu, 24 Jan 2002 12:48:36 -0800
To: researchpark@arc.nasa.gov
From: Hannah Liebmann <liebmann@redshift.com>
Subject: Proposed NASA Ames Research Center

Dear Sandy Olliges:

We the undersigned, Bernadine Frank and Hannah Liebmann, express our strong disapproval of the proposed NASA Ames Research Center for the following reasons: 58-1

1. The quality of life of the residents of Mountain View and neighboring cities will be severely worsened by the increased congestion of streets and freeways, already jammed beyond capacity during ever extending rush hours. Shuttle buses and bike lanes, although mitigating the traffic congestion, will not prevent the majority of the 9,000 new workers to use our roadways. 58-2

2. This increase in gasoline-burning vehicles will add to the already high pollution of the air, as evidenced, among other problems, by the high incident of asthma among children in Santa Clara County. 58-3

3. The southern end of the San Francisco Bay is the only piece of land in our neighborhood not yet completely destroyed by human activities and enterprises.
Only recently have there been efforts to reverse the enormous damage inflicted upon the San Francisco Bay's natural environment. Instead of preserving or even improving the habitat for wildlife of the bay, the proposed project would destroy uplands habitat adjacent to Moffett's wetlands. 58-4
In addition, any landfill of the San Francisco Bay makes it more prone to severe earthquake damage. 58-5

We urge you to heed the environmental impact statement, required by law, that this project would have "significant and unavoidable impacts." We do not understand why you, a federal agency, is above the law which binds the rest of the population. If you don't comply, we will ask our elected representatives to intervene on our behalf. 58-6

Sincerely,

Bernadine Frank, 650-961-3485
Hannah Liebmann, 650-386-8118
215 Thompson Square
Mountain View, CA 94043-4218

LETTER 58

Bernadine Frank and Hannah Liebmann, Mountain View, January 24, 2002.

58-1: This comment expresses disapproval of the proposed project. No response is required.

58-2: This comment expresses concern about traffic from the project. The traffic impacts of the project are addressed in detail in Section 4.3 of this EIS, which acknowledges a significant traffic impact on nearby freeway segments. The Preferred Alternative, Mitigated Alternative 5, results in 7,088 new workers, not 9,000.

58-3: Air quality impacts of the project are addressed in detail in Section 4.4 of this EIS, which acknowledges a significant impact to air quality.

58-4: Conservation areas are a key component of the proposed plan. There is no fill proposed for the San Francisco Bay under the NADP. Please see also response to Comment 21-31.

58-5: Geotechnical and seismic impacts of the project are addressed in detail in Section 4.8 of this EIS. All fill would be engineered to minimize seismic safety issues.

58-6: Under NEPA, a project can be implemented despite an EIS finding that there would be significant, unavoidable impacts. Although the EIS found that the project would have several significant impacts, mitigation measures have been developed to reduce most impacts to less-than-significant levels. The traffic impacts of the project are addressed in detail in Section 4.3 of this EIS. The project would also have positive impacts that could be found to outweigh the significant and unavoidable impacts.

From: Elizaharp2@aol.com
Date: Thu, 24 Jan 2002 16:18:33 EST
Subject: Development
To: researchpark@arc.nasa.gov

Dear Mr/Ms Olliges:

Today's (Jan 24) piece in the Merc, "Moffett park will hurt quality of life unless residents start shouting now," is food for thought. What's wrong with it? At the very least it would seem that even NASA ought to consider environmental impact, but I'd like to hear the other side. Maybe the research park is the best we can hope for; or perhaps the project should include more housing, with preference for those who work there.

59-1

59-2

LETTER 59

Elizaharp2@aol.com, January 24, 2002.

59-1: NASA has extensively considered the environmental impact of the NADP through this EIS.

59-2: Please see the response to Comment 14-27.

Date: Thu, 24 Jan 2002 20:14:59 -0800
From: "Joey L." <jdblplay@pacbell.net>
Subject: Comments on Draft EIS
To: researchpark@mail.arc.nasa.gov
X-Priority: 3

With regards to the notice you sent out about the Draft EIS, that I have not had the opportunity to review and don't know if the following would be appropriate.
However, in the spirit of the Air/Space Theme, how about including in the Development Plan a Model Air Park? To be used for all classes of model aircraft and possibly smaller classes of model rockets. Perhaps located in the area of the golf course (N.East).
Insurance coverage through AMA. Sponsored by a conglomerate including local cities, clubs, model industry and perhaps industry such as Lockheed.
I would also like to see the availability of one of the Blimp Hangers (or half a hanger) for indoor flying models (rubber/electric powered). Perhaps once every two weeks or once a month. The overhead lighting cables would have to be removed.
If any of this would work out, there possibly could be the consideration of enticing a major U.S. or World Competition event. With the use of the runway concourse for events and available housing for competitors.
Respectfully,

60-1

Please address response to:
Ronald J Lambert
450 Roading Drive
San Jose, CA 95123

jpl

LETTER 60

Ronald Lambert, San Jose, January 24, 2002.

60-1: This comment expresses support for establishment of a Model Air Park at ARC. Such a Model Air Park is not part of the project. No response is required.

Date: Thu, 24 Jan 2002 15:07:12 -0800
To: Sandra M Olliges <solliges@mail.arc.nasa.gov>
From: George Raiche <graiche@mail.arc.nasa.gov>
Subject: NRP draft EIS--comment

Hello;

I attended one of the on-base employee briefings for the draft of the NRP Development Plan EIS. I wish to strongly oppose any development of the Bay View parcel. Developing this parcel would substantially reduce open space, disrupt bird habitat, and have a minimum impact on local traffic issuses. 61-1

Aesthetically, loss of the Bay View parcel to development would deprive both NASA and local residents of one of the few remaining open vistas along the Bayshore. Many NASA on-site personnel visit these spaces daily and enjoy the views and quiet, and the adjacent Stevens Creek Trail is also heavily used for recreation. Housing developments in this area would destroy the open space that we wish to enjoy. The existence of open space is a quality of life issue. 61-2

Regarding bird habitat, it is stated in the EIS that the impact to endangered species would be insignificant. This is debatable, as Peregrine Falcons, listed as endangered by the state of California, are frequent spring and autumn visitors. They hunt birds and rodents that live in the Bay View habitat now. Removing their food source will certainly impact their health. Additionally, I regularly see Cooper's Hawks, Northern Harriers, and White-tailed Kites year-round in the Bay View and adjacent areas. Each of these species is listed as California Species of Special Concern. The primary cause of their CSC status is loss of habitat--exactly the habitat that Bay View development would destroy. 61-3 Further, a large number of NRP residents will be college students. I taught at a residential college for several years before coming to NASA, and I can tell you that college students always bring two things--cars and pets. They'll bring the cars for the reasons discussed below. They bring pets--dogs and cats--and no amount of rule-making will stop them. Cats have a well-known disruptive effect on native animals. 61-4

I realize that housing for Bay View is designed to reduce the traffic and pollution impact on the surrounding community. However, it is not obvious to me that housing NRP participants on base will reduce their impact, because each of them will bring a car with them. They'll need to, because the Bay View parcel is a very long (30+ minute) walk from the "business" areas of the NRP on the former Navy campus. A simple bus system is incapable of transporting the numbers anticipated in the narrow traffic times that traditional schedules dictate. NRP residents will also use their cars to visit nearby businesses, cultural and educational institutions, and other local sites that enhance the attractiveness of locating to the NRP.

The vast majority of current NASA on-site workers drive to work now, even with effective public transit options (which I use daily). Many NASA employees drive off site daily for lunch, or between diffent buildings on errands. It's not obvious to me that a few thousand NRP residents won't be just as likely to hop in their cars to attend work functions or to visit Mountain View and other destinations--perhaps nearby open spaces. This will burden traffic and air cleanliness regardless of whether NRP residents live on site or off. In fact, short car trips generate disproportionately large amounts of air pollutants because the cold engines burn fuel inefficiently. It makes very little sense to destroy the Bay View habitat for a housing development that will not solve traffic or environmental problems. If NRP residents absolutely must live on site, why not locate the housing on the already developed areas of the base? At least then they could walk to their destinations, and use (existing!) light rail to travel to Mountain View or San Jose. That might actually reduce the traffic and air pollution burden. 61-5

In short, the questionable benefit of housing NRP residents on the Bay View parcel is vastly outweighed by the substantial loss of open space, loss of habitat for California Species of Special Concern, and gain of many hundreds of daily on-site car trips. I strongly oppose any plan that requires development of the Bay View parcel. 61-5

Thank you.
George Raiche

--
George A. Raiche, Ph.D.
Reacting Flow Environments Branch, ASA
NASA-Ames Research Center
MS 230-2
Moffett Field CA 94035
(650) 604-1983 (v)
(650) 604-0350 (f)

LETTER 61
George Raiche, January 24, 2002.

61-1: This is an introductory comment that summarizes the points in the rest of the letter. Each point is addressed in detail below. No further response is required.

61-2: NASA looked at alternative ways to include housing in the NADP without developing Bay View. But as described in response to Comment 21-14, development at the north end of the Ames Research Center was required since there are limited sites available that are appropriate for housing. However, NASA has addressed the importance of leaving open space and views in Bay View. As a result, only 11 hectares (28 acres) of the 39 hectares (96 acres) are proposed for housing and support facilities. The remaining acres are for open space, burrowing owl habitat, buffer space for the wetlands, and recreational fields. In addition, view corridors will be maintained through careful design.

61-3: Impacts to foraging areas for raptors (peregrine falcon, Cooper's Hawks, Northern Harriers, and white-tailed kites) are discussed on pages 4.9-5 and 4.9-14 of Section 4.9 of this EIS. Please see the response to Comment 8-2.

61-4: Cars and feral cats already occur near sensitive habitats at Ames Research Center. However, the mitigation measures associated with impacts BIO-4, 6, and 15 would prevent further impact to sensitive species by providing measures to prohibit cats in new housing, prohibiting the feeding of wildlife, instituting the use of trash containers that cannot be opened by wildlife, instituting a public education program to teach the importance of excluding non-native predators from Ames Research Center, and augmenting the on-going efforts to control non-native predators in conjunction with USFWS. Any pets found in the wetlands or open space areas of the Bay View

would be trapped and taken to animal shelters. Residents responsible would be evicted from on-site housing.

61-5: The NADP Transportation Demand Management Plan is designed to create an environment where it is easy to give up driving one's car to lunch and across campus. Parking would be limited and a shuttle and bike path network would be available for easy transit from one side of the base to the other, as well as to public transportation hubs or downtown Mountain View.

Housing has been located as close to existing transit hubs as the site will allow. Additional student housing would be located in Shenandoah Plaza in Buildings 19 and 20 and in NRP Parcel 6. These are the only other sites on Center where it is appropriate to house residents. NASA will continue to work with DOD to obtain the military housing for NASA's use. NASA will also continue to evaluate placing additional housing in the NRP, for example over retail business on the site as remediation proceeds. Please see also response to Comment 21-14.

X-Sender: samemeht@fargo.cisco.com
Date: Thu, 24 Jan 2002 16:39:13 -0800
To: researchpark@arc.nasa.gov
From: Sameet Mehta <sameet@cisco.com>
Subject: lenny seigel's article

Lenny's article is way way off base! I drive through that area every day. I don't mind a little more traffic to increase jobs! In fact, people will take the train more often. Please, do NOT listen to Lenny. 62-1
Sameet Mehta
Cisco Systems

LETTER 62

Sameet Mehta, Cisco Systems, January 24, 2002.

62-1: This comment states an opinion about an article written about the proposed project. No response is required.

To: researchpark@arc.nasa.gov
Date: Fri, 25 Jan 2002 08:34:09 -0800
Subject: wetlands
X-Juno-Line-Breaks: 4-5
From: Norton W Bell <nwbell@juno.com>

Please revise plans for housing in the research park at Moffett Field to eliminate the housing that is on land that is historic wetlands. Also, please work to restore these wetland to tidal flow so that they can replace the thousands of acres of wetlands surrounding San Francisco Bay that have been lost.

63-1

Norton Bell, retired engineer, Hewlett Packard

LETTER 63
Norton Bell, January 25, 2002.

63-1: Please see the responses to Comments 27-6, 27-7 and 39-3.

January 25, 2002

Sandy Olliges
NASA Ames Research Center Environmental
Services Office
M.S. 218-1
Moffett Field, CA 94035

Dear Ms. Olliges:

As a long time Mountain View resident, I would like to add my comments on the proposed Ames Development Plan.

Although the proposed plan by NASA is admirable in some respects, there are a number of questionable issues that come to mind which would have a very serious impact on the city of Mountain View and its residents. Additional jobs are always welcome but they must be accompanied by the ability to house the workers. As we know housing is presently in very short supply and is causing many of our civil servants and other city employees great hardships which I do not want to see visited on new employees. 64-1

The inability to purchase local housing due to the inflated home prices is of great concern and I would hesitate to endorse any development that would make housing availability even worse.

Traffic volume is already overburening our streets and freeways and due consideration should be given to the amount of stress our infrastructure can sustain. 64-2

I would hope NASA-Ames will give much more thought to the proposed development in view of the damaging effects it may offer. Many questions need to be answered and more effective solutions created by NASA to the vexing problems this development is spawning. 64-3

Sincerely,

Maxine L. Eggerth

Maxine L. Eggerth

CC: Roy Hayter, Chair Advocates for Affordable Housing
Lenny Siegel, Public Environmental Oversight Center
Mountain View City Council

LETTER 64
Maxine Eggerth, January 25, 2002.

64-1: Please see the response to Comment 14-27.

64-2: Traffic impacts of the project are discussed extensively in Section 4.3 of this EIS. The Preferred Alternative would cause no impacts on local streets. Significant unavoidable impacts on freeways would occur. NASA has committed to implementing a TDM program to partially mitigate this impact. Further lessening of impacts on the freeways would occur as a result of the additional housing proposed for Mitigated Alternative 5.

64-3: This is a concluding comment that adds no additional information. No response is required.

From: Andrew Fenselau <fenselau@sgi.com>
To: "'Researchpark@arc.nasa.gov'" <Researchpark@arc.nasa.gov>
Cc: "'sally@sallylieber.org'" <sally@sallylieber.org>,
"'mkazperzak@mediates.com'" <mkazperzak@mediates.com>
Subject: Public Comment on Moffett DEIS
Date: Fri, 25 Jan 2002 11:55:42 -0800

Ms. Sandy Olliges
NASA/Ames Research Center
Environmental Services Office

CC: Sally Lieber, Mountain View City Council
Mike Kasperzak, Mountain View City Council

January 25, 2002

Dear Ms. Olliges:

Thank you for the opportunity to comment on the draft environmental impact statement (DEIS) for the proposed redevelopment at Moffett Field. As a Mountain View resident, employee of SGI, and member of Acterra, I have learned that NASA has selected Alternative #5 as its preferred alternative. This concerns me because this alternative provides no buffer for the site's historic wetlands that lie with the proposed boundaries of the Don Edwards National Wildlife Refuge, exacerbates the region's chronic jobs-housing imbalance, and ignores the potential for significant onsite wetland restoration. NASA talks about planning for the future and becoming a world-class research center, but in my opinion, this plan is not world-class. It proposes a staggering amount of new office space with a modest amount of student housing in a region plagued by chronic housing shortages at all economic levels. This is a recipe for skyrocketing housing costs and traffic. It is not sustainable in the long run, and not what I want for my children as they grow up in this community. I hope for a future that preserves our dwindling open space and natural resources, especially tidal wetlands along the Bay shoreline.

With respect to Alternative #5, I have four specific suggestions.

65-1

1) As a condition of approval for any development project at Moffett Field, NASA should clean up the site's contaminated historic wetlands and turn them over to the U.S. Fish & Wildlife Service. The stormwater ponds and the Eastern and Western diked marshes all lay within the proposed boundaries for the Don Edwards National Wildlife Refuge. No matter what development proposal is pursued, these historic wetlands must be remediated to levels sufficient to support tidal wetland restoration. Once remediation is complete, these lands should be turned over to the Service. This will allow the Service to incorporate these lands into the refuge and conduct much needed tidal wetland restoration. The Site 25 cleanup process must not preclude such activities.

2) Designate the Bay View parcel as a critical habitat buffer. Historically this parcel provided moist grasslands which supported seasonal swales and wetlands in wet years. These extremely productive habitats can sustain large numbers of shorebirds and waterfowl, particularly during migration periods. They are also increasingly rare habitats because they are often filled and built upon while tidal wetlands are preserved, as is the case here.

The Bay View parcel provides an ideal natural buffer between urban development at Moffett Field and wetlands in the diked marshes and beyond (slated for inclusion in the refuge). Providing adequate buffer zones is one of the Baylands Ecosystem Habitat Goals Report's most important goals for the Mountain View subregion. Protecting the entire parcel from development will increase species diversity and reduce human disturbance and predator intrusion. Enhancing the existing seasonal wetlands on the parcel will also improve water quality by filtering site runoff and reducing siltation.

3) While the inclusion of housing in Alternative #5 is commendable, Bay View is the wrong place for it because substantial fill is required. In order to provide "short-term" student housing on the subsided Bay View parcel, NASA must place 220,000 cubic yards of fill on the site. This is equivalent to 17,000 dump trucks full of dirt. This fill is needed to raise the proposed development above the floodplain. Placing housing in a floodplain is poor public policy, especially when it requires Bay fill. Save The Bay believes it is unacceptable, out-dated, and impractical to fill some of our last remaining baylands and related habitats, even if it will provide much needed housing. NASA should be proposing housing in a more appropriate upland location out of the floodplain.

65-1

4) NASA should strive to create a development plan that is as cutting edge as the research it hopes to conduct. The underutilized baylands at Moffett Field provide a significant opportunity for onsite wetland restoration that is being ignored. Save The Bay has long envisioned restoring a continuum of wetland habitats in the Mountain View/Sunnyvale area, including the Cargill salt ponds, the mouth of Stevens Creek, and the Moffett Field wetlands and associated upland habitats. This will provide critical habitat for endangered species and Pacific Flyway waterfowl, improve water quality, enhance biodiversity, and permanently protect open space. The vision also involves increased shoreline access and the creation of more livable, sustainable communities that improve the quality of life for humans and wildlife alike. Significant amounts of housing should be incorp-orated into the preferred alternative (although not placed on Bay View). This will decrease traffic congestion, improve air quality, help mitigate the jobs-housing imbalance, and reduce indirect impacts to the Bay.

As a neighbor and optimistic human, I encourage NASA to incorporate these changes and to develop a redevelopment plan for Moffett Field that embraces a variety of land uses, including restored wetlands and improved habitat. We South Bay residents, and our children and grandchildren, deserve nothing less.

Sincerely,
Andrew Fenselau
2091 San Luis Ave #1
Mountain View, CA 94043
650-390-9712

LETTER 65

Andrew Fenselau, Mountain View, January 25, 2002.

65-1: This comment is a rewording of points presented Letter 39. Please refer to responses to Letter 39.

Date: Fri, 25 Jan 2002 17:09:57 -0800
To: researchpark@mail.arc.nasa.gov
From: Kevin Jackson <kjackson@mail.arc.nasa.gov>
Subject: Comments on EIS
Cc: solliges@mail.arc.nasa.gov, jquanz@mail.arc.nasa.gov

To whom it may concern:

Please include these comments in the responses to the draft EIR. Thank you.

I am very interested in making sure that the bicycle element of the TDM plan is implemented effectively. For this to happen, it is absolutely essential that two principles be understood. In my experience, they almost never are. These principles are:

1) The bicycle facilities must be designed and built properly. Getting them "mostly right" is hardly any good at all; people take it for granted that driving a car will be made as safe and convenient as possible, and that is the standard which potential cyclists will use in deciding whether it makes sense for them to ride a bicycle. Doing the job 90 percent right does not mean you will get 90 percent of the projected number of cyclists. Rather, it means that virtually all potential cyclists will decide "that's not good enough, I'm sticking with my car."

2) The only way to get the job done right is to make sure that the people in charge have specific expertise in bicycle facilities engineering. Selecting qualified people is not as easy as it sounds, however, since every traffic engineer and roadway contractor whose experience is limited to automobile accommodation will tell you that they are capable of providing safe bicycle facilities. It is quite likely that they sincerely believe this, but they are wrong!!! One possible way to resolve this dilemma is to require that the people in charge be professionals with experience accommodating bicycles on streets per the current AASHTO and Caltrans manuals, specifically:

à AASHTO "Guide for the Design of Bicycle Facilities" (1999)
à Caltrans "Highway Design Manual" Chapter 1000

66-1

Several of the surrounding communities have had bicycle plans developed by consulting firms and can provide references to people who are qualified to do this work.

In addition to these principles, I have several specific suggestions:

1) There are many references to "bike paths" in the EIS, the Design Guide, and the Development Plan. There are two aspects of separated paths which are routinely overlooked. First, the expected safety benefit of segregating cyclists from motorized traffic is all too often outweighed by the increased danger at roadway crossings, where motorists are far less vigilant for cross traffic than they are at normal intersections. These paths must be designed extremely carefully by people who really know what they are doing! Second, regardless of what you call them, they will in fact be "multi-use" paths. These facilities are very attractive to strollers, joggers, skaters, dog-walkers, etc. so that cyclists must constantly slow to pedestrian speeds. This means they are fine for recreation, but not very useful for transportation - and they are certainly no substitute for safe bike accommodation on ALL roadways.

2) The Design Guide shows many examples of bike lanes with a car lane on each side (through lane on the left, and dedicated right turn lane on the right). The transition areas are not shown, however, and this is another issue which requires great care to implement safely, especially in the case of high-speed freeway ramps. Also, all of the diagrams show bike lanes in the through direction only; cyclists turning left will have to cross one or more car lanes, and it is not at all clear that any thought was given to making sure this can be done safely (considering sight lines, lane widths, speed and volume of traffic, etc.). 66-1

3) Policies for safe accommodation of bicycle traffic in construction zones must be established and enforced. In addition to the long build-out period envisioned for the research park, ongoing activities such as utility maintenance invariably affect "bike space" on the roadway, but this problem will be ignored by contractors if they are allowed to do so and the roads will be unusable by cyclists for extended periods. 66-2

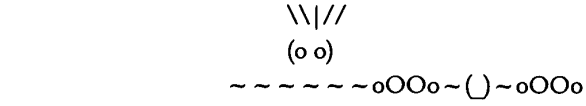
4) The wide, straight roadways which are planned in order to protect "view corridors" must incorporate effective traffic calming features in order to deter speeding. In areas with on-street parking, the bike lanes must be designed to keep cyclists out of the "door zone", even for wide and/or poorly parked vehicles. 66-3

5) A high-profile education component aimed at instructing ALL roadway users on how to share the streets safely would help to overcome one of the biggest obstacles to greater bicycle use. This is very important even if the facilities are built properly, but even more so if they are not (e.g., if adequate lane widths are not provided in the historical district). The Moffett Field Traffic Safety Committee and Protective Services Office should have input in setting up and administering such a program. 66-4

6) Continue to consult with the surrounding communities in order to take advantage of their experience with providing bicycle accommodation on roadways. This cooperation should be mutually supportive, with NASA officials endorsing enhancements in the regional bikeway infrastructure which provide better access to the center, such as freeway overpass improvements on Moffett Boulevard, the Borregas Avenue bike/pedestrian bridges in Sunnyvale, and completion of the Bay Trail. Form a committee of bicycle users on the center which will review plans at each stage of development and coordinate with the VTA, Mountain View, and Sunnyvale bike committees. 66-5

7) To the extent possible, extend the provisions of the TDM plan to include existing center facilities in order to achieve the maximum overall automobile trip reduction effectiveness. 66-6

Kevin
O: (650) 604-6126
H: (408) 245-8784



"Work to Eat;
Eat to Live;
Live to Bike;
Bike to Work!"

LETTER 66
Kevin Jackson, January 25, 2002.

66-1: One of the design goals of the NRP is to create a campus-like atmosphere that reduces vehicle traffic throughout the development and encourages pedestrian and bicycle transportation. To achieve this goal, a network of effective and safe pedestrian and bicycle routes would be required, and great attention has been paid to providing such a network. As stated in Appendix B of the DPEIS, all bicycle guidelines in the NRP TDM Program meet the requirements of VTA's bicycle technical guidelines. While there may be some cross-utilization by pedestrians and cyclists of some of the pathways through areas of the NRP, the TDM Program and Design Guidelines do call for separate routes for pedestrians and bicyclists. Primary bicycle access would be provided via Class II bicycle lanes along all streets within the NRP.

The design guidelines include the examples mentioned by the commentor with the intent of showing that bicycle lanes would be designated to ensure the safe through-travel of bikes at intersections where right-turn lanes exist. For on-street facilities, left-turns made by bicyclists would be made from left-turn lanes as they are on City and County streets (i.e., bicyclists and vehicles would share the road). The design guidelines are not intended to be a fully developed NRP bicycle plan. The intent of the design guidelines is to show that priority treatment shall be given to vehicle and bicycle movements at intersections, but does not highlight all possible intersection striping configurations. No bicycle priority is envisioned unless certain cases warrant special control (e.g. a separate crossing phase at a high vehicle traffic location). The NRP TDM plan discusses the development of the bicycle path/lane network and refers to the expertise needed to create a well-designed bicycle network as well as the need to plan for bicycle turning movements at intersections.

66-2: As part of the standard NASA procedures, contractors would submit safety plans that describe how they would safely accommodate pedestrian, bicycle and vehicle traffic during construction.

66-3: View corridors will be maintained within the NRP by strategically placing buildings within the site, and by providing setbacks of the buildings from the roadways. These setbacks will provide generous sidewalks for pedestrians along the street-fronts and 6-8 feet of landscape buffer between the sidewalks and the road, and will help preserve the architectural character of the new community.

There will be no street parking on major roadways leading into or out of the NRP. The goal is for most vehicles to park within the outskirts of the development, and street parking does not begin until after the mid-point of entry where most cars are expected to have left the roads, and overall vehicle traffic is reduced. Where street parking is provided, an 8' wide allowance between the sidewalk and the traffic lanes is planned.

"Traffic-calming" will occur through appropriate traffic-engineering measures that ensure that vehicle speeds are consistent with the bicycle and pedestrian friendly goals of the NRP. For example, the number of road lanes and lane widths would be smaller in inner portions of the NRP than on the major roadways leading into the area.

66-4: The TDM Program states that the Transportation Management Association (TMA) would conduct extensive marketing and education programs to encourage the use of alternative transportation to the NRP, including the use of bicycles. One element of the TDM Program would be a bicycle promotion program (Section 4.2.5 of Appendix B) that is specifically intended to create a bicycle culture within the NRP.

66-5: Please see the response to Comment 13-3.

66-6: The NRP TDM Program and the CUP EA TDM Program apply only to those land uses that are in the NRP and Bay View areas. It would not apply to the existing Ames Campus. However, NASA already has an extensive TDM program on the existing Ames Campus which encourages bicycle use on-site and alternatives to single-occupancy vehicles.

Eileen Menteer
2503 Devri Ct
Mountain View, CA 94043-4109

94035/9999

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Ms. Sandy Olliges
NASA / Ames Research Ctr
Environmental Services Ofc.
Mail Stop 218-1
Moffett Field, CA
94035-1000

1-25-02

Dear Ms. Olliges,

Altho I do not believe that wetlands can ever be "restored," still, in 30 years the condition of the surrounding land could be improved with more wetlands. If there's a chance to increase the life-giving, cleaning effects of those boundaries between oceans & the land, I'm all for it. 67-1

I'm also concerned with the toxicity which the Navy left on the land which used to belong to the Ohlones. It's sad and scary.

Sincerely yours,
Eileen Menteer

LETTER 67

Eileen Menteer, Mountain View, January 25, 2002.

67-1: Wetland restoration is not within the scope of this project. The Navy is remediating their contamination through their Installation Restoration Program under the oversight of US EPA and the California Regional Water Quality Control Board. The Navy's remediation program is not within the scope of this project.

From: Joe_Altimus@notes.rlg.org
Subject: comments on Moffet Field draft environmental impact statement
To: researchpark@arc.nasa.gov
Cc: sally@sallylieber.org, rfaravelli@aol.com, mkasperzak@mediates.com, mpear@mattpear.com, rosemary@stasek.com, mlzoglin@aol.com
Date: Mon, 28 Jan 2002 11:19:23 -0800

January 28, 2002

Dear Ms. Olliges:

Thank you for the opportunity to comment on the draft environmental impact statement for the proposed redevelopment at Moffett Field. I have learned from Save the Bay that NASA has selected Alternative #5 as its preferred alternative. This concerns me because that alternative

- provides no buffer for the site's historic wetlands that are in the proposed boundaries of the Don Edwards National Wildlife Refuge

- contributes to the region's chronic jobs/housing imbalance

- ignores the opportunity to restore significant wetlands in the site

68-1

A better alternative is one that would preserve our dwindling open space and natural resources, especially tidal wetlands along the Bay shoreline. NASA should clean up all the site's contaminated historic wetlands and then turn them over to the U.S. Fish & Wildlife Service.

One of my favorite activities is bird watching and hiking along the south San Francisco Bay area. The redevelopment of Moffett Field is an opportunity to restore a wetland area of great importance for migrating birds; that opportunity should not be lost.

Sincerely,

Joe Altimus
(joe_altimus@notes.rlg.org)

LETTER 68

Joe Altimus, January 28, 2002, 2002.

68-1: This letter summarizes several points that are presented in Letter 39. Please refer to responses to comments in Letter 39.

X-Sent: 28 Jan 2002 13:47:23 GMT
Date: Mon, 28 Jan 2002 08:47:58 EDT
From: "Murzelle" <murzelle@mymailstation.com>
To: Researchpark@arc.nasa.gov
Subject: Moffett Field DEIS comment

Ms. Olliges:
Several aspects of the DEIS and the preferred Alternative #5 concern me:

The plans for the Bay View parcel seem inappropriate, particularly the intention to dump huge amounts of fill in the parcel and then build short-term student housing there. Bay View, as seasonal wetlands, has provided valuable habitat for waterfowl and shorebirds. This is the best continued use of this parcel. "Housing" for wildlife, not for students! Of course new housing is strongly needed in the region, and this project offers a great opportunities in that direction; but it does not make sense to destroy wetlands for the purpose. Rather, Bay View is ideally situated to serve as a natural buffer between marshes and developed areas. **69-1**

Moffett Field requires significant cleaning and decontamination before the site will be suited for further development. This cleaning should be the responsibility of NASA, and should be carried out before transfer to USFWS. **69-2**

Thank you for considering my concerns.
Cordially,

Stephen Brown
6706 Moeser Lane
El Cerrito CA 94530

LETTER 69

Stephen Brown, El Cerrito, January 28, 2002.

69-1: No wetlands are being filled for the purposes of housing under the NADP. The Bay View does not contain jurisdictional wetland areas. Appropriate buffer areas would be provided between Bay View development and wetlands. Please see Comment 39-2.

69-2: Please see the response to Comment 27-6.

X-Sender: jgordon@mail.arc.nasa.gov
Date: Mon, 28 Jan 2002 12:52:24 -0800
To: solliges@mail.arc.nasa.gov
From: John Gordon <jgordon@mail.arc.nasa.gov>
Subject: EIR Comments
Cc: gtiffany@mail.arc.nasa.gov, tjforsyth@mail.arc.nasa.gov

Hi Sandy,
We have reviewed the EIR and I only have a couple of comments for now.

The proposed siting of the control tower may present future problems. Because of its planned location, use of a traffic pattern to the east of the field could be precluded due to visibility constraints imposed by the hangars. This would necessitate use of a west traffic pattern. Our noise contours were based on traffic patterns using the east side of the field for the most part. Another analysis would likely show increased noise levels to the west, or a "bulge" in that direction if traffic restrictions were necessary. **70-1**

The burrowing owl habitats will need to be located outside the runway/taxiway safety areas. It looks like they are in the report, but when this plan is implemented we will need to provide the performing organizations with specific direction on fence locations, etc. I don't know if this is proper for EIR purposes, but it is a concern. We could provide data defining the safety areas for preparation of "to scale" drawings if you'd like. Also, several other points in the preferred alternative will require coordination with our office, though none of them appear to be unworkable. **70-2**

In volume I, there is a paragraph describing the CRAF proposal that NASA elected to not go forward with. I'd recommend the subject term ""great opposition" be replaced. Possibly the Mountain View vote results and the fact that we had 5 (I believe) public meetings and the attendance figures for those meetings would serve to be more objective than a vague term. **70-3**

I hope I'm sending this to the right place. If not, please lead me in the right direction.

Thanks,

John

John D. Gordon, C.M.
Deputy Chief, Aviation Management Office
Manager, Moffett Federal Airfield
NASA Ames Research Center M/S 158-1
Moffett Field CA 94035-1000

Ph: (650) 604-0931
Fax: (650) 604-3144
Pager: (650) 997-6626

LETTER 70
John Gordon, January 28, 2002.

70-1: Please see the response to Comment 16-12.

70-2: The proposed burrowing owl preserves are located outside the runway/taxiway safety areas. When detailed design of the burrowing owl preserves near the runway/taxiway safety areas occurs, the Moffett Field airfield operations groups would be consulted. The design of the owl preserves accommodates the requirements for safe airfield operations.

70-3: The commentor appears to be speaking about a paragraph on page 1-19 of the EIS. The commentor is mistaken about the terminology used. "Public opposition", and not "great opposition", as the commentor states, was used.

January 28, 2002

FAX 650 604-0680 Jennifer Chan/
Sandy Olliges

Sandy Olliges
NASA Ames Research Center
Mail Stop 218-1
Moffett Field, CA 94035-1000

Dear Ms. Sandy Olliges,

In regards the Draft EIS for NASA Ames Development Plan I have the following concerns about what I perceive as deficiencies in the environmental analysis and in the presented plan. The baseline priorities of NASA Ames must be clear.

1. Moffett Airfield will continue operation, one presumes, not only as a research arm of NASA Ames but as the base of operations for the California Air National Guard. These two levels of use need to be addressed. The safety factor of airfield use for training and practicing landing requires an arc or buffer zone for approach, take-off and circling that limits building height and proximity to the runways and placement of residences, recreation and child care? Will conjunctive use with a wildlife preserve be compatible? Please also elaborate on the noise level parameters for both these types of airfield uses. I would think that airfield use would remain the top priority for this facility in consideration of its unique site, continuing viability and irreplacability. **71-1**

2. Half of the NASA Ames Development site is within the 100 year flood prone coastal area subject to tidal flooding, according to USGS surveys. Long term disposition of Cargill salt ponds and levee maintenance needs to be addressed. If marshes are opened to tidal action, either by the MidPeninsula Open Space District's Crittenden marsh, or by the Navy clean-up of the stormwater ponds, then drainage channels and streams will support more varied ecosystems. All aspects of this San Francisco Bay interface needs to be fully reviewed in this DEIS document. The local drainage plan will be altered by the extensive fill for the Bay View housing element and by limited fill elsewhere. This can be engineered in an environmentally effective manner and needs evaluation in DEIS. **71-2**

3. The Biological Assessment, Appendix E, depicts Wetlands and Waters of the U.S. at Moffett Field, in Figure 11, and identifies 5.3 acres of seasonal salt marsh and transitional habitat in the Bay View area. These wetlands, seasonal salt marsh and transitional habitat need a management plan and open space dedication with a strong conservation parameter or buffer that assures the continual well-being and health of the Federally Threatened and Endangered Species: Salt Marsh Harvest Mouse, California Clapper Rail, California Least Tern, Western Snowy Plover and California Brown Pelican. All other closed bases in the Bay Area have started out with this element of a preservation of wildlife habitat plan, and not to have this element in this DEIS is a deficiency. **71-3**

The wetlands and uplands and fishery of Stevens Creek are omitted from this DEIS. This is also a deficiency. Steelhead and perhaps salmon are species that need to be reviewed as to impacts to water temperature and water quality from outfalls to Stevens Creek of stormwater runoff and of underground pumping operations. Any extension of Charleston Road into the Bay View area will impact Stevens Creek. Riparian setback and riparian corridor should be addressed as well as wetlands. **71-4**

4. The Burrowing Owl management plan cannot be considered representative of the habitat needs of the afore-mentioned species. Its choice as an indicator species for anything but the inland upland habitat creatures is a serious deficiency. The Burrowing Owl habitat plan does not appear to be functional in that the decline in numbers of burrows in use from 72 to 19 in just a few years is very worrisome. The burrowing owl preserve locations are fragmented and recent management practices need to be reassessed for this DEIS. Are squirrels being irradicated? **71-5**

EXTRA PAGE. 001

need to be reassessed for this DEIS. Are squirrels being irradicated?

5. Toxics and on-going Navy remedial cleanup operations need to be fully referenced in this report as to exact location of potentially contaminated sites both above and below ground, the severity of the level of toxicity to both humans and wildlife, and the estimated time and effectiveness of cleanup. There appears to be a lack of continuity in the management of these efforts and the community needs to be assured that full disclosure is readily available and being updated as sites are acted upon. An initial report that I have from a decade ago bears little resemblance to present analysis and closure documentation is needed. If the present NASA Ames Development Plan is to be fully realized and implemented then assurances of student, worker and resident health and safety must be assured. **71-6**

As an instance of health and safety concern is the use of the Eastern Diked Marsh as a jogging and light recreational destination by present Ames employees, while the March 2001 environmental assessment placed PCB levels at twice the human tolerance levels at a depth of just 6 inches in the north-eastern parameters of the marsh. Such conjuntive use concerns must be addressed in this DEIS. **71-7**

Hazardous Materials Sites and Plumes (figure 3.7-1) needs a timetable for cleanup. The updated parameters and level of toxicity of the undergr.ound plumes must be evaluated in this DEIS to the extent that they make viable or unviable the sites for public institutional, commercial or light industrial uses and buildings. The liquefaction and seismic hazards might degrade caps or sealant methods suggested for routine building sites that would not be viable in this bay mud, earthquake fault laced zone. Public Resources Code Section 2693(c) defines such mitigation. **71-8**

6. Circulation and a balanced transportation element is not depicted for the NASA Ames Development Plan to the serious degree that is indicated by the level of proposed development of 8.4 million square feet. The connection to the Tasman Light Rail is an intrusion into California Air National Guard space or safety arc? What cycling corridors will connect to the Stevens Creek Trail and the Bay Trail? (Will the Bay Trail alignment bisect sensitive endangered species habitat and need to be moved?) How will the fenced-in NASA Ames campus be managed with resident car and pedestrian access and egress at multiple portals? How will Charleston Road be introduced into the circulation plan? What busses will be avaialable? Will they be Santa Clara County vehicles or institutional shuttles as on the U.C. and Stamford campuses? What parking spaces will be needed for this level of development and where will they be located? Underground parking or open field parking is indicated? **71-9**

The Mountain View staff report to the City Council was thorough in all aspects of this transportation element, both locally and regionally, and in regards the on-going concerns with air quality and the non-conformance with basin standards. I endorse all their state ments and conclusions of environmental impact concerns. **71-10**

7. Recreation uses need a formal element of their own for this development density. The golf course, ball fields, jogging and walking trails should have an assured amount of acreage and designated location for this DEIS. I find this lack a deficiency. Employees should not be induced to drive outside the 'campus' for such amenities at noon. By the same token, restaurants and some basic retail, such as drugstores, should be available. Will any form of commissary continue to be available? NASA Ames should strive to be a balanced community in all services such as libraries, fire stations and even some basic health clinic. Will there be a swimming pool? **71-11**

8. In regards the infrastructure, I do not feel that the increased demands for water were realistic. They are likely to be considerably higher. What is the Hetch Hetchy allocation for Moffett Airfield? Will all aspects of development have equal rights to this allocation? What back-up water supply is available to the campus? **71-12**

9. What percentage of the development will result in increased employment for less skilled workers of the present community? What are the prospects for recycling building materials from the tear-downs? What programs for educating youth will evolve? **71-13**

Sincerely, Libby Lucas

Libby Lucas 174 Yerba Santa Ave., Los Altos CA 94022

LETTER 71
Libby Lucas, Los Altos, January 28, 2002.

71-1: As stated in this comment, the airfield continues to be essential to NASA's mission and would continue to be used for federal purposes under the NADP. An analysis of the NADP's compatibility with airport operations has been added to Section 3.2 and 4.2 of this Final EIS. Noise resulting from the continued use of Moffett Federal Airfield was considered in the noise assessment. Continued airfield operations were discussed on page 3.10-21 and noise contours for continued aircraft operations are shown in Figure 3.10-7. The document, *Assessment of Aircraft Noise Conditions at Moffett Federal Airfield (1999-2000)*, referenced on page 3.10-21, was the basis for the noise contour locations shown in the report for year 1999 and year 2010. Year 1999 assumed 64.5 operations per day on average. Year 2010 assumed 66.5 operations per day on average, which included increased NASA flights. The best available noise data for existing and continued use of Moffett Federal Airfield was therefore considered in the assessment of noise and land use compatibility for the proposed project.

Use of areas near the airfield for owl preserves would be compatible. The owls currently nest in the locations where the preserves are designated.

71-2: Only a small percentage of the proposed development under the NASA Ames Development Plan falls within the 100-year flood zone, although approximately 42 percent of Moffett Field lies within the flood zone area. This flood zone is confined mostly to the Eastside/Airfield District, which is not proposed for new development under the NADP.

The only portion of the development proposal that falls within the flood zone is the Bay View District. During construction, fill would

be added so as to elevate 11 hectare (28 acres) of the land above the flood area.

No jurisdictional wetlands would be filled to enable this project. The revised storm drain system, which is described in Section 4.5 of this Final EIS, would limit the impact of the fill in the Bay View area.

71-3: The wetlands, seasonal salt marsh and transition habitats occur in the "North of Bay View" area on NASA's property and would not be developed under any of the alternatives. Additional land in the Bay View area designated as open space would be designed to protect and buffer sensitive habitats such as wetlands, and would be located between parcels that contain those features and parcels slated for development. Locations of wetland, open space, and preserve areas, as well as their acreage, are included in Figures 2-1 through 2-5, and in corresponding Tables 2-5, 2-7, and 2-9. Their configuration and size are designed to protect and buffer the wetlands of the Bay View and North of Bay View areas, preventing impacts to habitats and sensitive species that are located closer to the bay.

The commentor points out the need for a habitat management plan for the wetlands, seasonal salt marsh, and transitional habitats. NASA is currently preparing an Integrated Natural Resources Plan for Ames Research Center. This plan will provide a comprehensive overview of the resources that occur on-site (including wetlands), as well as provide guidance for natural resource management at Ames Research Center See also response to Comment 26-14.

71-4: See response to Comment 26-18 for a discussion of potential impacts to Stevens Creek fisheries and water quality from increased stormwater discharge. The addition of the Charleston Avenue Bridge and the extension of Charleston Road into the Bay View area are not proposed by the NADP, and the impacts of these features on Stevens Creek and the Bay View area are therefore not addressed the EIS.

These impacts would be addressed through a separate environmental review process associated with that project, should it be pursued in the future.

71-5: The question of whether the burrowing owl preserves fragment owl habitat is addressed under Comments 21-38.

The number of owls burrows fluctuates from year to year. ARC has had a high of 25 observable pairs in 1995 and a low of 14 pairs in 2001 and 15 pairs in 1992, 1993, and 1997. In 2000, there were 18 observable pairs, which is not an especially low number. Over 10 years of observation, 18 observable nests is the average. The 72 nests mentioned in this comment is probably a cumulative number of nesting locations over a number of years. The owls move around from nest to nest. To our knowledge, there have never been 72 owl nests at one time located on NASA ARC property.

Eradication of squirrels is a problem for burrowing owls and this issue is addressed in the *Burrowing Owl Habitat Management Plan*. Squirrel control at NASA is conducted in close consultation with owl experts and NASA environmental specialists and meets the requirements of the California Department of Fish and Game.

71-6: All known contaminated sites at Moffett Field area shown on Figure 3.7-1 of this EIS. The levels of toxicity of different areas of the Regional Plume are also shown on Figure 3.7-1. Information on the severity of contamination of the sites described in Section 3.7 can be found in the clean-up documentation for each site, which is available in the administrative record at the Mountain View Library. The estimated timeline for and effectiveness of the proposed clean-up for each site is already described on pages 3.7-7 through 3.7-19. The vast majority of contaminated NASA and Navy sites are being cleaned to residential levels. The only exceptions are localized areas where access to contamination is restricted, such as fuel farm and electrical

substation/transformer areas, which may be cleaned to industrial standards.

Management of the clean-up effort is closely coordinated among the MEW companies, Navy and NASA under the oversight of the EPA and the Regional Water Quality Control Board. As mentioned above, information on each contaminated site is readily available in the administrative record for Navy, MEW and NASA sites in the Mountain View library. The Navy has a mailing list for distributing information to the public about the clean-up of its sites. The contact information for being added to the Navy's mailing list is described above in the response to Comment 26-16. To be put on the equivalent mailing list for NASA sites, contact Sandy Olliges at (650) 604-3355 and ask to be added to the subsurface information list.

71-7: Please see the response to Comment 26-20.

71-8: Soil surveys will be performed prior to detailed building designs to ensure adequate site preparation. See Comment 26-23.

71-9: The extension of the VTA Light Rail system from Tasman to Mountain View is an existing facility and was constructed based on the requirements of users at and near Moffett Field. The Bay Trail is expected to intersect the Stevens Creek Trail along the west edge of the project site. The exact alignment of the Bay Trail has not been finalized, and environmental issues associated with its development would be the responsibility of an entity to be identified as part of the planning process organized by ABAG and its partner organizations. It is not within the scope of this project. Vehicle and pedestrian access to the NASA Ames Campus at multiple portals would be operated similarly to current conditions. In some cases, pedestrian and bicycle access would be enhanced with new or wider sidewalks, and new bicycle facilities.

A new vehicle bridge connecting Charleston Road to the project site over Stevens Creek is not included as part of the proposed project and the evaluation in the DPEIS showed that this facility is not required to mitigate project impacts. However, the proposed project does not preclude construction of a bridge at this location.

Both VTA bus service and an on-site shuttle system are planned for the proposed project featuring five- to ten-minute headways throughout the NRP. There are no specific plans for additional VTA service at this time; however, the TDM Program calls for on-going coordination with VTA to ensure quality bus service to the site.

The proposed project is estimated to require 5,200 new parking spaces in structures and surface lots located throughout the NRP area. The exact location of each facility has not been identified at this time, although the TDM Program provides a concept overview of how parking could be provided in Appendix B.

71-10: This comment is an endorsement of a City of Mountain View report and not a comment on the DPEIS. No response is required.

71-11: Sections 3.12 and 4.12 of the EIS describe the recreational land uses that would be developed or continued under the proposed project. These include new park space, new active recreation space, the golf course, and passive open space for activities such as walking and jogging. The Computer History Museum and California Air and Space Center would also provide recreational and educational opportunities. On-site amenities are also planned under the TDM as described on page 2-28 of the DPEIS and page 2-27 of this FPEIS. Although replacement of the Commissary and Exchange would not occur under the NADP, development under the NADP would provide other retail opportunities and a variety of amenities to create a balanced community. There is an on-site fire station and health

clinic. University partners may provide libraries. It is not known at this time if a swimming pool would be provided.

71-12: The demand calculations for potable water are based on the following general criteria, which are stated in the EIS:

- Low flow fixtures would be installed in all new buildings as required by the Design Guidelines for the development proposed under the NADP. Even so, conservative values were used for the demand calculations.
- The use of reclaimed water and treated groundwater for irrigation and industrial (cooling and boiler makeup) uses would be integrated into the development proposed under the NADP.

By utilizing these criteria, the potable water demands for the development proposed under the Preferred Alternative for the NADP are not significantly higher than those for the baseline condition.

With regard to back up water supply, as indicated in the EIS, storage is proposed for fire protection and domestic residential use. These uses would have priority access to the back up water supply in case of short term interruption of service from Hetch Hetchy. In addition, the reclaimed water system would include hydrants to be used for fire protection in the event that service from Hetch Hetchy is interrupted by a condition that does not also interrupt the supply of reclaimed water to Ames Research Center.

71-13: The ARC Housing Demand Model, described in Chapter 5.2, projects the number of workers within various occupations and industries at ARC, based on 1990 Public Use Microdata Samples (PUMS) data. The analysis indicates that approximately 640 workers, or nine percent of new ARC employees, would be service workers and groundskeepers. Another 380 employees, or approximately five

percent of new employees, would be classified as "operators, fabricators, and laborers." The ARC Housing Demand Model also finds that approximately four percent of employee households generated by Mitigated Alternative 5 would have incomes below $50,000 and approximately 55 percent of households would have incomes between $50,000 and $60,000.

NASA currently has a recycling program in place for construction and demolition materials. To the extent possible, NASA would recycle building material waste from tear-downs.

The California Air and Space Center would include educational programs for children focusing on scientific questions for the future of space exploration. Additionally, the CASC is planning to include a youth residential space training experience. However, at this time the details of specific programs have yet to be fully developed.

The NASA Teacher's Institute would offer learning opportunities for teachers, including professional development programs and science education programs.

X-Sender: molloy@hoover.stanford.edu
Date: Mon, 28 Jan 2002 15:55:25 -0800
To: researchpark@arc.nasa.gov
From: Molly Molloy <molloy@hoover.stanford.edu>
Subject: Moffett Field Wetlands
Cc: sally@sallylieber.org, mkasperzak@mediates.com, rfaravelli@aol.com, mlzoglin@aol.com, rosemary@stasek.com, MPear@MattPear.com

Ms. Sandy Olliges
NASA/Ames Research Center
Environmental Services Office

Dear Ms. Olliges,

Thank you for the chance to comment on the draft environmental impact statement for the proposed redevelopment at Moffett Field. I have learned that NASA has selected Alternative no.5 as its preferred alternative, which I find unacceptable for many reasons. It provides no buffer for the wetlands and does not promise significant onsite wetland resstoration. We must preserve our open space and natural resources, especially tidal wetlands along the Bay shoreline. My husband and I quite often enjoy walking along the wetlands in this area, especially watching birds. We know that there are many people who need this open space, as well as the animals themselves.

I can group my remarks into four areas. First of all, any development project at Moffett Field requiress that NASA clean up the site's contaminated historic wetlands and then turn them over to the U.S. Fish & Wildlife Service. Tidal wetland restoration must be completed before these lands are incorporated into the refuge. The Site 25 cleanup process must not preclude such activities. 2) The Bay View parcel should be designated as a critical habitat buffer. We must save these habitats for the large numbers of shorebirds, waterfowl and other birds (even warblers), particularly during migration periods. Most places today are filled and built upon, so we must save the wetlands that we have left. 3) Bay View is the wrong place for housing since substantial fill is required. Placing housing in a floodplain is poor public policy, out-dated and impractical, and a true waste of this precious space. NASA should propose housing in a more appropriate upland location, NOT in this floodplain. 4) We want to restore a continuum of wetland habitats in the Mountain View/Sunnyvale area, including the Cargill salt ponds, the mouth of Stevens Creek, and the Moffett Field wetlands and associated upland habitats. Birds and animals don't understand boundaries - they should have connected land for their use. This would save endangered species and Pacific Flyway waterfowl, improve water quality, enhance biodiversity, and importantly, protect this open space permanently. We all need open space and there is just not enough of it these days!

72-1

We hope these points will be included in NASA's vision for the future of this site. It is vital for us all.

Sincerely,

Molly Molloy
2366 Jane Lane
Mountain View, CA 94043-2723

LETTER 72

Molly Molloy, Mountain View, January 28, 2002.

72-1: This letter summarizes several points that are presented in Letter 39. Please refer to responses to comments in Letter 39.

Date: Mon, 28 Jan 2002 16:06:02 -0800
From: "David D. Simons" <davidsimons@pacbell.net>
Subject: Moffett Development EIS Comments
X-Sender: d2simons@postoffice.pacbell.net
To: Research Park EIS <researchpark@mail.arc.nasa.gov>

Dear NASA Ames/Moffett Field EIS Development Group,

I would like to constrain my comments about the EIS to a few questions that were not addressed in the draft EIS.

My first concern is the traffic impacts of the development options on the City of Sunnyvale. Specifically what the traffic impact would be on the proposed Mary Avenue 101/237 bridge into Moffett Park.

Question 1: What would the full development of NASA Ames/Moffett Field on the Mary Avenue corridor if the bridges were to be built? What would the increase in auto traffic be up and down this arterial? **73-1**

Question 2: If there was no construction of these bridges, would this severely impact the access to Moffett Field's Research Park from the South side of the project? **73-2**

Question 3: Would a pedestrian/bicycle bridge at Mary Avenue over 101/237 instead of the auto facility better help a TDM program meet commute alternative goals as good or better than adding auto capacity to the Moffett Field/Moffett Park area? **73-3**

My second concern is whether cooperation with Moffett Park's TDM program would be useful.

Question: Would cooperative bus service and planning activities to local centers for services (Downtown Sunnyvale, Moffett Park to the South and other local services (hotels and the like) lower single occupancy vehicle trips significantly? Should it be considered? **73-4**

My last question is whether the Bernardo Avenue/Caltrain under crossing that is a TIER 1 Bicycle project would be of significant importance to commute alternatives for the Moffett Field Development Options? What would projected numbers of users for this facility that would be working in the Moffett Field area? **73-5**

I would also like to stress the importance of the options to be considered for development utilize the VTA Bicycle Guidelines for planned facilities.

73-6

Sincerely,
David Simons
Vice-Chair, City of Sunnyvale Planning Commission
Chair, VTA Bicycle Pedestrian Advisory Committee

LETTER 73
David Simons, January 28, 2002.

73-1: The traffic impacts of the proposed project on the proposed Mary Avenue bridge over Highway 101 and Highway 237 were not analyzed since the bridge is a planned long-range improvement that is not warranted by implementation of the NADP project (currently there is no schedule for implementation) and for which no funding has been secured.

73-2: The Preferred Alternative (Mitigated Alternative 5) is expected to add between 60 and 79 total peak hour vehicle trips to Mary Avenue South of Central Expressway. This is the least increase to this roadway segment among the alternatives; Alternative 4 would add the greatest number. Some of these trips might use the Mary Avenue bridge if it is constructed, but the exact amount was not estimated in the DPEIS. Based on City of Sunnyvale and VTA guidelines, the proposed project is expected to have a less-than-significant impact at the Mary Avenue/Central Expressway intersection under Alternatives 2, 3, and Mitigated Alternative 5 as shown on pages 4.3-18 through 4.3-22 and page 5.3-9 of the FPEIS. Alternative 4 would result in a significant impact at this location. Access to the site is expected to be more difficult without the Mary Avenue bridge than it would be if the bridge were constructed. However, most of the new land uses included in the proposed project are located on the west side of the airfield, where less congested access is provided via Ellis Street and Moffett Boulevard.

73-3: While it is true that any bicycle and pedestrian infrastructure improvement would improve conditions for walkers and cyclists, total cycling potential cannot be fully realized until all impediments to bicycling are removed from the entire transportation network. Therefore, an individual bicycle improvement, such as a Mary Avenue

bicycle bridge would probably create only a modest impact on bike mode share.

73-4: It is possible that cooperative bus service and planning between NASA and its partners and Sunnyvale's Moffett Park area could benefit both the NRP and Moffett Park and reduce overall vehicle trips. The Moffett Park Transportation Management Association and the future NRP TMA could explore such cooperative efforts once the NRP TMA is formed.

73-5: The Bernardo Avenue bicycle connection is an important part of expanding bicycle facilities in the Sunnyvale area to encourage bicycle travel. However, this improvement by itself would not change impacts anticipated with implementation of the proposed NADP project. It is not possible to accurately estimate the number of users of this facility that would work in the Moffett Field area.

73-6: The VTA Bicycle Technical Guidelines were consulted in developing the NRP Design Guidelines and the TDM Program. The VTA guidelines were used as minimum standards for bike rack placement and the amount of bicycle parking that should be provided. The bicycle lane network throughout the NRP as defined by the NRP Design Guidelines meets or exceeds all the VTA guidelines.

101 Alma, apt. 701, Palo Alto, CA 94301 650 322-8571 January 28, 2001

Ms. Sandy Olliges NASA Ames Research Center
Mail Stop 218-1
Moffet Field, CA 94035-1000

Dear Ms. Olliges:

We're all familiar with the world-wide problem of obesity, in which people take in, not asbestos, not anthrax, but good, nourishing food, only too much of it. In the same way, governments spend taxpayers' money to "nourish" cities and regions so that they'll grow and develop. NASA and its predecessor agency, NACA, were important in the growth of Santa Clara County. We moved to Los Altos to be near my husband's job at NACA; our home had been built for a family of a returning GI who also worked at Ames--of course, GI loans were also a factor in the extraordinary transformation of our region from orchards to homes.

Just after we moved, Sputnik, the first satellite, inspired the nation to invest in a giant space/defense program, and those tax dollars moved disproportionately to Northern Santa Clara County, partly because of the Ames Research Center, but mainly because of the presence of Stanford, where there were some 8,000 empty acres under one control, as well as brains, alumni wealth, and greed. Stanford Industrial Park could not have been created anywhere else in the US.

However, the unexpected transformation of foothills which had been designated potential housing on the County General Plan, into industial, caused a jobs/housing imbalance in Palo Alto and traffic gridlock in the surrounding towns and unincorporated areas which has grown and grown and GROWN as all the surounding towns, and Palo Alto itself, jumped on the treadmill of more development to pay more taxes to pay for the cost to the cities of development. 74-1

I was present at the first round of public meetings about Moffet Field development, many months ago. A preponderance of knowledgeable and articulate citizens pleaded with you to provide housing on that site, not "research and development", which is a fancy name for industrial. You, that is the federal policy makers speaking through you, thought you knew better. For you now to say "Why, the people who take the industrial park jobs will live elsewhere" is incredibly naive. Of course they will! That's the PROBLEM.

There's some political rulebook someplace that says that communities always want more jobs, but stable and prosperous comunities are built on home ownership. A young family which bought an $850,000 home in Palo Alto a year ago has spent $100,000 in mortgage payments, entirely dependent on over-inflated salaries on which 30% income tax is paid--talk about biting the hand that feeds you! --with no increase in equity and a loss of $50,000--$100,000 in value, due to the loss of thousands of jobs. This community is being force-fed like a Strasbourg goose, to harvest the foie gras for the benefit of influential outsiders who make campaign contributions, while cities elsewhere in the country are starving for government assistance to create new jobs for the jobless families which already live there!

But Moffet Field could be used as a national investment which would benefit the entire country in exactly the same way as the land-grant colleges benefited us over a hundred years ago. The existing housing should be preserved and used as a grant-in-aid for students in any of the helping professions--teachers, nurses, including lvn's and cna's, therapists, medical students including residents and post-docs, social workers and ministers to the homeless and needy. They'd incur an obligation to work at these professions a certain number of years, but could be released from that obligation simply by paying back the fair market value of the housing, plus interest, making the grant-in-aid, in effect, a superior student loan, because it's implicit in choosing to work at a better paid, albeit less socially useful job, that you thereby have the money to pay off the student loan.

We also should recognize that the barracks we supply our naval personnel are substandard. Nobody who could afford better would live there, and if they were not used for poor students who spend most of their time elsewhere and look forward to better housing when they are employed, they would be torn down.

Then, have some pity on Mr. and Mrs. America, the ordinary citizens who cede up to a third of their income and up to half of their lifetime savings to pay your salary, and the President's salary and the Congress's salaries and all kinds of programs for the deserving poor, deserving oil shieks, and deserving campaign contributors. Why do we have to pay a million dollars an acre for HUD subsidized housing, when we already own beautiful nearby land? Isn't that like paying for political campaign air time when we already own the airwaves? Why can't we have senior housing, handicapped housing, AIDS patient hostels and hospices at Moffet? 74-1

We should also have rental housing for teachers, firemen, policemen, civil servants and other community workers, but it would not be subsidized housing in the usual sense of the term. They would pay the same rents as for comparable housing elsewhere in the US, that is, fully pay for the cost of construction and maintenance, and pay for what the land would cost elsewhere, just not as much as it would cost here--which, by the way, is not as much as it is made out to be. The land and open space insulation for ten 450 square foot studios costs no more than for one 4,500 square foot house, but cities tupically allow developers to build multiples right out to the edge of the lot to maximize profit, and then the neighbors resist, where they would accept multiples if they were held to the same FAR standards as single family homes.

Now developers have gotten the California Legislature to demand that every city identify potential sites for high density housing, and not just in Palo Alto, but in cities with little or no employment destinations, like Los Altos and Los Altos Hills. There is no space. Yet cities keep building office buildings where high density could go, heedless of the impact of the forced housing density on neighborhoods. We need nearby federal land to help this problem, not exacerbate it.

Yours truly,
Stephanie Muñoz

Stephanie Muñoz

LETTER 74

Stephanie Munoz, Palo Alto, January 28, 2002.

74-1: This letter primarily expresses opinions only and does not comment on the adequacy of the DPEIS. No response is required. For more information on housing provision under the NADP, please see the response to Comment 14-27.

Date: Mon, 28 Jan 2002 16:13:45 -0800
From: Jeff Segall <jsegall@mac.com>
X-Accept-Language: en
To: researchpark@arc.nasa.gov
Subject: Draft EIS comment letter

655 California Street
Mountain View, CA 94041
January 28, 2002

Ms. Sandy Olliges
NASA Ames Research Center
Environmental Services Office
M.S. 218-1, Moffett Field, CA
94035-1000

(Submitted via Email)

In RE: Draft EIS for Ames Development Project

Dear Ms. Olliges,

As someone who has spent the last 20 years working in scientific research, and much of that time working within an academic environment, I am very excited by the possibilities of world class research center and university complex at Ames Research Center at Moffett Field. However, my experience watching development projects as well as my training as a scientist has taught me that paying attention to details is important to realizing the potential of any project.

Therefore, while I endorse the overall goals of the Ames Development Plan (ADP), I am concerned that an the development in the preferred ADP alternative analyzed in the draft EIS does not provide adequate housing to offset the jobs created. According to the EIS, the preferred alternative will worsen the existing housing shortage by creating a net need for 3100 new housing units. In an area already suffering a serious chronic housing shortage, this additional demand for housing will lower the quality of life for local residents and will negatively effect the success of the development at Ames. In addition, the shortage of housing adds to the traffic and air quality impacts identified in the draft EIS. Therefore, additional measures should be investigated as

75-1

part of the draft EIS to mitigate these impacts. 75-1

One possibility that should be explored is working with the Army to redevelop the existing housing at Moffett Federal Airfield to make better use of the available land. Higher density housing would accommodate Army needs while providing people working at the new development at Ames. This in turn would help offset the housing and traffic impacts of the ADP. 75-2

Alternative 5 of the ADP does provide for some housing, but unfortunately it is located in an area that was historically bay wetlands and is in a floodplain. In order to address the potential for flooding, the ADP proposes almost a quarter million cubic yards of fill. This presents both significant environmental and logistical concerns. There are considerable ongoing efforts to restore bay lands in the region and the bay fill proposed for the Bay View parcel is inconsistent with those efforts. The draft EIS should analyze the impact of bay fill on the efforts to restore the regionÆs bay shores. 75-3

In addition, the draft EIS discloses that the fill will require 17,000 truckloads, but the draft EIS does not appear to analyze the impacts that these truck trips will have on traffic. Over what period of time will these truck trips occur. 75-4

Another area where the draft EIS should conduct additional analysis is in the area of phasing. What are the additional negative impacts if job-creating development precedes housing? Could these negative impacts be mitigated by a phasing plan? 75-5

Respectfully submitted,

Jeffrey Segall

LETTER 75

Jeff Segall, Mountain View, January 28, 2002.

75-1: NASA has committed to include more housing in the development. Please see the response to Comment 14-27.

75-2: NASA is continuing to work with the Army on the use of the military housing, as mentioned in Mitigation Measure SOCIO-1a in this Final EIS. NASA is currently in discussion over allowing NASA substantial additional use of the family housing units.

NASA currently has access to use up to twelve of their units. In addition, NASA hopes to work out a set aside of a larger number of units exclusively for Ames Research Center.

75-3: Please refer to responses to Comments 21-19, 21-20, and 21-31, and the flood plain analysis in Section 3.2.D of the FPEIS.

75-4: The evaluation of truck traffic for the Bay View fill work effort is detailed and revised on page 4.3-29 of this Final EIS. No significant traffic impact is expected.

75-5: Information on project phasing has been added to page 2-66 of this Final EIS. Concurrently with this Final Programmatic EIS, NASA is also developing a Mitigation Implementation and Monitoring Plan that will identify the triggers for mitigations so that the impacts from the NADP would be no greater than those already identified in the EIS.

X-Sender: david%dceplanning.com@pop3.dceplanning.com
X-Mailer: QUALCOMM Windows Eudora Version 5.1
Date: Fri, 01 Feb 2002 12:19:08 -0800
To: sue@dceplanning.com
From: David Early <david@dceplanning.com>
Subject: Fwd: Comments on the NASA Ames Development Plan DEIS

Date: Fri, 1 Feb 2002 09:28:33 -0800
To: thanderson@mail.arc.nasa.gov, tmorrissey@mail.arc.nasa.gov,
david@dceplanning.com
From: Sandy Olliges <solliges@mail.arc.nasa.gov>
Subject: Fwd: Comments on the NASA Ames Development Plan DEIS

Another comment.

Sandy

======

From: COWallin@aol.com
Date: Fri, 1 Feb 2002 02:18:00 EST
Subject: Comments on the NASA Ames Development Plan DEIS
To: solliges@mail.arc.nasa.gov

Sandy Olliges:
After reading the subject document & Fact Sheet I strongly recommend the selec
-tion of Alternative #3 over Alternative #5
I find it difficult to believe the statement that Alternative #5 would have fewer
significant unavoidable negative impacts than Alternative #3.
Alternative #3 is a more desirable Plan because it provides far fewer negative
impacts to the nearby communities & the local infrastructure, as well as those on-site,
e.g. with Alternative #3--
1. there would be less demand for resources & services, such as water, power &
sewage treatment.
2. there would be far less traffic congestion, consequently much less pollution &
noise.
3. there would be no new construction in either the Bay View or Eastside/Air Field
areas, thus preserving/protecting habitat & sceinic resources.

In conclusion, Alternative #3 is clearly a more desirable and better Plan for the
NASA Ames development at Moffett Field.

76-1

Sincerely,

Charles O. Wallin

536 So. Frances St.

Sunnyvale, CA 94086

(408) 736-8650

LETTER 76

Charles Wallin, Sunnyvale, February 1, 2002.

76-1: This comment expresses support for Alternative 3 over Alternative 5. Please see the response to Comment 16-10.

needs HARD / all app.

COMMENT CARD

NASA Ames Development Plan Draft Environmental Impact Statement

Submit comments at meeting or mail to:

S. Olliges, M.S. 218-1, Moffett Field, CA 94035-1000

Comments must be submitted January 28, 2002

(Please Print)

Name William J. GARBETT

Title

Affiliation THE PUBLIC

Address P.O. Box 36132 San Jose, CA 95158-6132

Email address

Comments NO EIS available even though requested. Statutes should be tolled until available. Project is a political distribution of spoils. 77-1

Only the NO ALTERNATIVE (nothing) must be considered. 77-2

(use back if more space is needed)

LETTER *77*
William Garrett, San Jose, no date.

77-1: The EIS was mailed to the commentor on December 17, 2001.

77-2: This comment expresses an opinion only. No response is required.

1248 Levin Avenue
Mountain View, CA 94040
January 27, 2002

Ms. Sandy Olliges
NASA Ames Research Center
MS218-1
Moffett Field, CA 94035

Ms Olliges:

Initially, I thought that I would be a supporter of the Nasa Ames Research Park, but on reviewing the Draft Environmental Impact Statement (DEIS) prepared for the Ames Development Plan, I have become very concerned that this development will have a major negative impact on the residents of Mountain View and the endangered species that call the wetlands home. 78-1

1. The plan suggests that housing will be built on the area called "Bay View" that is adjacent to the wetlands. To develop housing on the Bay View site will require tens of thousands of truckloads of soil to be brought to this site that will contribute to the destruction of a fragile ecosystem. The city's roads will be adversely affected by this constant use of heavy trucks. The residents will also suffer from crowded roads, noise and pollution. There is no mitigation for this except to move the housing to a more appropriate site; one that does not require the importation of soil to a site that could be subject to liquefaction even with soil amendments. The Bay View parcel should be a habitat buffer between all development proposed and the wetlands. 78-2

2. The number of housing units proposed to meet the demands of a development of this magnitude is quite inadequate. In addition, there are concerns that NASA Ames is suggesting a parcel it knows to be inadequate even with mitigation so that it can later endorse a proposal requiring that the housing be built outside the parameters of the ADP. To show good faith, NASA Ames should build some housing on its site before building any of the proposed academic/research facilities. To create an environmentally friendly development, the housing provided on site should enable residents to walk or bicycle to work. 78-3

3. The development for the ADP project will cause increased congestion on the various highways serving our area: 101, 85 and 237. Traffic and congestion are identified as the major concerns of all Bay Area residents. What will Nasa Ames do to mitigate these impacts caused by this massive development? What mitigation will Nasa Ames propose to ameliorate the traffic/air pollution suffered disproportionately by the residents of Mountain View? 78-4

4. We are concerned that the DEIS review is inadequate and will be damaging to the burrowing owls that live on site. There is no assurance that the management plan adequately protects this population. 78-5

5. Noise analysis must be addressed before housing sites and day care uses are identified. What measures will be proposed to mitigate these impacts? 78-6

6. The residents of Mountain View must be invited to provide public comment throughout the development of this plan because the quality of our lives will be the most significantly impacted. How do you plan to invite the community to voice their concerns about a project of this magnitude that will greatly reduce the residents' quality of life? 78-7

7. My husband was identified by Trish Morrissey as a "Dear Friend of CACS" in a letter dated January 4, 2001 that contained a brochure outlining the plan and identifying the various sites. I hope when this process is complete, we might both be considered supporters. 78-8

It is imperative that the residents of our City continue to have the opportunity to comment as the plan is developed. Without this participation, there will be fierce opposition to the various proposals. We are not without political influence and our Congresswoman Anna Eshoo has always been attentive to our concerns; so we will have a voice. Why not consider proceeding in a fair and just manner, benefiting not only Nasa Ames, but also the residents who seem destined to be the most adversely impacted. 78-9

Sincerely,

Cecilia J. Keehan
& James F. Keehan

LETTER 78

Cecilia & James Keehan, Mountain View, January 27, 2002. (Received February 12, 2002.)

78-1: This is an introductory comment that expresses an opinion only. No response is required.

78-2: Please refer to the responses to Comments 21-19, 21-20, 21-31 and 26-23.

78-3: Please refer to the response to Comments 14-27 and 21-14. Residents in Bay View will be able to walk or bicycle to work using the extensive network of pedestrian and bike paths proposed.

78-4: The FPEIS identifies these significant impacts to traffic and air quality. By adding Mitigation Measure SOCIO-1b to Alternative 5, traffic impacts will be lessened. Please refer to the response to Comment 23-8.

78-5: Please refer to the response to Comment 21-38.

78-6: Noise impacts and mitigation measures are addressed in Section 4.10 of this Final Programmatic EIS. Please refer also to the response to Comment 21-32.

78-7: It has been important to NASA that the residents of Mountain View and Sunnyvale be involved throughout the development process of NASA's plans for the ARC. As noted in the DPEIS, a Citizen's Action Committee was formed in 1996 to suggest plan elements to NASA on how best to reutilize the former Navy property. The NADP incorporates almost all of the suggestions the committee advocated. In addition, NASA held public scoping meetings in July of 2000 on its plans, then issued the DPEIS and held public meetings on the plan and EIS in December of 2001. In April 2002, NASA

participated in the League of Women Voters community forum on "Moffett Tomorrow" regarding "quality of life" issues in relation to the NASA Ames Development Plan at Moffett Field.

78-8: NASA hopes to receive support for the project from the commentor and from all residents of the region.

78-9: Please see the response to Comment 78-7.

MS. LOCKYER: If every would take their seats, we will get started in a minute or two.

The floor is now open for your comments and questions. We have two microphones here. One in the far empty corner over there and one microphone here on the side. And if you want just go to either microphone. We'll alternate between them.

I also do have some cards that I'm going to read, so while those of you that wish to go to the microphone do. I'll just start with the couple of the cards that I have got.

The first question is: Where can I get or see a copy of the EIS to review? HI-1

MS. MORRISSEY: I don't know if this is on. Can everyone hear me with my answer?

The EIS is actually in all of the libraries. So there's actually one in the library here. There's one in the visitors center here. There's one in the Mountain View Public Library and one in the Sunnyvale public library. And I think there is also one in Sandy's office.

MS. OLLIGES: And also on the Web, Researchpark dot ARC dot NASA dot Gov. If you

log on there and click on the EIS, you'll have to go through a little registration screen as a security measure. But then you can look at it all as a PDF file on the website.

MS. LOCKYER: OK. Yes?

VOICE: I have a question, if I may.

MS. LOCKYER: Hang on one second.

VOICE: Talk now? Almost. Hello. OK. I have two questions. The first is an easy one that I think you have dealt with.

Sometime ago we talked about whether NASA under the Space Act could build buildings for housing like the military could. And there were some legal questions on that.

HI-2

So I know you are a legal person. How is that resolved? Did they need new legislation? Did they get it or did they decide they didn't need it? And how was that handled?

MS. MORRISSEY: We're proceeding with our development plan without any new legislation.

VOICE: Well, so you don't need it then; is that right?

MS. MORRISSEY: That's correct.

VOICE: It's been looked at and decided that was a non-issue. OK, the one I know

HI-3

is not a non-issue because you mentioned it is traffic.

And I wonder if you have projected what's going to be the traffic growth in the Bay Area in South Bay over the ten years? So where will it be in that time period? Because you're going to dump in another what, 15,000 people in -- in this site and subtract off the ones that are going to live on site and work out.

HI-3

So what's your -- have you shown what's your growth is going to be to the traffic on Bayshore in spite of all of this, versus what everything -- whatever other growth is in the Bay Area. Are you a big player, a big part of that growth, or are you a little player? And have you looked at that ratio?

MS. MORRISSEY: We did look at that when we did the cumulative impact analysis. We are required to look at what would the traffic be in the Bay Area ten years from now, even without this project. And then it's within that backdrop that we analyze and determine the impact of this project.

So we can't pretend like there is no other traffic, that you know we can just do

HI-3

whatever we want. We have to look at the actual traffic patterns that currently exist. And with the 7,000 people that we're adding. And with the TDM program that we're implementing under alternative five, the only significant impacts will be to the freeways, which are already operating at the LOSF. We will be adding more than one percent of the capacity to those freeways.

We did look at how all the other intersections are proposed to function ten years into the future. And with the addition of the traffic that we expect to generate from this trip after implementation of the TDM measures, we don't foresee that there would be a significant impact at the intersections.

There's a lot more detail in the actual EIS itself in terms of exact numbers of trips and the exact level of service of each of those intersections.

Now, ten years from now without the project, ten years from now with each of the alternatives, there, you know, a lot of detailed tables in the EIS. And I encourage you to look at those and then let us know if you have any

questions or comments.

MS. LOCKYER: Thank for your questions, Don.

Now and at this microphone.

VOICE: Hi, there. I imagine if you took a poll, they'd say it was a good idea to hide me behind a post here.

HI-4

OK. I just got the EIS at the end of last week. So I haven't had time to good over it in a loft of detail. Some of the stuff I am going to bring up may be covered in there. But in my experience it's a lot of stuff that often gets overlooked.

I am going to concentrate on the TDM plan and specifically the bicycle element of that. First of all, I didn't see anything in there about the traffic control during construction. If this thing is going to be built out in 2013, that means construction is going to be going on for a very long time. In my experience bike safety is consistently ignored by contractors unless there are policies that are adopted and enforced.

HI-5

Should I just go on with each of my points or do you want to answer them in turn?

How do you want to handle that?

MS. LOCKYER: Why don't you go ahead with all of your comments.

VOICE: OK. I noticed in there that you have adopted the VTA bicycle technical guidelines for bike lanes and bike parking.

One thing I did notice on all of the artist renderings I saw, there were no bike lanes shown, even though they are supposed to be on all of the roadways. Not a big deal. But it's something that's important to a lot of us. It would be nice if we knew that they were being implemented and taken seriously right from the start. HI-6

But there's a lot more to it than just bike lanes and bike parking. What you need to have are traffic engineers who have specific expertise in bike accommodation.

In particular I saw one comment in there that said low traffic volumes and the availability of sidewalks or shoulders provide a reasonable environment for cyclists. Anybody that knows anything about bicycle transportation knows that you don't encourage bicyclists to ride on sidewalks. That was in reference to the HI-7

existing Moffett Field facilities.

. I think what you need to have in addition to specific traffic engineering expertise is some sort of a bike committee to review these plans before they are implemented and to coordinate with the surrounding communities.

I know there was mention that the VTA and the cities were involved. And I know that's the case. But I know that in particular the bike committees for the VTA and Sunnyvale are not aware of any of what was going on here. There's a lot of that they've learned from their experience in developing bike plans. And I think the new development should benefit from that.

The TDM projections that I saw are extremely optimistic and will be difficult to meet. I think one way that you could achieve greater overall improvements is if you include the existing Moffett facilities in the plan, such as for the Eco Pass bike lanes, guaranteed ride home, that sort of thing.

So far the evidence I've seen is the perimeter fence that's being developed as part of this plan is going by my building 243. I work on

HI-7

HI-8

HI-9

HI-10

the traffic safety committee for the base.

I asked the chairman when he gave us a briefing about this if any consideration was given to bike accommodation. And he said of course not. As if it was a silly question.

HI-10

So in terms -- in conjunction with all the excellent things you hope to do for the new development, I would like to see improvements in the existing facilities, or at least not making them any worse.

There was a comment in there about the charging for parking that's going to be phased in since there is abundant parking to begin with. Well, that may be true. But in my experience when people get accustomed to free parking it becomes politically impossible to stop providing it later. So I'm not sure that's going to work out in the long-term.

HI-11

I think there also needs to be some sort of education component for both motorists and cyclists on sharing the roads properly. There could be promotion programs, some sort of maintenance for government bikes, all that stuff maybe in there. But it's also supposed to be part of what we have now, and it doesn't happen.

HI-12

In summary, I think there's great potential for bike commuting and transportation between buildings to help out a lot in reducing traffic. But we must be proactive if we're going to reach that potential.

HI-13

Thank you.

MS. LOCKYER: Thank you. I have -- do either of you wish to add a comment now?

MS. MORRISSEY: Thank you for your comments. And since most of them were in the form of comment rather than question, what we will do is we will analyze those in the EIS. The whole idea of a viable bike path that really works for commuting both to the center and around the center are very important to us for the project.

And so I do welcome your suggestions. And we will take a look at those and respond to them in detail in the final EIS.

Thank you.

MS. LOCKYER: Yes.

VOICE: Hi. I'd like to comment on a different part of this. First of all I'd like to say I think the research park is a good idea but I am not sure that alternative five is the

HI-14

perfect solution yet.

I came to the scoping meeting and was concerned about the Bayview parcel. And I guess it looks like the square footages have been reduced, although from what I understand that the housing is actually increased from 250 units to 750 units. And it's still a highly developed area there. HI-15

I'd just like to once again encourage you to consider alternatives that do not develop in the Bayview area. That is, you know, very critical area in that kind of area near the edge of the bay adjacent to the wetlands, as you point out, is becoming scarcer and scarcer in the South Bay. And while you may not impact endangered species directly there, there are all kinds of species that are being forced out of the entire areas these remnant areas are being built up. HI-16

Additionally, I had a little trouble reading the environmental impact station online, or statement online, because it -- BUS errors that kept causing it to die it's so many pages long, I guess. HI-17

But the description given there of the use in the adjacent salt ponds by endangered HI-18

species is actually kind of an understatement of the reality out there. There's one record of 1995 of some lease terns in the pond way out by the bay. The fact of the matter is over a hundred lease terns use the ponds directly north of Crypton Marsh annually in the fall the stage before migration. And while that isn't inside your area you are going to develop, we are approaching closer and closer to where those bizarre additionally clap rails when the reporter said to be low likelihood of breeding the Santa Clara County Breeding Bird Act was confirmed that they are indeed breeding in the marsh along Stevens Creek out there. HI-18

In addition, I didn't find much commentary on the impact this new project is going to have on the Stevens Creek riparian corridor. HI-19

I see now in the plan you intend to have a new bridge going over there which is going to definitely impact that corridor which is used heavily in migration by birds and other animals getting from the bay to the hills. HI-20

So there are a lot of impacts on some critical habitats out there. And I would like to

point out that when similar housing development was tried along Coyote Creek in Milpitas, which is now in McCarthy Ranch, eventually environmental groups sued to stop that development because of some of the things that you've been addressing here. Like the feral cat problem. Which, by the way, I don't believe that a strict no-pet policy is going to ensure that no pets are in your housing compound.

HI-21

HI-22

But there are additional problems with kids who go over the fences into the riparian corridor over the fences into the wetland area beyond there. And with 2,808 people in that housing complex, I don't think you're going to be able to stop that impact.

HI-23

So again, for those reasons, I don't think that is a good use of that land. It's also inconsistent with the adjacent land use north of Stevens Creek and going further down the bay. You have to go all the way to Alviso to find housing development that close to the bay edge. And it really isn't the trend of what's going on here. And it doesn't seem as environmentally conscious as you hoped your plan to be.

HI-24

So basically a summary. I'd like to

just say that I would prefer alternative three, where there is no development in the Bayview district. And I understand this places you in a bind from the traffic consideration and by having housing there, you hope to reduce those numbers and keep them under the critical level.

H1-24

But I would encourage you maybe to scale back the size of your project in other ways so you don't need to develop those critical areas near the bay.

MS. LOCKYER: Thank you.

MS MORRISSEY: Thank you again. We'll take a look at those comments, especially the ones about the presence of the endangered species that were not mentioned in our studies. We'll analyze that further.

Also just as a point of clarification regarding the bridge. NASA is not proposing to build the bridge. That's something that the City of Mountain View perhaps would do. What we did was just -- and if they did do it. We analyzed that traffic pattern along with the other traffic pattern if they didn't do it just to see if there would be any impact on the traffic.

As far as the impact on the Stevens

Creek corridor, if they did, if Mountain View did decide to build that bridge, they would have to do a separate environmental document and coordination with Fish and Wildlife service looking at the riparian habitat impacts of building the bridge.

MS. OLLIGES: And I just want to make a general comment and point out. We have a court reporter here that's making a record of all the comments that we receive. So we will have all the comments that everyone makes here today to take back with us.

MS. LOCKYER: Let me just read a few of the cards I've got because I am getting a stack.

This one says: Please explain the rationale for the placement of the new fence on the south side of the Ames campus which eliminates sidewalks and significantly impacts pedestrian bicycle and vehicular traffic.

H1-25

MS. MORRISSEY: Yeah. As you know, with the fences being put in, not as part of this project itself but as part of opening up the campus to the public, the NASA Research Park campus to the public. And the fence is being constructed so that we can keep Ames secure

behind that fence instead of card-keying each building.

The location of the fence was studied by the engineering group. And there were traffic studies done on it to see what the best placement of the fence would be. We have to consider not only the traffic on the Ames campus side, but also on the NASA research side as well. So we did actually look at that.

MS. LOCKYER: My next card has two questions. One is regarding the development of recreation facilities. Where does the golf course fit or does it? H1-26

MS. MORRISSEY: There is no planned changes to the golf course in alternative five. You can see on the map that's up there the golf course pretty much stays where it is. There's burrowing owl nesting around the edge of the golf course now. And that would continue the area that is the darker green, would be designated as the burrowing owl habitat under alternative five.

But no real changes are planned in the development right now in terms of the golf course. It would stay as is.

MS. LOCKYER: And the second question is what is the ramp up phase for completion date for the California Air and Space Center? And I can probably answer that best. HI-27

As Michael Marlaire mentioned, we are in the process of completing our feasibility study and development plan. That should be done in February of 2002. We estimated it will be anywhere between five and ten years in before it actually opens. And that all depends on funding.

Yes.

VOICE: I notice that your traffic analysis shows greater than one percent. How much greater? Five? Ten? Twenty? HI-28

MS. MORRISSEY: You know I was hoping I had made that note because I thought I might get that question. I don't have the exact answer with me. I think it's around five -- it's less than five percent. I think it's around two and a half or three percent of the capacity.

VOICE: OK. How can you proceed if you're going to severely impact already impacted traffic, pollution and housing problems? If this project is going to impact those severely or significantly, how is the project allowed to HI-29

HI-29

proceed? Do you get variances or what?

MS. MORRISSEY: The way the National Environmental Policy Act works, it requires the federal agency to describe the impact adequately. In other words, we can't hide anything. We have to convey to the decision-makers, our management, what all the environmental impacts are so they can take that into account in their decision-making process.

EPA also requires us to implement all reasonable mitigation measures. That's why we have -- are proposing the aggressive TDM program. That's why we are doing the on-site housing. Both to help with the air traffic and the -- and the housing. I'm sorry, the air quality, the traffic and the housing. All of those impacts are kind of interrelated, as you can imagine.

So even if there's a significant environmental impact, the way the law -- the law is written, as long as we describe it adequately, take what mitigation measures we can, if NASA still feels that they have an overriding purpose and need in order to meet their mission, they can go ahead and do that.

VOICE: OK. On the housing you said you would bring -- you project bringing 2800 people into the housing. And I believe it was short-term housing. But even short-term housing, you're housing families and they have children. 2,800 people. That's probably almost an elementary school size number of children. Where they will go to school?

HI-30

MS. MORRISSEY: The children would go to the -- I think it's the Mountain View-Whisman School District.

VOICE: Is there room?

HI-30

MS. MORRISSEY: There is room. We have analyzed the capacity. Again, it's in more detail in the EIS. But I believe we are within the capacity of both the elementary and high school districts.

VOICE: I also think it would be very helpful to improve the bike access like the Moffett Boulevard gate. And even from the Stevens Creek trail. So that people could get to the Bay safely. Moffett Boulevard is dangerous for bicycles. I've seen a couple of them in the bushes with police and ambulances and cars aside. So if that could be improved I think

HI-31

that would be very helpful in helping you reduce the number of trips to the base.

HI-31

MS. OLLIGES: Well, that is an important part of our project. We are planning to improve the access on the Ellis Street gate. So there's a pretty good bridge being built down at Baragas, down in Sunnyvale, will improve the southern access for bicyclists on the Moffett intersection itself will also be improved although I am not sure yet. It's not part of the project to change the bridge over Stevens Creek at this time.

VOICE: Would it be possible to provide better access from the Stevens Creek trail? Currently you have to go way past building 258 and then backtrack towards the base. And if you're going towards the building 200 area, it adds an extra mile to your trip or more. It seems to.

HI-32

MS. MORRISSEY: We'll certainly look into that.

Thank you.

MS. LOCKYER: Thank you for your comments. Actually the next card also asks a question about housing. Who can live in the new

HI-33

housing to be developed?

HI-33

MS. MORRISSEY: Anyone who works here or goes to school here will be eligible to live in the housing. Obviously not everyone will be able to because there's going to be more people living or working or going to school here than there is available housing.

There will be, one of our development partners, probably the University of California managing the housing. They have a lot of experience doing that, obviously. They have housing on all their campuses. And so they will set up some entry criteria. And it will be application process.

But everyone who works here and goes to school here would be eligible.

MS. LOCKYER: The next card has a question and a comment. How is design of architecture to be determined? Your concept design appears old-fashioned.

HI-34

HI-35

MS. MORRISSEY: The design concepts were actually developed in conjunction with actually NASA management. And the design concepts are more specifically detailed in our design guide. Certainly the concepts that we

have drawn up are just artists' renderings of what it might look like.

Although we are planning to go with a traditional design that will be complementary to the historic district and the Shenandoah Plaza. So there will be some traditional elements in the design.

MS. LOCKYER: I am going to keep reading these cards. But please feel free to go to the microphone if there is anyone out there.

And I have a card from Kevin Jackson. Did Mr. Jackson make his comment? OK.

The next card says: What is going to happen to the commissary and exchange stores in your plan of renovation.

H1-36

MS. MORRISSEY: In our plan you may notice that we're actually planning new construction over the sites where the existing exchange and commissary are. We have been working with the military tenants to find a new location for them. And I believe they are looking at the demand for the commissary and exchange on site. We incorporated the trips for the commissary and exchange in our traffic analysis and will continue to work with the

military tenants on where they want to locate those.

MS. LOCKYER: Yes.

VOICE: I was a bit surprised to hear that today that we are going to be tripling the number of people working on the site. And I think that's part of the problem. We're trying to stuff too many people into the research center. HI-37

And I noticed that this list of the scoping comments that that number four was, do not develop Bayview. And yet to mitigate housing and traffic, Bayview was sacrificed. So we're now going to develop on Bayview. HI-38

So the fourth most important scoping comment like was totally ignored. And that's interesting that you've mentioned in the presentation that the Bayview was a mitigation for excessive housing and excessive traffic, and yet developing on Bayview requires a mitigation in itself. So here we have a mitigation of a mitigation. Which sounds to me like fancy footwork. And I don't know if that's really proper or not. HI-39 HI-40

And then one of the charts that was up HI-41

said that under impacts to burrowing owls the only alternative that had loss of habitat being significant for burrowing owls, was alternative four. Well, I contend that any development on Bayview is a degradation of burrowing owl foraging habitat. And so that the only alternative that doesn't have significant impact to burrowing owls is three, which is no development on Bayview. HI-41

And I second the idea that paying for parking isn't going to fly. And having people and housing next to wetlands is going to degrade the wetlands. And it's a big mistake. Thank you. HI-42 HI-43

MS. LOCKYER: Thank you.

MS. MORRISSEY: Thank you for your comments. In terms of the Bayview area, we have the loss of upland habitat there. There is something that will occur when the housing is built.

However, we have taken care of in alternative five to preserve a fairly large amount of open space, and a large amount as a burrowing owl preserve. Those are managed differently from a wildlife habitat standpoint.

The burrowing owl is typically like a sharp grass. And other birds like a longer grass habitat. So there is a mix of habitat uses being preserved there.

The impact of the loss of the upland habitat has been analyzed by a biological resource expert. Jones and Stokes are the consultant that we used as well as by our burrowing owl expert Dr. Lynne Trujillo from San Jose State and they have all come to the conclusion that building the housing out there is not going to have a significant environmental impact.

We're also consulting with the U.S. Fish and Wildlife service. They'll be out here for a site visit next week. And we've prepared a biological assessment that looks in detail at the species that use the habitat. And we've come to the conclusion in the biological assessment that there's no significant impact.

So there's a difference between an impact and a significant impact. We're not saying there's no impact. But the conclusion is that there's not a significant impact.

VOICE: I would like to follow up and

HI-44

ask, I read the environmental assessment, and the burrowing owl assessment, and it talks about significant impact. And nowhere does it quantify what a significant impact is. And so to me, it's -- it's very nebulous when you can say, well, there's going to be an impact, but it's not significant, so everything is fine.

I don't understand how you get away with that.

MS. MORRISSEY: From talking to Dr. Trujillo, we agree that a significant impact would be if over a three-year period there's a -- there's a statistically measurable decline in the burrowing owl population, when compared to the burrowing owl population in the South Bay at other areas where like San Antonio open space, other areas where there are burrowing owls. Because there will be variations in population of a species from year-to-year due do a variety of factors.

So we do have a built-in monitoring to determine whether or not there's a decline in the population. If there would be, then we would have to take additional measures to provide additional habitat, to provide additional buffer.

H1-44

Other measures to reverse that and to ensure that we don't have a decline in the population of burrowing owls.

VOICE: How do you do that once it's already built on?

HI-45

MS. LOCKYER: Actually, I would like you to go to the microphone if you want to make a comment. Thanks.

VOICE: When it's all the built out, how do you provide more habitat?

HI-46

MS. MORRISSEY: Even with the amount of development that we've proposed. There is a significant amount of land that's not being developed. There's the whole golf course area on the east side. There's the area around the airfield. And the areas that we're setting aside are the areas where the burrowing owls now live.

The only owls that would have to be moved to accommodate the proposed development is a couple of pairs just south of hangar one. And those would be moved just a little further south into that area.

What we have actually done is drawn the preserves around where the owls live. So we're not planning on, other than those just south of

the hangar one pairs, we are not planning on moving any of them to accommodate the development. That's where they live now. That's where they will continue to be able to live. With a buffer around them.

From speaking with Dr. Trujillo and her analysis, the 81 acres is a good amount of habitat for that population of owls. In addition, there's a number that will continue to nest around the edges of the golf course as they do now. That won't change.

In addition to the formal preserves, there are owl protection zones where the owls currently forage. And like the golf course also in the recreational areas north of the 85, 120-foot intake, those will be designed so the owls can continue to forage around the edges of those.

So we feel it is a well-designed plan. We have worked with the leading ecologists in the area to develop the plan.

MS. LOCKYER: Let me just get to some comments from someone else, and you are welcome to continue.

Where is all the money coming from to

HI-47

fund the many construction projects?

MS. MORRISSEY: The new construction in the development plan will actually be funded by our partners. There would be no NASA funds on the development of the construction in those areas.

HI-47

MS. LOCKYER: And then a related question. Will any money be syphoned or taxed from research funds? I'm assuming for the development of the research park in this project.

HI-48

MS. OLLIGES: Well, right. That would be the same answer, that the funds for the construction in the NRP would be coming from the partners who are interested in partnering with us and building on the site.

MS. LOCKYER: Is there a link between the Bayview housing and a proposed Olympic Village if San Francisco gets the nod for hosting the Olympic games?

HI-49

MS. MORRISSEY: The housing that the Olympic Village, the Olympic committee has proposed for the Olympic Village, I believe is the housing, it's the Army land now. NASA hasn't been talking to the Olympic committee about putting housing on their property for the

village.

MS. LOCKYER: And then there's two questions that are related.

Why will NASA be denied the use of Bushnell Street to include the sidewalks. Bushnell is the main east-west street to the gate. Why is the priority to the research park? HI-50 HI-51

MS. MORRISSEY: Oh, I think I touched on this a little bit. We did do some traffic studies on where the gate -- where the fences should be located and how the new gates will affect the traffic. And it has to do a little bit with queuing. We want to queue up the cars and make sure that we have enough room for the cars to queue up at the gates so we don't affect the traffic flow in either area.

MS. LOCKYER: What happens to building 19? Will they still contain NASA offices? HI-52

MS. MORRISSEY: Right now, yes. The building 19 will continue to house NASA personnel. I believe the long-term plan for the center is to try and phase some NASA people that want to be behind the gate to go to buildings that are behind the fence.

MS. LOCKYER: I only have one more

question, so send up your card, or come back and make a comment if you wish to follow on, or you haven't yet made a comment that you want to make.

The last question I have is: How is it that highway 101 traffic won't be made much worse? HI-53

MS. MORRISSEY: The Highway 101 traffic will be made worse. We will have a significant impact on the Highway 101 traffic.

MS. LOCKYER: Oh, yes, please.

VOICE: Oh, I was just going to say, that as an environmentalist I really applaud the green building and the solar panels idea as well as the water utilization. The reutilization of the water. I think that's awesome. And I'm just totally surprised because I didn't know this was going to be happening in my neighborhood. HI-54

And also the housing on site sounds like an amazing idea. And as a parent, I'm just really excited that my children are going to have the opportunity to utilize this collaborative research facility. And it makes me really glad to own land in this area. Thanks. HI-55

MS. LOCKYER: Are there any more

HEARING 1
NASA Ames Research Center, Monday, December 3, 2001.

H1-1: The Draft is available on the Internet and at Mountain View and Sunnyvale libraries. Copies can also be requested from NASA by contacting Sandy Olliges at 650-604-3355.

H1-2: The housing to be built under the NASA Ames Development Plan would be built by others, not by NASA. No new legislation has been sought.

H1-3: Background growth at study intersections was assumed to be two percent per year for the first three years and one percent per year for the next 11 years, based on projections from the VTA travel demand model. Growth in freeway volumes was factored at a rate of 0.5 percent per year. The transportation analysis in the EIS examines the increase in traffic as compared to the baseline condition but does not compare the ratio of project-generated traffic to background traffic growth over the next 13 years.

H1-4: This is an introductory comment which includes an opinion about how EISs are developed in general. No response is required.

H1-5: Comment noted. Construction plans would include safety plans that address the safe passage of bicyclists, pedestrians and cars.

H1-6: In order to encourage the use of bikes in the NRP, roads would be built to accommodate bike lanes. The lack of bike lanes on the architectural renderings is an oversight by the artist. Qualified engineers will design bike lanes.

H1-7: The commentor is referring to a statement on page 3.3-28, which has been modified in this Final EIS to clarify the meaning of the statement.

H1-8: Please see the responses to Comment 13-3.

H1-9: Please see the response to Comment 21-6.

H1-10: Please see the response to Comment 10-2.

H1-11: This comment expresses an opinion about parking fees. No response is required.

H1-12: Please see the response to Comment 66-4.

H1-13: This comment summarizes comments H1-6 through H1-12. No further response is required.

H1-14: Comment noted. The commentor supports the research park, but expresses some general uncertainty about Alternative 5. No response is required.

H1-15: Please see the response to Comment 16-10 regarding why Mitigated Alternative 5, with its use of Bay View for housing, is the Preferred Alternative.

H1-16: Please see the response to Comment 27-5.

H1-17: The commentor states that he had difficulty reading the DPEIS on line. The EIS was also available on CD-ROM and as a hard copy. Anyone who requested a copy was sent one, and it was also available at local libraries.

H1-18: The EIS acknowledges on page 3.9-5 of the DPEIS and page 3.9-46 of the FPEIS, that least terns and other sensitive species have been recorded in areas in and around the salt ponds near the Bay. In addition, the EIS also acknowledges on page 3.9-5 in the DPEIS and page 3.9-5 of the FPEIS, that the California clapper rail has been

observed in Stevens Creek, approximately 0.2 kilometers (0.1 miles) from Ames Research Center. No documentation of California clapper rails breeding in Stevens Creek was found. As discussed in Chapter 4.9 and Appendix E, the implementation of the proposed action, including appropriate mitigation measures, would not significantly impact these species because they are located a substantial distance from Ames Research Center and because changes in storm water volumes and quality would be minimal.

Cumulative biological impacts as a result of the proposed action are discussed on pages 4.9-15 through 4.9-18 of the EIS, which state that the majority of development associated with the NADP would occur on existing developed lands. In addition, development proposed in the Bay View area would avoid or mitigate impacts to special-status species and sensitive habitats that occur there. Sensitive habitats that occur in the North of Bay View area would be protected and preserved for wildlife use as well.

H1-19: See response to Comment 26-18.

H1-20: The Charleston Bridge is not proposed as part of the NADP. The depiction of the bridge on Figures 2-2 through 2-5 was an oversight and has been removed in this Final EIS.

H1-21: The commentor draws attention to developments in other parts of the region. No response is required.

H1-22: This comment expresses an opinion about the adequacy of a no-pet policy in the proposed housing development. Such policies have been effective in other housing developments near biological resource areas. In this case, it should be especially feasible to enforce a no-pet policy since all residents will be employees or students affiliated with NASA or its partners.

H1-23: There will be a NASA security fence between the housing and Ames campus. NASA security would prevent anyone from climbing on the fence, which would be topped off with roll wire to prevent avian predators from perching on it. The roll wire would also discourage climbing.

H1-24: Please see the response to Comment 16-10.

H1-25: The new security fence is not part of the proposed project. The fence was constructed in order to preserve the security of the Ames Campus. The location of the fence was determined through engineering studies. The fence location took into consideration traffic studies for both the Ames Campus and the NASA Research Park. The existing sidewalks were preserved and their location relative to the fence provides safe passage for pedestrians in both the NASA Research Park and the Ames Campus. No change was made to the existing accommodations for bicyclists.

H1-26: As stated in the EIS, no changes to the golf course are planned under any of the alternatives.

H1-27: The board of directors for the California Air and Space Center (CASC) is currently in the process of completing a feasibility study and development plan for the CASC. It is possible that the CASC could open in five to ten years, depending on the amount of funding available for the project.

H1-28: The commentor appears to be asking about the amount of project traffic added to the study freeway segments. As noted in the Appendix B of the FPEIS, the various alternatives of the proposed project are expected to add volumes that represent between 0.26 and nearly 14 percent of each studied freeway segment's capacity depending on the project alternative. The project-generated freeway volumes under the Preferred Alternative (Mitigated Alternative 5) are estimated to range

between 0.15 and to 3.42 percent on nearby segments that are operating at LOS F. For external segments, the range is 0.1 to 1.6 percent.

H1-29: According to NEPA, NASA is required to describe all impacts of the proposed NADP, and to implement all reasonable mitigation measures to reduce those impacts. For example, in order to reduce impacts to the regional air quality, traffic and jobs-housing balance, NASA has included mitigation measures such as a TDM program and on-site housing in the NADP. Despite these mitigation measures, some impacts of the project may be determined to be significant. However, under NEPA, a project with significant environmental impacts may still be approved if it fills an overriding purpose and need established by the federal agency.

H1-30: Children living in the proposed housing would attend school within the Mountain View-Whisman School District and the Mountain View-Los Altos High School District. Section 4.6.B.4 of this Final EIS includes a revised assessment of impacts of the NADP on these school districts, and finds that although the project exceeds existing capacity, no significant impact would occur because the developer of the housing would pay an impact fee to the school district to cover the cost of additional classrooms.

H1-31: Please see the response to Comment 37-4.

H1-32: Traveling from the Stevens Creek Trail to NASA requires access through property that is not controlled by NASA. Past requests for bike access through that property have been denied. NASA will continue to work with the property owners in order to try to obtain better bike access to Ames from the Stevens Creek Trail, but this is not a part of the NADP and its analysis is not required in this EIS.

H1-33: Housing within the proposed development would be open to anyone who works within or attends school in the development area.

H1-34: The proposed architectural look for the NASA Research Park has been developed to be compatible with the Spanish Colonial look of the Shenandoah Plaza Historic District. In addition, NASA wanted a style that would wear well over time. Within the Historic District, the goal is to mimic its existing open feel with low buildings, large set backs and materials and colors that are consistent with the historic buildings for any new structures there. In the remaining areas, NASA expects to create a more urban feel that is accessible to pedestrians and not designed as much around automobile users.

The artist's concepts the commentor may have seen are simply one interpretation of these goals, more of which are spelled out in the NRP Design Guide. The Design Guide discusses the quality of materials to be used, the sustainable design features which must be incorporated, and the varied façade and setbacks that are needed to meet the objectives of the design.

H1-35: Comment noted. This comment states an opinion only. No response is required.

H1-36: Please see the response to Comment 3-2.

H1-37: Comment noted. This comment states an opinion only. No response is required. There are currently over 5,000 people and Mitigated Alternative 5 would add another 7,088 employees and approximately 3,000 students.

H1-38: This comment reiterates points made in the DPEIS. No response is required.

H1-39: Please see the response to Comment 61-2.

H1-40: NEPA anticipates that some mitigation measures may create impacts of their own, which are referred to as "secondary impacts." It is commonplace to identify such secondary impacts and to mitigate them.

H1-41: Please see the response to Comment 21-38.

H1-42: Participation in the TDM program would be required of all partners in the NADP area. It would be a mandatory condition of development that AVR goals are met.

H1-43: The impacts of allowing people to live and work near wetlands, as proposed under the NADP, are examined in Section 4.9 of this EIS.

H1-44: As required by law, the EIS defines a standard of significance for each type of environmental impact that would result from the proposed action. This standard is the line above which an impact is considered significant and below which it is not. Some of these standards can be easily quantified, such as the decibel levels above which an action would be considered to have a significant impact. Other standards are not so easily quantifiable, such as those dealing with obstructing view corridors or disturbing habitat. NEPA does not provide a set of standards of significance that can be applied to all projects. Instead, the standards are defined in detail in each section of Chapter 4 of this EIS. Standards regarding biotic impacts, which include impacts to burrowing owls, are found on page 4.9-1.

H1-45: Even with the amount of development proposed in the NADP there is a significant amount of land that would remain undeveloped, including the golf course in the Eastside/Airfield, the areas around the runways, the open space in Bay View, and the 33 hectares (81 acres) being set aside for burrowing owl preserves. Since the preserves have been located where the owls currently live, impact to their habitat is minimized.

NASA has worked with Dr. Trulio, a leading biologist specializing in burrowing owls. Her analysis shows that 33 hectares (81 acres) is an appropriate amount of habitat for the number of owls living at Ames Research Center. However, if monitoring shows an impact to the owl population then additional safeguards on how the habitat is handled will be implemented. The nature of the additional mitigations would depend on why the experts think the owl population has been effected. Different vegetation could be planted, other measures to discourage predators could be implemented, or additional measures could be taken to limit interaction with the new employees.

H1-46: Even after buildout of the NADP, significant tracts of undeveloped land would remain at the Ames Research Center. If needed, portions of this land could be used for burrowing owl habitat.

H1-47: New construction under the NADP would be funded primarily by NASA's partners, with limited funding from NASA itself for projects to be used by NASA. The partners would finance their own construction and would participate financially in the construction of new joint-use infrastructure and in the operations and maintenance of the research park.

H1-48: No money would be diverted from NASA's research funds to pay for development of the NRP.

H1-49: There is no link between the housing NASA is proposing to build in Bay View and the Olympic Village that has been proposed for Moffett Field by the Olympic Committee. The Olympic Committee has been working with the Army to plan for housing on the Army's property immediately adjacent to the Ames Research Center.

H1-50: The fence relocation is not part of the new work being studied under the EIS. However the fence does define the border of the NRP with the Ames Campus and the Eastside/Airfield. The sidewalk along

Bushnell was left on the NRP side of the fence because the other side of Bushnell does not have a sidewalk. Within the Ames Campus there are plenty of walkways for pedestrians to get between buildings.

H1-51: No particular preference was given to the NRP during the design of the fence.

H1-52: Under Mitigated Alternative 5, Building 19 would be used primarily for housing, with some offices either for NASA or one of its partners. See SOCIO-1b.

H1-53: As stated in the DPEIS, the proposed project would have a significant and unavoidable impact on Highway 101 traffic. The Preferred Alternative would account for approximately 3 percent of the traffic on nearby highway segments that are operating at LOS F.

H1-54: The commentor applauds the sustainable-design aspects of the proposed development. No response is required.

H1-55 The commentor applauds the inclusion of housing in the proposed development. No response is required.

not going to start until we get a few more cards. You must have some comments and questions.

All right. Why don't we go ahead and get started. I do have a few cards. While once we have begun, if you think of something you would like to say or something you would like to ask, just fill out a card and wave it around and someone can come and pick it up.

The first card that I have says, "I am very pleased that our commissary and PX were able to stay open after the closure of NASA at other all locations. I am aware there was no federal agency to take the property and these resources were lost. What will happen to these stores under this development?

H2-1

MS. MORRISSEY: The development as you can probably see, based on our plans -- can everyone hear me? I guess you can't hear me.

Under our new plan we are planning to use the research to convert the areas where the commissary exchange are now, those buildings to research and development facilities. So they will need to be relocated. I know that JAPAK has looked at relocating the commissary. I don't

think there is a specific plan now for that. But they will have to be relocated based on what we plan to use it for the research and development park.

We have accommodated the trips and the traffic for the commissary exchange in our numbers. So you can still remain on site, not just in the areas where they are now.

MS. LOCKYER: Our first speaker is Gus Anderson. And because we are such a small group I will just have everyone stand up where they are and kind of project so that everyone can hear the question.

MR. ANDERSON: My question involves the military housing area to the north of 101. And I know there's been a lot of study of the impacts on the surrounding environment. Has anyone looked at whether there is any impact, what it might be to those -- I guess it's probably a hundred or so families living in that area, perhaps more.

H2-2

MS. MORRISSEY: Yes. We did look at the -- study that impact both from the traffic impact standpoint. Would the traffic essentially be impacting the Bayview area? Would that be

considered a significant traffic impact? Will the noise from the traffic as well as the traffic itself?

And came to the conclusion that the amount the road would be able to accommodate it adequately so it would not expect a significant impact on the residents in those housing areas.

MS. LOCKYER: Those are all the cards I have.

Oh, this is the U.S. Air Force, has force protection issues.

VOICE: U.S. Army.

MS. LOCKYER: Oh, the anonymous card says U.S. Army has force protection issues. How is this going to be addressed with the U.S. Army in the open area?

H2-3

MS. MORRISSEY: Well, my understanding is that NASA has been working with people who will be located in the public areas. So the Army, you know, one of the groups will be outside the public area. Be working with them. They will have to make separate accommodations if they want to increase the security of those sites.

So in other words, if they need to

build a new fence, something like that, have to work something like that out, we will have increased patrols in the area. NASA will continue to patrol the area and maintain its security force, you know. It will be an additional burden on the security when it's opened. But beyond that we are not doing any exchanges.

VOICE: Can I follow up with that, since I wrote that card? You said build a fence. Are we on the hook for that if a fence were to be built around there?

H2-4

MS. MORRISSEY: Right now there's no plan for NASA to build additional fences.

VOICE: OK. Even though NASA changed its requirements with this open area concept?

MS. MORRISSEY: That's an ongoing discussion that we haven't resolved as yet. It will continue to be looked at.

MS. LOCKYER: OK. Moving towards that are there any other cards?

VOICE: I have got a comment. A caveat.

MS. LOCKYER: All right. Fill out a card.

VOICE: OK.

Well, I have many comments then, so I will just give you a card and --

MS. LOCKYER: OK.

VOICE: -- and then I will just make my comments because it's a multitude of them.

I am Still Waters, I am the deputy commander on the seventh site group located here on Moffett Field. We adjudicate foreign policy objectives worldwide, in case you don't know that. And we're currently adjudicating them on several continents. H2-5

I've got some general comments. And you guys all know me. We have had these discussions before. But I would like to bring these out into a public forum.

On the security issue, to answer your question, a definite dot yes, we're going to be on the hook for that one. We're going to be outside the wire. Which I have already -- which prompts a question from me, or just a general comment. H2-6

If security is not of concern where you guys are building the fence in this open campus environment.

Because of course we can all dance around the fire and sing Kumbaya, and no one is going to have a security issue.

I think in retrospect, after studying this issue, we're going to have a much larger -- because I know that you're purchasing more security for this facility, and it's going to cost more in the long run. Instead of keeping up the status quo and perhaps having people that visit here, visiting luminaries and people who are going to study here, to participate in the same security procedures. H2-6

I think that because of the events that you have witnessed in the last few months, and having spent some time over there, these guys are bad guys.

My question or maybe statement in general is why build this thing here? H2-7 I understand that you guys did a great study. You guys have conducted a wonderful study. When I go to foreign countries and I have to determine if we're going to introduce U.S. Virus, so to speak, into their society, I have to go through some study. And in the end I have to present to the commander, the pros and cons of this. And is it H2-8

actually worthwhile to introduce the U.S. into that culture? H2-8

Have you looked at all alternate sites? For example, why not build this thing in Alabama, where land is cheap and plentiful -- resources are plentiful, in Huntsville where labor is cheap and they are craving jobs there. We are down to Harriland if that area land is pretty inexpensive. And there's a lot of it. And in the local universities. Institute of Technology is there, as are several major universities who do aerospace studies. H2-9

So why are you trying to cram this into this area when there's other sites available?

And what I am looking at the overall concept here in the scheme maneuver. There's a lot of things that don't make sense to me.

Did you ever see the movie Dune, talking about the decrease in water quality or increase in water quality, going to consume less water. You are going to have to have some kind of down suits out there to do this. If you bring -- if you're introducing seven and a half people into the environment. But I'll discuss that with you later. H2-10

And where are you going to build this housing? Isn't that going to impact on the total infrastructure? And we'll use this word, the symbiosis that we had with the community as well. H2-11 H2-12

MS. LOCKYER: Why don't I stop you there, because you have thrown out a lot of concepts and maybe get some responses to some of those.

VOICE: I am just letting you know what I am thinking about and having you think about. And I hope you guys are thinking about it too.

And I hope I will -- I have opened a few new views into your thought process, because I think this is -- I think it's doable. But the way you are going about it is not. It's -- it's not in concert with us. H2-13

MS. LOCKYER: Our court reporter is recording all of our comments, so you can continue if you like.

VOICE: No. I think I have expended as much energy as I can on that. Thank you.

MS. LOCKYER: Did you want a response now or mainly just letting us know your opinion?

VOICE: I was just venting. But in a

public forum.

MS. LOCKYER: No, I appreciate that. I appreciate that.

Thanks for your comments.

VOICE: Could I ask for a response to part of his question, the issue of security? I am -- I am interested as to why reducing security risk inside the open campus area such as --

H2-14

MS. MORRISSEY: Building a fence so we can have public access and exchange with NEPA and with our partners so we don't have to bring in and design a security fence. That is to create an open atmosphere.

It's also a chance to bring in the public and to show them what we are doing to have an educational outreach and public involvement in science and exploration. That's part of why we are opening the campus.

But we also looked at a fence because obviously NASA has some research going on that they don't want to have people wandering around for safety reasons, as well as security reasons, into their facilities. And instead of card-keying those buildings, NASA made a decision to just move the fence line back. Be able to

achieve both objectives with that.

MS. LOCKYER: I have a card from Chaplain Walls. Remember to fill out a card, if you would like. And --

VOICE: I just wondered if you had heard of Covert Towers. I mean, security fences like what you are putting up only work for people who want to stay out. The fence line is right next to the building. H2-15

MS. MORRISSEY: I think security issue is something we will continue to study as time goes on by.

MS. LOCKYER: Chaplain.

VOICE: I have a serious home area with this area in here in particular. That's an area that's designed as housing.

MS. LOCKYER: Yes.

MS. MORRISSEY: That's correct. H2-16

VOICE: Will there be any separation between the university housing and the military housing community or will it be open free access between the two?

MS. MORRISSEY: Right now it's designed to be open community areas.

VOICE: What was your answer to that?

MS. MORRISSEY: I am sorry. This is designed to be open. There will be no barrier between the housing now that's on site and the university path.

MS. LOCKYER: All right. Those are all the cards I have.

Although you have lots of opportunity to make both a spoken comment if you would like or a written comment. You can turn in your comment cards at the welcome table. Or as Sandy mentioned, you can e-mail us directly.

We will be preparing responses to all of the questions and comments we receive. We'll also send a copy of the final EIS to everyone who submits a written or spoken comment. So please do comment.

We also have three other public hearings scheduled just like the one today. So you can think about what you have heard today, come back, hear it again, and maybe comment then.

The next public hearing is tomorrow from one to four, the same time. But it's in the Visitors Center. So it's outside the gate. It's open to anyone. It's in our special event room.

The next public hearing is Wednesday night in the Mountain View City Council Chambers. And it's actually from 6 to 9:30 in the evening. The address there is 500 Castro Street.

And the last public hearing is Thursday night in the Sunnyvale City Council Chambers. That address is 456 West Olive Street. And that's also from 6 to 9:30. So please do come. Tell anyone you know that might be interested to come. And thank you for coming today.

VOICE: I have a question for you. First of all comments. Great coffee. Thank you very much for that you serve cookies at these. H2-17

MS. LOCKYER: You are going to come anyway.

VOICE: It might help us get into a better frame of mind.

The question I have is: Once you have conducted these EIS surveys, these surveys -- and I am sure you have advertised this already to the public and let them know the various meetings around here, that this is going to occur, what is your process then? What do you -- which hurdles and bars to get over based off of these comments coming from the public at large in order to H2-18

accomplish your objective?

MS. MORRISSEY: So what we do, based on the comments, address each one. The comments that are substantive comments that are within the scope of the project, there's actually has something to do with what we are proposing. All those comments have to be addressed in the final EIS. We answer the question or we show how they described the impact. There's an additional mitigation that we can do until we accept that. So we have to somehow respond to all of the comments.

H2-18

EPA, federal EPA is also reviewing the document. They'll look at it both in terms of the adequacy of describing the impacts, whether or not they can understand what we are doing, what the impacts are, and what the mitigations are, and that will get our media going to achieve a reasonable degree of mitigation. And they will assign it a rating. It has to be above a certain level to be an acceptable document.

VOICE: What is the criterion then, because it sounds pretty narrow, are you saying it's solely environment?

H2-19

MS. MORRISSEY: Right.

VOICE: The environment can impact on other things. For example, psychologic environment here right now is that people are concerned about security. I am just using that as an example.

H2-20

Security is a psychological impact indicator as to how people perceive this project. Will that be included as one of the criterion or is that already out?

MS. MORRISSEY: That's outside the scope of an Environmental Impact Statement because Environmental Impact Statement looks at the effects on the physical environment.

NEPA does extend it to look at things like housing, the fiscal impact on cities, the impact on the services. So it extends it into the human environment and that extent. But it does not require us to look at every single aspect of the human environment.

It's the areas that I went over, the air quality and water quality, et cetera, the traffic, those are the areas.

VOICE: And the economic impact?

H2-21

MS. MORRISSEY: The economic impacts and then this information is made available to

the decision-makers. As soon as our director -- to take into consideration as they decide to go forward, if they decide to go forward, that's documented in the record of decision along with accompanying mitigation implementation plan that says how we will do the mitigation, who will do the mitigation, when each mitigation step will take place, et cetera.

Once we have signed that record of decision documenting the decision and admitting to the mitigation measures, we go forward from there.

VOICE: OK.

MS. MORRISSEY: That's about it. The process.

VOICE: Thank you.

MS. LOCKYER: Thanks. We really do want your feedback. So please provide it to us. Thank you.

(The hearing was concluded at 3:03 p.m.)

HEARING 2
NASA Ames Research Center, Monday, December 10, 2001.

H2-1: Please see the response to Comment 3-2.

H2-2: The impacts to the families living in military housing adjacent to the project were studied and the results are shown in the impact discussion sections of Chapter 4 of this EIS. Section 4.3 discusses traffic impacts to military families. Section 4.4 identifies air quality impacts. Section 4.6 discusses service impacts on military families and other residents. Section 4.10 identifies noise impacts to these groups, while Section 4.11 discusses impacts to aesthetics. Section 4.12 identifies impacts to recreation for military families and other residents, and Section 4.14 identifies socio-economic impacts on these segments of the community as well. All of the results show no significant impact except for the general ones in the region of increased freeway traffic and related decrease in air quality.

H2-3: NASA has been working with its military tenants for over a year to smoothly prepare and transition to the new security arrangements. There have been numerous briefings and meetings to ensure that the Army and other military tenants are prepared for the new security arrangements. NASA will continue to provide security in the NRP. The Army may undertake additional security measures, such as erecting its own fence and increasing its own security patrols.

H2-4: The Army would be responsible for the cost of building an additional security fence if it chose to do so.

H2-5: This is an introductory comment. No response is required.

H2-6: Creating an open campus environment is necessary and key to creating the NASA Research Park. The open campus allows public access so that the NASA Research Park partners can freely conduct research

interchanges with NASA scientists and engineers. The partners would build research and education facilities that support the NASA Ames Development Plan goals. The open campus also opens opportunities for science and technology education.

Building a fence around the Ames Campus is a necessary and cost effective measure. As an operating research center, there are research facilities that pose safety risks to the public. These include high-pressure systems, high-voltage systems and rotating equipment, to name a few. The alternative to the security fence would be securing each individual building and each individual research facility.

H2-7: NASA wants to build this research park here because this is where NASA Ames Research Center is located. The scientists and engineers from Ames already work here and live in the area. The Bay Area's residents represent one of the most highly educated populations in the country. In addition, there are many talented local companies and universities who are interested in participating in the park. NASA feels that NRP would be well-located to form partnerships with entities engaged in cutting-edge information technology, nanotechnology, and biotechnology research.

H2-8: This is a general comment not related to the adequacy of the DPEIS. No response is required.

H2-9: NASA is looking at multiple sites for research parks or other collaborative spaces at sites affiliated with other NASA centers. Each of these centers would take advantage of local expertise and have specific areas of research they are interested in pursuing. At Kennedy Space Center, for example, NASA is working with the State of Florida to establish International Space Research Park. In Alabama, Marshall Space Flight Center is establishing the National Space Science Technology Center in Huntsville. In Virginia, NASA Langley

Research Center is looking to set up the National Institute of Aerospace near its site.

H2-10: NASA plans to conserve water in the implementation of the NADP by using reclaimed water for irrigation and industrial boilers and cooling towers, by installing low-flow fixtures in all buildings, and by landscaping with native plants that need little irrigation.

H2-11: Housing would be constructed in the least contaminated sites: Bay View and in Parcel 6 in the NRP.

H2-12: NASA has studied the amount of additional traffic and utility demands that would be created by the housing proposed under the NADP. These impacts are described in Sections 4.3 and 4.5 of this EIS.

H2-13: This comment states an opinion only. No response is required.

H2-14: Please see the response to Comment H2-6.

H2-15: Please see the response to Comment H2-6.

H2-16: There would be open access between the university housing and the military housing areas, unless the military constructs a fence.

H2-17: This is a general comment not related to the adequacy of the DPEIS. No response is required.

H2-18: Substantive comments received during the public review period that are within the scope of the project are addressed in this Final Programmatic EIS. Thirty days after the Final EIS is completed, NASA would issue a Record of Decision.

Also, the US Environmental Protection Agency (EPA) has reviewed the DPEIS and evaluated its adequacy. The EPA has assigned it a

rating of EC-2. For more information, please see the response to Comment 2-3.

H2-19: The commentor is correct in assuming that the criteria for evaluating the project under the EIS are environmental. Socio-economic considerations may also be examined in an EIS under NEPA.

H2-20: The commentor is correct in stating that "environmental impacts" can extend beyond the physical environment to the human environment. While NEPA does require analysis of socio-economic and public-service impacts, an EIS is primarily intended to examine impacts to the physical environment. Some impacts to the human environment, such as psychological impacts, are beyond the scope of an EIS.

H2-21: Economic impacts are discussed in Sections 3.14 and 4.14 of the EIS.

will be from Jay White, followed by Tom Bryant. Is Mr. White --

JAY WHITE: Yes. My name is Jay White. I'm the President of the California Pilots Association. And the main mission of our association is preserve the air transportation system within the state, particularly the airports. H3-1

In listening to presentation here, I missed any references to the use of the facility for air transportation. If may be soon that the operation will continue as they are now. And that may -- might have work all right, but the thing I see missing here is planning for the future in that in my view, based on the partners, the institutions and other organizations that will be using the facility, there's going to be a great need for air transportation. H3-2

Throughout the state now we're seeing a big increase in the use of business aircraft, like corporations and other businesses, small jets and turbo props. And it's already happening because of the deteriorating airline service and the need for further transportation.

And so I see it, it's these institutions that will be using the facility are going to be

using the general aviation jets and other airplanes for their transportation purposes. So I think that needs to be considered in your plan for increased traffic. H3-2

And the significant is that you need to plan for compatible uses of the land around the airport. Historically what happens is that residential developments are allowed to encroach on the airport, and then if there is an increase in traffic, the people who are living there are going to be very concerned adversely affected by the noise. H3-3

So planning needs to take place with the surrounding communities to make sure that the land around the facility remains compatible with the continued operation.

And I did not hear anything mentioned in your review. In my view that is something that really should be (inaudible). Thank you.

MS. LOCKYER: Thank you. Tom Bryant.

TOM BRYANT: I really have three questions.

The first is the TDM program. I saw two different statistics. It's a little confusing. The EIS talks about a, I think it's (inaudible) trip reduction, or a TDM reduction of 22 percent. I H3-4

thought in another slide it was a 46 percent reduction in trip reduction, so I really don't understand that. H3-4

And the other question is in the EIS the terms about traffic circulation. Within the city of Sunnyvale there's certainly a belief that for (inaudible) what it was, but the Mary Avenue extension needs to happen. So again that's particular to traffic in -- involved with 101 to Central Expressway. It's clearly adding (inaudible). I'd like to understand the rationale or logic of why this project doesn't (inaudible). H3-5

And by the way, it's a great project. It's well done. H3-6

MS. OLLIGES: Well, thank you. Thank you. The TDM, the 22 percent -- the 22 percent TDM reduction is from the actual Transportation Demand Management measures, like you pay for parking, the shuttle, the bypass, the Ecopass program.

The additional 23 percent TDM reduction is due to the on-site housing. So the people, in order to be qualified and live in the on-site housing, the people will have to be working here or attending classes here. So those rush hour trips would not occur, because people would be already here on site and would use the on-site shuttles, the bypass or

the pedestrian pass.

So that's the 22 plus the 23 to get to the 46 percent overall reduction if you include housing as part of the TDM.

As far as the Mary Avenue overcrossing goes, we did -- the traffic consultant did look at a number of the intersections in the Sunnyvale area at Sunnyvale's request, including Mary at Central, and the implementation of alternative five would not cause a significant impact on any of those intersections.

MS. LOCKYER: I'm going to read a couple of the cards I have, but don't forget, if you've got a card to just hold it up. We've got a couple people that are collecting them.

This card I have actually asks three questions. What is/are the basis for the population housing, et cetera, for the development? Is there a ratio that needs to be maintained? H3-7 H3-8

What is the basis for the population housing, et cetera, for the development? Is there a ratio that needs to be maintained? Population housing ratio.

MS. MORRISSEY: Yes. I think, the way we put together the numbers for the population -- I'll stand so I can see all your faces.

The way we put the numbers together for the population was the use factors. Obviously at this point we don't know exactly how many people will be on-site living and working here, so we used most of the Association of Bay Area Governments to look at what the projected number of people would be on-site. And yes, we do want to keep a good balance between housing and employees on site, as an important factor for our partners as well.

MS. LOCKYER: During the construction, will the constant pounding and excavating drive away the burrowing owls and other wildlife? How can this be minimized? H3-9 H3-10

MS. OLLIGES: Generally, except -- most of the construction will not be occurring near the burrowing owl preserves. There's preserves in each of the areas. The Ames campus, the Bay View area and the east side air field, there will not be any construction occurring around those burrowing owls preserves.

There will be some construction occurring around -- occurring around the burrowing owl preserves in the NASA Research Park, but it will be of a temporary nature. And what we've observed with the burrowing owl populations that are here is they

actually adapt very well to a noisey environment, as long as you don't allow the construction traffic to actually run over them or run into their nesting area.

So the area itself will be very carefully controlled. We will not allow the construction workers to stage, you know, piles of dirt there. They will not be allowed to park their construction equipment in the owl preserves, or anything like that. The preserves will all be fenced off to protect it. And the owl seems to be very tolerant of loud noise levels.

They live near the airfield here and in many other places where they have survived as well. The Aircraft noise doesn't seem to bother them.

MS. LOCKYER: Will the community be able to use the facility?

H3-11

MS. MORRISSEY: Actually, you can see on the map behind me where the new fence line is that we're actually changing right now. And you can see that the NASA Research Park itself will be outside of the secured area, as well as the area where housing is in Bay View. So those will be open to the public.

MS. LOCKYER: Our next speakers will be Robert Lennox, followed by Lenny Segal.

ROBERT LENNOX: Thank you. I had a chance yesterday to read the EIS plus your presentation today. I wanted to congratulation the team first of all. It's obviously a very well thought out and professional presentation, so my congratulations on that. H3-12

I know Ames has a significant history in the area. And all of us -- I'm a pilot -- who are in the aviation industry (inaudible) the work that has been done here is ongoing, and I'm very excited about the research park. I had a couple of comments. H3-13

In the video you mentioned the history of the field. I think it's important to remember that in 1933, Hangar Number One was built to house the Macon. And in 1936, when the Macon crashed, the Navy said well, we don't need Moffett any more, so they left. H3-14

On December 7th, 1941, the Navy came back. They needed an airfield. They were here till '96. They decided it was now surplus, we didn't need the airfield any more. So we're in the situation where we are today.

My crystal ball is not as clear as the lovely presentation we had there with the children 20 years out. I simply want to make sure that the infrastructure which is here in place, which is -- it H3-15

cannot be reproduced anywhere else in Northern California, remains intact, because we don't know what we'll need in the future.

So the runways need to stay. They're a very important part of the Bay Area. H3-15

To piggy back a bit on what Mr. White had to say, I'm a little concerned about a new housing development, simply because housing is an incompatible land use with an airfield. So you can mitigate that to some extent with soundproofing, with agreements where the folks move in, they recognize that there is an airport there, but basically it's an incompatible land use, and I encourage you to work harder on your TDM so that we can reduce the housing near the airfield. And let's still minimize the impact of the commute traffic. H3-16 H3-17

I think that's about it. Thank you very much. It's been an excellent presentation. H3-18

MS. LOCKYER: Thank you. Lenny Segal.

LENNY SEGAL: Yeah, I'm not going to make any comments today, but I have a question on something I looked for and couldn't find or see in the EIS. Do you have any data on the elevations of the property, particularly on the Bay View parcel? H3-19

MS. OLLIGES: I don't have the elevations,

you know. I can't just read them off to you. We do have that data internally. We can get it for you. The Bay View parcel is within the flood plain, and that is identified in the documents.

So in order to build the housing there, we would bring in import fill as is described in the (inaudible) EIS. I don't have in mind the exact, you know, elevation.

LENNY SEGAL: If the Bay View parcels were not diked and pumped, it would it be a wetlands? H3-20

MS. OLLIGES: It would not be a wetlands, no. It's an upland area. It just within the 100 year flood plain, so there's a difference between being in a flood plain and being in a wetland. It's not a wetland. It is in the hundred year flood plain.

LENNY SEGAL: The EIS says the floods occur more often than 100 years. That's part of my (inaudible). H3-21

MS. OLLIGES: Very small portions. Not in the Bay View area, but at the northern end of the some of the runway areas, there is some standing water from time to time. But that's why we add the fill. But it's not classified as a wetlands. We did have Jones and Stokes (phonetic) come in, resurvey for wetlands.

We submitted that to the Corps of

Engineeers. They verified and accepted that identification of all the wetlands. So the wetlands have all actually been identified. None of the development will occur in any wetland area.

MS. LOCKYER: I have two more cards to read, but that's it. So if you're thinking about either making a comment or submitting a card, just let us know so we can collect them. And there is one up here.

Have you studied developments planned by the adjacent cities? In so, how does your development compare to theirs in the areas of housing and traffic impacts?

H3-22

MS. OLLIGES: We did -- we did look at the development that the cities have planned, and that -- that's what the cumulative impact analysis is how -- that's what's taken into account at the cumulative impact analysis.

So you'll see in the EIS there's a table of a number of development projects that are planned and approved both within the City of Sunnyvale and within the City of Mountain View.

How they compare, it's hard to say. There's -- I -- just from what I can recall, we're building more housing than what I see proposed in any

of those lists of development projects. So I think in that -- in that sense, we compare favorably.

Our TDM programs, as far as I know, are much more robust as well. So in that sense, I think we compare favorably also.

MS. LOCKYER: This sounds rather self-serving, but this card says I think it is a very well thought out plan. H3-23

Our next comment is from Ted Scarlet.

TED SCARLET: Yeah, my name is Ted Scarlet. I've lived here basically my whole life. I am a pilot. I own an aircraft. H3-24

As a citizen, I have a couple of concerns. I have a question. Where do you think the people are come going to come or live that are going to work here at this facility? And you know, I don't know what cost or price you're going to be putting on the housing, but realistically I don't think too many people are going to be able to afford that. H3-25 H3-26

I think that you're going to see people coming from as far as Tracy or the Central Valley, and this is going to be a significant traffic impact. H3-27

On the other hand, it's a great plan, and I'm sure, you know, this will be great to have this in our community. H3-28

There was no mention about (inaudible) current workforce. I mean, you talked a lot about children and opportunities for them in the future, but what about all the people that already reside here? The technology is speeding up. Is there going to be facilities with aid and retaining and redeploying of the current workforce? H3-29 H3-30

There was no mention of power demand. And what, if any power, are you going to generate for yourself? H3-31

And then back to the issues as a pilot. I am disappointed that there hasn't been more thought into -- this airfield I see in the future would be of major -- of major importance in the overall transportation for Northern California, maybe the state. And I'm just really disappointed that you're not recognizing that a lot of people that work for NASA, a lot of people that live in this area are pilots, and they're a part of the community I think is being left out. Thank you. H3-32

MS. LOCKYER: Thank you.

MS. MORRISSEY: I just want to clarify on the airfield use. It will remain a limited use federal field. That's what our plan is right now for the future.

And I also want to touch a little bit on a couple of points that you asked about. We are bringing in the educational component, and part of that will be undergraduate or graduate students, but it will also be a chance for people to tune up their skills in new technology. That's part of what our plan is. It is really to do workforce training.

And then I also wanted to touch a little bit, you asked about power demand, and we are going to use some green type of solar and that kind of thing. We have no plans to do power generation on the site here.

MS. LOCKYER: Is there anyone else who wants to make a comment today?

All right. Well, thank you very much for coming. We really appreciate your feedback. Don't forget to turn in your comment cards either at the table on your way out, or you can mail them back to us by January 28th. You can also send your e-mails directly to NASA with your comments or questions. The e-mail address is researchpark, one word, at arc.nasa.gov. And everyone who signed in today will be automatically placed on our mailing list for notice of the final EIS.

And finally, there's two more public

HEARING 3
NASA Ames Research Center, Visitor's Center, Tuesday, December 11, 2001.

H3-1: This is an introductory comment only. No response is required.

H3-2: Please see the responses to Comments 4-8 and 19-3.

H3-3: Regarding the compatibility of airfield use with adjacent uses, please see the response to Comment 19-3.

H3-4: The TDM reduction for all project alternatives is 22 percent. The 46 percent reduction refers to the total reduction for Alternative 5, including Mitigated Alternative 5, which also includes a 24 percent reduction of peak hour trips due to on-site housing.

H3-5: Please see the response to Comment 73-2.

H3-6: This comment expresses an opinion in favor of the project. No response is required.

H3-7: Table 2-3 of the EIS shows the main assumptions used in projecting the NADP residential population and employment. In addition, Section 4.14 outlines the methodology for projecting the housing demand created by the NADP.

H3-8: This comment appears to refer to a "jobs/housing" ratio. The "jobs/housing" ratio refers to the relationship between growth in employment and housing stock to meet the demand for housing generated by new employment. The Executive Board of the Association of Bay Area Governments adopted its *A Land Use Policy Framework for the San Francisco Bay Area* in July 1990 that contains the following definition:

> "Jobs/Housing Balance: The coordination of housing and job opportunities which takes into account the availability of transit, as well as land use mix, housing prices, job categories, worker skills and the historical role of a city as a "bedroom community." The primary objective is to reduce auto trips and auto congestion by providing the opportunity for workers to live close to job sites or to transit. This approach can improve regional mobility as well as impart a stronger sense of community."

Across the region, it would generally be ideal to have a one-to-one balance between jobs and employed residents. Since there are about 1.4 to 1.6 employed residents per housing unit, a jobs/housing ratio of 1 to 1.4 or 1 to 1.6 would be ideal. However, it is impossible to set target ratios for specific projects. Applying the regional one-to-one target would be impractical at the local agency or project level, since conditions related to zoning, land use, adjacent densities, topography, land values, and other physical and environmental constraints vary widely among agencies and land parcels. Nevertheless, NASA acknowledges the policy goals of the Bay Area's regional planning organizations in favor of a jobs/housing balance, and has responded by providing 1,930 housing units within NADP areas.

H3-9: No construction is planned near the burrowing owl preserves in the Ames Campus and Eastside/Airfield areas. Construction in the NRP and Bay View areas would be kept 76 meters (250 feet) from an active nest during nesting season, and 49 meters (160 feet) away from an active nest outside of nesting season. The California Department of Fish and Game Guidelines (See the Appendix F of the EIS) state that these are distances at which an impact is not expected to occur.

H3-10: Please see the response to Comment H3-9.

H3-11: The NASA Research Park and the Bay View housing districts would be outside the relocated security perimeter and would be accessible to the community.

H3-12: This comment expresses an opinion only. No response is required.

H3-13: This is an introductory comment only. No response is required.

H3-14: This comment summarizes the history of the airfield. No response is required.

H3-15: Please see the response to Comment 4-8.

H3-16: Please see the response to Comment 19-3.

H3-17: The DPEIS establishes an aggressive but achievable TDM program to achieve its trip-reduction goals and minimize the impact of the commute traffic. The ability of employees and students to commute to the NRP using alternative transportation, such as walking, biking or taking an NRP shuttle is an important aspect of the TDM program. The availability of on-site housing will greatly facilitate the use of alternative transportation. NASA is evaluating all possible locations for the on-site housing.

H3-18: This is a closing comment. No response is required.

H3-19: The information requested is as follows:

- Mean Sea Level: 0 meters (0 feet).
- Stevens Creek Levee: 5.5 meters (18 feet) near Building 267, 6.1 meters (20 feet) near Western Diked Marsh, 7.3 meters (24 feet) near Bay View low lying area.
- Levee north of Retention Pond: 1.5 meters (5 feet).

- Retention Pond: 0.5 meters (1.5 feet).
- North Perimeter Road: 1.7 meters (5.5 feet).
- Eastern Diked Marsh: 0.5 to 1.1 meters (1.6 to 3.5 feet).
- Western Diked Marsh: 0.5 to 1.5 meters (1.5 to 4.8 feet).
- Bay View: 1.5 to 3.3 meters (5 to 11 feet).
- Bay View existing roadway at south end: 4.1 meters (13.5 feet).

H3-20: The Bay View parcels are currently located in an upland area. The historical tide limit is marked by the northern boundary of the Bay View area.[12] Therefore, historically, the Bay View parcel was likely a mix of native grassland, upland scrub, and scattered seasonal wetlands. Because the historic tide limit occurred north of the Bay View parcel, no permanent wetlands likely occurred on the site.

H3-21: Bay View is within the 100-year flood plain. However, fill would be placed in the area where residential development would occur to bring the elevation about the 100-year flood plain.

H3-22: Cumulative impacts from the NADP alternatives combined with other projects in the vicinity of Ames Research Center are addressed throughout the EIS. Chapter 2 lists the cumulative projects that were considered in the EIS. The list includes planned and approved projects within the cities of Mountain View and Sunnyvale. The analyses presented in Chapter 4 address future cumulative conditions with these cumulative projects. Table 6.4-1 of the EIS provides a summary

[12] Goals Project. 1999. Baylands Ecosystem Habitat Goals. A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. First reprint. U.S. Environmental Protection Agency, San Francisco, Calif./S.F. Bay Regional Water Quality Control Board, Oakland, Calif.

of those issue areas under which the implementation of the NADP Preferred Alternative would result in environmental and/or cumulative impacts.

H3-23: This comment expresses an opinion only. No response is required.

H3-24: This is an introductory comment. No response is required.

H3-25: NASA expects that the NRP would employ many people from local universities students, teachers, and recent graduates. NASA also expects to draw from the extremely talented pool of employees that currently live in the area. It may be that NASA would attract to the NRP visiting students, faculty and interested researchers.

H3-26: The housing analysis in Chapter 5 in this Final EIS includes an analysis of likely NADP employee and student incomes vis-a-vis likely prices for NADP housing. It shows that incomes would support the types of housing proposed.

H3-27: Regional traffic and housing impacts of the project, including impacts on areas such as Tracy and the Central Valley, are assessed in Sections 4.3 and 4.14 of this EIS.

H3-28: This comment expresses an opinion only. No response is required.

H3-29: NASA anticipates that its educational partners would provide programs to train the existing local workforce to employ new technologies.

H3-30: There would be an educational component to the NASA Ames Development Plan including undergraduate and graduate student education as well as technology skills training.

H3-31: Power requirements of the project are addressed in Section 4.5 of this EIS. NASA would not install any power generating plants under the NADP. However, the sustainable design provisions of the NASA Research Park Design Guide for development at Ames Research Center emphasize the installation of energy efficient building systems and controls, energy conservation, and the utilization of solar and other renewable energy resources. Implementation of these provisions would minimize electricity consumption and avoid any significant impact relative to electricity use.

H3-32: Please see the response to Comment 4-8.

me to read the card. There's coffee and cookies outside. Let's take a ten-minute break, and we'll get started at 7:40.

(Recess was taken.)

MS. LOCKYER: -- have a card, don't forget to hold it up, and someone will come around and collect them. I just ask when I call your name that you go to the microphone, and again limit your comments to three minutes just so we can make sure everyone gets a chance.

And if you're wondering why we're not scribbling notes here, we've got someone recording the entire meeting, so we will have a copy and a record of your comments.

The first speaker is Mark Christenson, to be followed by Libby Lucas.

MARK CHRISTENSON: I guess that's not working. Well, I came in here sort of all fired up and expecting to tell you all how irresponsible you were to put housing in the back of the property where people could be trapped in the event of a natural disaster or industrial accident or terrorist attack, but the provision of the (inaudible) pretty much squelched that. H4-1

And I'm glad to see that you're preserving a

fair chunk of the Bay View area as open space. But I do have a couple of other concerns. H4-1

One is the proposal to add -- to add 12,000 square feet for the control tower. The field is very limited in use now, and it sort of makes the question of what you plan to support with all of that facility. I only hope it's not opening the door for the sort of airfield use that sparked so much controversy years ago. H4-2

Also, I had an observation about the acreage, the demand anticipated for recreational acreage. You have about 20 acres demand and about 35 acres of new recreational fields. I'd propose that maybe 15 remaining acres could be retained as open space. H4-3

And I have to gather my thoughts here for a second. All right. Well, I guess since I spaced out on it, I'll yield the balance of my time. Thank you.

MS. LOCKYER: Thank you.

MS. MORRISSEY: I just want to clarify a little bit on the control tower. We aren't planning to build anything new or any new square footage of the control tower. It's really just to relocate that function to the far side of the field. It would remain the same use as we have now, the

airfield itself.

MS. LOCKYER: So we have Libby Lucas, followed by Jeffrey Plaza. You can just come around in front, that's okay. And I think the microphone's working if you pull it down.

LIBBY LUCAS: Thank you very much. I guess just as a quick go around on the wildlife habitat, I would appreciate it if you were meeting with some of the U.S. Fish and Wildlife personnel on some of the birds species that are available in the wetlands. But since you're not essentially impacting them with this alternative five, I guess that can happen at any time.

H4-4

But I am concerned about the burrowing owl habitat, because when you did your burrowing owl count, it looks like it's down to about a quarter now of what it was two years ago. So something has happened to impact the number of burrowing owls. And -- pardon me. I'm still eating my cookie and drinking my coffee.

H4-5

I think that besides the nice report that you have, I think an ongoing association with a couple of specialists is mandated, because I think that sort of loss -- initially it was supposed to have been 120 pairs of burrowing owls in this area. This was

considered the base population for the entire South Bay that was holding, you know, within some capability of reproducing itself. So to drop that down to the, I guess there were 18 observed on your most recent report. Well, that's a big drop. H4-5

So I certainly hope that something is done in the next two years. Pardon me, I'm still working on my coffee.

I think that that whole area over to the right of the southeastern section looked like it was a very prime area for the burrowing owl habitat, and I think maybe that needs to be looked at again, besides the areas you've set aside, because I think that's where most of your population has been that has been identified. H4-6

And then the other point I guess is the new housing over there in Bay View is right on top of Stevens Creek, and I think it's important that you haven't upset that, because there's a recreation trail there, and you have flood control problems. H4-7

Then I guess the rest of it is just the other waterways, like the Marriage Road (phonetic) ditch and the North Channel, are very important from the standpoint of wildlife, and it's important that the water quality be good survival -- good quality so H4-8

that you can have the frogs and all the other little salamanders and everything else that exist in those channels. Thank you.

H4-8

MS. OLLIGES: (Microphone feedback.) Sorry. I'm awake now. Let me just respond to some of the those comments.

The 120 pairs of owls is the population in the entire South Bay. That's never been the population at Moffett Field. Unfortunately, the population in the entire South Bay is down to 120 pairs.

At Moffett Field, we have around 20 pairs, and it vacillates, it always has, between 20 to 25 pairs per any given year. And so that's about, you know, around a fifth of the population in the entire South Bay. We do have the largest population of any one place anywhere in the South Bay, and we do carefully work with an owl ecologist on a regular basis and would continue to do so through -- you know, on an ongoing basis.

That's built in as the mitigation to have a monitoring plan and insure that the development is not impacting the owls. And so we will have this ongoing relationship with the burrowing owl ecologist as you have suggested, as we do now.

The other area that you mentioned for the burrowing owl habitat, which I think you were referring to this area in the southeast corner, which is the area where the California Air National Guard is, that burrowing owl habitat will remain. Their -- California Air National Guard area is not part of our development area. They have their own environmental assessment, and they're developing their own burrowing owl management plan. So although we hadn't identified a preserve there, the burrowing owl habitat there is being protected.

Then you talked a little bit about the housing along Stevens Creek. There is planned to be 100 foot setback, and that's even further from Stevens Creek. That's from the -- from the road. So it's even going to be more than 100 feet from Stevens Creek. Then there's a large levee separating that even from Stevens Creek.

Fish and Wildlife was out at the site today looking at that, and they'll determine if that's enough of a set back. If not, you know, we would increase it to 200 feet, or as they recommend, to prevent any impact to the wildlife that do use the Stevens Creek corridor.

For flood control, the Bay View area is go

to be filled to bring the level up above the hundred year flood plain. So that will be dealt with as well.

The other areas that you mentioned, Marriage Road and the Northern Channel, there's really no development planned in that area. That's going to stay as is, so we wouldn't expect any impact from the development there.

Thank you for your comments.

MS. LOCKYER: Yes, thank you. We'll now have Jeffrey Plaza followed by Briggs Nizbit.

JEFFREY PLAZA: I'd like to address all of you guys. My concerns are to both the public and to NASA. I'm a Corporal in the United States Army, and I'm pretty concerned with what's going on.

H4-9

As a member of the Armed Forces, we're not opposed to development at Moffett Field. In fact, we think some development or a lot of development would be good. It would provide more infrastructure.

The thing that we do lack, however, right now is the ability to work with NASA as we decided -- as we did in the past. When we first -- when NASA first took over, the Army was funding some of the repair and refurbishment of some of your resources, that we might use then in conjunction with our own

H4-10

aerospace program. But at such a time that didn't really pan out, and that money just kind of washed away.

Now, being that the Naval Reserve has left, that's put a lot of our units in jeopardy. We've got at least a special forces unit there that I could let you know about. We've got sci ops (phonetic) units, and all of them are involved with this current operation. We've got a drill sergeant battalion, which I am currently a part of. We've got the 129th, which is actually over here, and there is a air control tower. H4-10

The 129th, however, is out of country with all of their planes, so a lot of things are happening while they're gone, and their families are paying the prices. And it's not necessarily NASA's fault, but it's something that does need to be looked at.

It's more than NASA. It's our politicians. It's the way that we've run things, business as usual, and it's not okay.

So currently right now you've got housing right here. You've got housing on post right here, and most of the military usage runs up along this back fence. There's a field over here. H4-11

There's some buildings in that area also

that NASA has taken over. We had single soldiers living there, and NASA decided let's kick them out. And our units had to respond. Our units had to say well, where are we going to put these soldiers? And it was for the better. They got to live somewhere better. But the point is something could have been done slightly better. More communication could have happened to allow the transition to take place.

H4-11

Our -- my -- my unit, the special forces unit, and a number of other units are right in this area. When the fences come down, that poses a big security risk to the City of Mountain View, the City of Sunnyvale and to your establishment. Once people find out that our facility is open and that they can come in and do whatever they please, that's not good.

When the President flew into Moffett Field numerous times during the last administration, there was heightened security. And with the fence up, that was at a higher level than it is now. When the fence comes down, where's that security going to be? How are we going to really have that airfield as secure as we'd like it to be?

H4-12

I don't know about the proposal for the hangars over here on the backside, but the 129th uses those at a limited capacity right now to repair their

planes and their helicopters. Our equipment can't sit out for the public to see. A lot of it's classified, just like your planes are classified. And I believe all your planes are located in Southern California now. So, you know, I'd like to see this re-evaluated as far as how you work with the military and their families.

H4-12

There's a number of facilities there for the families that aren't being used. The rent's so high that the military in the small organizations that they are, can't afford them. So until the public is able to let their people know, let their representatives know that they want their military taken care of, then none of that's going to change.

H4-13

So I urge you to write your representatives. I have. And I urge you to really consider what's happening now with the military, because we'd really like to work with you, but, you know, personally I wouldn't want my arms unit open to public. You know, I don't want them to be able to come and take my weapons. I don't have time to guard my weapons 24/7 with an armed -- a sidearm. I don't have that time. I've got to do my job first. I've got to do the mission that I've given by the military. So --

H4-14

MS. LOCKYER: Thank you for your comments. We'll have Briggs Nizbit followed by Lenny Segal.

BRIGGS NIZBIT: Well, first I'd like to comment, it's been mentioned that alternative five has the least impacts, which may be true for the entire development plan, but it's pretty obvious to me that alternative five has actually the greatest environmental impacts as regards the loss of open space and potential endangered species habitat, and that's because it appears that all of the new development as opposed to -- excuse me, redevelopment is going to be occurring on the Bay View parcel, whereas, for instance, alternative three does not have any development on the Bay View parcel at all. H4-15

And relevant to that, I have a question which is that on several occasions and in the documents, it's been mentioned that housing is short-term, and I would like to know that what the definition of short-term is and how you would describe the housing that is proposed for the Bay View parcel. For instance, is it student dorms, faculty-student housing, apartments for the general public? You know, in what specific way would you characterize that? H4-16

And further, how does that address the jobs housing imbalance in the region? H4-17

MS. OLLIGES: I'll make sure that's turned down before I turn my mike on this time. In terms of the loss of open space, it's true that alternative three has less development in the Bay View area, but alternative five has less development than either alternatives two or four.

Alternative two had been our previous preferred alternative. Alternative five increases the amount of open space in the Bay View by decreasing the amount of proposed development in the Bay View. That's the area that we feel is most suitable for housing.

The types of housing that's proposed out there would be a mixed use, but probably most of it would be townhoused style housing, a fairly dense development, 750 units on about 25 acres. It would be for students and faculty, people that are either working or going to school at the NASA Research Park Ames campus. It would not be open to the general public.

In terms of how it addresses the housing jobs imbalance, I know Trish had a chart on that. I don't remember the exact number, but it did make the jobs housing imbalance impact considerably less by adding the additional housing.

MS. MORRISSEY: Yeah, i think we mentioned that we still will have a jobs housing imbalance, but the ratio of jobs to housing from alternative two was at almost 18, and it goes down to six in alternative five.

I also wanted to mention that in alternative five we actually add open space to areas fully developed right now. And so we do gain some open space by that alternative.

MS. LOCKYER: Next we have Lenny Segal.

LENNY SEGAL: Good evening. Oh, well. Good evening. Though I've always thought that the kind of educational partnerships that NASA envisions for this plan are an excellent idea, I think NASA has a long way to go to devise a plan that would not have a severe impact, as you say, significant and unavoidable impact, on our communities in terms of the traffic, the housing, the air pollution.

H4-18

The fact that of the alternatives that you list, this is the one which seems to do the least to make the house -- jobs housing imbalance worse. It doesn't mean you've gotten there yet. I'm going to try to make just a limited number of points tonight to reinforce that comment.

H4-19

The first is that the total number of jobs

that you list as associated with this plan do not include the jobs which have not yet been created on site as part of your baseline.

For instance, you have Lockheed building a 600,000 square foot building, I assume pretty much the same intensity of use as the other buildings that are going to be there. That will generate 2,000 more jobs under the formulas that you're using, somewhere around there. That's not included in the number, the lab space you're talking about. H4-19

Perhaps the increased intensity of use that we've seen in other buildings in Silicon Valley without any new construction, that also is not calculated. So the net impact on the jobs housing imbalance, which you already say is significant and unavoidable, is actually going to be a lot worse in the long run than what you're projecting in this report.

And I actually would suggest that that is an oversight, that you use cumulative figures when you do your traffic analysis, but you do not use cumulative figures in your socioeconomic analysis, and you should do it that way. H4-20

Second point is, Sandy just said, 25 acres for the housing, I read the footprint was 18 acres. H4-21

If it's 18 acres, it's 40 -- over 40 units per acre. If it's 25 acres, it's about 30 units per acre. That's a very high density for this area. I don't know of housing in this area that's been built at that density. You could say maybe college dorms could be built at that density. I know my daughter is at NYU in New York, and they're at that density, but UC Santa Cruz, which is I guess who NASA hopes will build this, is much less dense than them.

And I would suggest that even though you're talking about 750 units there on that small -- relatively small portion of the Bay View parcel, when push comes to shove, and someone actually looks at how they're going to build housing that people are going to move into voluntarily, they're either going to have to reduce the number of units significantly or increase the footprint.

H4-21

Now -- and that's already a bad place to put housing because it's in the Bay's flood plain. It's adjacent to the wetlands. It provides uplands habitat, which is scare throughout the Bay Area.

H4-22

You talked about the open space that's part of -- being retained as part of the Bay View parcel. But a lot of that is the area that's right by the intake to the wind tunnel where you can't build

anyhow, and that is not adjacent to the principal habitat area.

So I fail to see why this housing is really going to be built given the environmental constraints, the fact that you need to fill soil, add up to four and a half feet of soil, to bring it up to elevations where it's not likely to be flooded. I just don't see it happening.

So I would suggest that if you really want to go ahead and provide not 7,000 jobs, but maybe 10,000 jobs as part of this plan, if you include the cumulative impact, you're going to have to work a whole lot harder to find a place to build housing. H4-22

You're going to have to find a place to build housing which is closer to the transportation networks, closer to the freeway, closer to Light Rail. If you don't do that, then we'll all be sitting in traffic in 10 or 15 years saying who the hell thought this was a good idea? It's nice that a lot of good research is going on here, but I can't get home in the afternoon. Thank you.

MS. LOCKYER: Thank you for your comments.

MS. OLLIGES: I'll respond similar to -- to some of the comments, anyway. I just want to say that we did look at the cumulative effect when we looked at

housing. We looked at the baseline as being what's existing, plus what's proposed under the already approved projects that Trish had mentioned. That's the baseline plus what the Kang is building.

So the baseline did include all that, and then we added our proposal, alternative five, to that and then plus we added all the demand for housing that would come from the project's proposed by the City of Sunnyvale and Mountain View. So the whole housing analysis did indeed look at the cumulative impact of development that is proposed through 2013 in the housing impact areas I had shown on my charts.

As far as open space being adjacent to the wetlands, alternative five does leave some of the upland habitat adjacent to the wetlands. This whole area here is open space. This is the wetlands, and this is the wetlands, none of which is being developed. This is adjacent to the wetlands. This is also open space adjacent to the wetlands. It's set aside as a burrowing owl preserve, but it is indeed open space.

The other comment that I'd like to respond to is the transportation for the housing. The transportation demand management program will include on-site shuttles that will run very frequently between

the housing areas and the NASA Research Park. There's Light Rail right here. We already have a shuttle that runs to the Caltrain in Mountain View. That -- the frequencies of those will also be increased. Plus there will be bicycle and pedestrian paths from the housing down to the development. So there will be a lot of alternative transportation infrastructure created as part of alternative five.

Thank you.

MS. LOCKYER: I'm going to read a couple of the cards I have before we call the next speakers.

This says why can't you put all the housing you need in the NRP area?

H4-23

MS. OLLIGES: The primary reason is the NRP area is underlain by the Superfund sites. Some of you are probably more familiar with it than others, but this is Highway 101, of course, and this is the Mountain View-Ellis-Whisman Superfund site. And the groundwater flows north this way under this -- most of this area.

And the Navy is also a Superfund site there. The Navy contributed contamination also in this whole area, so there is a Superfund site plume under there. So we've sited the housing over here, this is like the edge of the plume adjacent to the

existing military housing, which is here.

So we kept housing in that area that's not over the most highly contaminated portion of the plume. The plume is being remediated, and perhaps sometime in the future, when the contamination levels drop, you know, additional housing could be built in some of that area. We just don't feel it's prudent at this time to put residents and children, you know, potentially at risk to exposure in that area.

At the Bay View site on the other hand, there's no Superfund site out there. It's relatively clean, so we feel that that's more appropriate for housing.

MS. LOCKYER: The next question is related. What options are available for using the military housing that is not currently being used?

H4-24

MS. MORRISSEY: Well, we discussed with the military using their housing. We actually right now have access to twelve of the units in the military housing for NASA's purposes and NASA's contractor's purposes. But they of course have their own rules for that space and have been working towards potentially privatizing that area. Although we continue to talk to them about the housing.

MS. LOCKYER: Our next comment will come

from Dr. Philip Cosby followed by Cynthia Parton.

PHILLIP COSBY: Hello, my name is Philip Cosby. I'm a member of Peninsula Interfaith Action of St. Anthanasia's (phonetic) Church here in Mountain View.

H4-25

We represent 1,100 families in our community and I'm here to -- actually ambivalent, because as a research physicist, I'm excited that we're going to have this -- this research park development combining technology and science and education.

But as a concerned member of the community, I'm aghast that we're adding so many jobs and so few housing. I complement NASA on increasing the jobs housing ratio during the course of this study. And it looks good. It's a good ratio. But nevertheless, we're going to have to support 4,394 new residents in that this area. Over the past ten years, Mountain View has added approximately 15,000 new jobs and built approximately 1,000 units of new housing.

H4-26

The effect of that has been enormous. Enormous increases in the rents, enormous increases in the price of housing. Rents have more than doubled. The effect of this increase in rent has been to drive many of the lower paid workers out of our community, not just further away from work to have to commute,

but actually out of the area to have to find new jobs, new schools, new everything. Now we're going to add 4,500 more, and the effect can only be to drive the rents up even higher.

We've talked about a negative disproportionate impact on low income people, but the effect, the increased demand for housing in fact produces a disproportionate effect on the lower income people. They cannot afford to pay the higher rents. H4-26

So I ask you to consider other options here, to build more housing. To ideally take care of all the increased employment with new housing. I mean, after all, this was a military base when it was brought into this area at the time. Almost all the employees lived on the base. That's changed over the years. But nevertheless, we can't absorb many new employees now. Perhaps building on the golf course might be a desired option. Perhaps tearing up the runway might be a desired option. H4-27 H4-28

So I ask you to think more about housing. Thank you.

MS. LOCKYER: Thank you. Cynthia Parton.

CYNTHIA PATTON: Patton.

MS. LOCKYER: Patton. I apologize.

CYNTHIA PATTON: Is that working?

I'm Cynthia Patton. I'm the restoration manager at Save the Bay, and I was here yesterday and saw your presentation then as well. So I've watched the video twice now, and what struck me the most is that when I use my time machine upstairs, I guess I have a much grander vision for Moffett in 20 years than apparently NASA does.

I have a vision it involves Mountain View and Sunnyvale reclaiming their bay front and growing in a healthy and sustainable way. And while I commend NASA for doing a much better job in alternative five than I feel was originally proposed in the first four alternatives, I think there's still plenty of room for improvement. H4-29

The video talks a lot about planning for the future and becoming a world class center. It talks about creating a cutting edge development plan. But frankly, you know, it strikes me that this proposal is really pretty much business as usual in Silicon Valley.

What NASA's proposing is a staggering amount of new commercial development in a city with a very modest mount of short term housing in a region that's been plagued for years with chronic housing shortages. And that's pretty much a recipe for H4-30

skyrocketing traffic congestion, decrease in air quality and spiraling housing costs, which is stuff that we've all seen for the last decade or more.

And this is just not sustainable in the long run. So I guess, you know, what I'm trying to say is that, you know, my vision and Save the Bay's vision would be that we, you know, for once try to change that.

H4-30

You know, high quality employees are drawn to this region because of the quality of life here, and the San Francisco Bay does play a large part, you know, in that. But so does the ability to buy a house that's within a two or three hour commute of where you work. And I think it's getting increasingly difficult for people that live, that work in the Silicon Valley to find -- to find housing that they can afford here.

H4-31

You know, with each new research park or high tech campus that's built with inadequate and inadequate housing to match that, more people are forced into outlying areas, such as San Joaquin County, which incidentally I found curious that your figures, when you showed where people are coming from, didn't even mention. I know there's a lot of people that drive on 580 and over the Sunol Grade, and yet somehow those people just fell out of your figures.

H4-32

As -- as a region, I think we just really need to decide once and for all if we want to become like LA, which is pretty much sprawl over everything, and be stuck in our cars for, you know, hours every day or if we want to, you know, envision a different kind of future for ourself that utilizes true smart growth principals and preserves some of our remaining open space and natural resources. And I would hope that NASA would choose to create a development plan that is as cutting edge as the research that they hope to be conducting in this research park. H4-33

And just to conclude, I want to say that, you know, one of our -- actually, we have two really major concerns with this proposal besides just the overall issues of, you know, whether this is in fact sustainable to be doing these kinds of developments over and over again.

But in particular, we're concerned about the Bay View parcel and what's being proposed there in alternative five. While the Bay View parcel was not historically jurisdictional wetlands, it was historically moist grassland, which supported seasonal swales and wetlands in wet years. And seasonal wetlands and moist grasslands such as this are very productive habitats that can sustain large numbers of H4-34

shore birds and water fowl, particularly during fall and spring migration periods. And these areas are also increasingly rare habitats, because they are typically not afforded the regulatory protections that title wetlands are granted today.

So Save the Bay looks at the Bay View parcel as providing an ideal natural buffer between the urban development that's on the rest of the site at Moffett and the wetlands in the eastern and western dike marshes and beyond. Protecting this entire parcel from development by managing it as open space would increase species diversity both at Moffett and throughout the South Bay and help reduce human disturbance and other predator intrusion to the burrowing owls and to other species that are out using the wetlands. H4-34

Providing an adequate buffer zone is one of the habitat goals reports most important goals for the Mountain View sub region, and I think it's really -- that all of us should be looking at that and trying to find ways to incorporate those goals into development plans that take place particularly along the shoreline.

And then just lastly, placing a large amount of fill in this area to support urban development only H4-35

kind of compounds ours concerns about the issue. You know, my vision for save -- for, and I think Save the Bay's vision, and I think lots of people is that we're finally at a point in time where we're not constantly filling the Bay in order to provide areas for more development, that we should be doing that on, on solid ground if you will.

H4-35

So anyway, Save the Bay's vision for Moffett involves restored and enhanced wetlands, less Bay fill, improved water quality enhanced by a diversity and permanently protected open space. And we also envision increased public access to the Mountain View shoreline and the creation of more livable sustainable communities that improve the quality of life for humans and wildlife. And we hope that NASA can work with us and other groups to help make that a reality. Thanks.

H4-36

MS. LOCKYER: Thank you.

MS. OLLIGES: Thank you for your comments. I'll respond to just a few of them now, because they'll all be responded to in the final Environmental Impact Statement.

I just want to respond to your comment about the San Joaquin County being dropped out of the housing impact area. We did analyze that, and about

slightly over one percent of the commuters to Sunnyvale-Mountain View come from San Joaquin County. Slightly more than one percent come from Stanislaus County, and slightly more than one percent come from Santa Cruz County.

However, the ABAG information did not divide those counties into the districts as they did the more immediately surrounding Bay Area counties. Like within Santa Clara County, we had the Sunnyvale-Mountain View district, the Palo Alto-Los Altos districts. So we didn't have those districts, so we didn't have the information to know where that one percent was coming from within those counties, and we didn't want to spread the housing impact area out too large, because that would actually mask the impact on the more close end areas. But we did look at that. So I just wanted to mention that.

As far as an upland buffer, we do realize that that's important, and I do want to again point out that alternative five is leaving a large area of upland buffer. All of this area is being left as an upland buffer area adjacent to the wetlands.

As far as not having the humans disturb the wildlife and not having predators disturb the wildlife, we agree that's very important. The

security fence is being relocated -- there we go -- so that the housing will be outside the security fence, and that will protect all of this area which are seasonal dike wetlands, as well as this upland buffer area and burrowing owl preserve, from the increased population that would live in the housing.

In addition, we'll have a strict no pets policy there, as I had mentioned, because a lot of times when people have pets, those become predators of a lot of animals that live on the site. We'll also in our design guides, if you page through it, we're requiring that all the trash receptacles be animal proof because the animals have a sports of -- source of food, and they become predators like the raccoons and skunks and those types of animals, or if people feed animals on site, that increases the predator concentration, so we have a strict no feeding policy, no pets policy.

We have policies that reduce the number of predators of birds that live in the wetland areas. And those policies would continue to be strictly enforced.

Thank you.

MS. LOCKYER: I'm about to read my last card, so if anyone else would like to make a comment

tonight, hurry up and submit your card.

This question is: Will all housing be at market rates, and do you propose -- what do you propose for employees working in retail, service support and other non-technical professions? H4-37

MS. MORRISSEY: Well, all the details haven't been worked out on the housing. But again, it would be that housing would be built by one of our university partners, and they would run it similar to the way they run their other housing units. And it probably would not be at market rates. They would have some sort of a rate for their students such as a tiered structure rates.

Anybody who was working on site would be eligible for housing. We would have some sort of a prioritization system that would be implemented as part of that.

MS. LOCKYER: I think there's a few more comments, so now is the chance to think of anything else you'd like to say.

The next speaker will be Erica Caragouwan (phonetic). I'm sorry, that was awful.

ERICA CARAGOUWAN: No problem. My main question is regarding the traffic mitigation proposals and how firmly established they will be. I'm worried H4-38

that this to pay for parking, people will complain, and then they will remove this requirement. So I wanted to know how firm you'll stand in having all the requirements for parking and the traffic mitigation followed as proposed. Thank you.

H4-38

MS. OLLIGES: We're putting the transportation demand program requirements as an attachment to the lease that all of the partners would sign. They will be required to attain specific average vehicle ridership goals. And the pay for parking is one of the main reasons to -- the main methods by which those will be achieved.

So the way the TDM program is designed is that if the average vehicle ridership goal is not achieved, the price per parking actually goes up. And since NASA will sign the Record of Decision that we are adopting this mitigation measure, we will in turn require the partners to sign that they will indeed do that. So we intend to enforce it very strictly.

MS. LOCKYER: Our next speaker will be Mark Christenson.

MARK CHRISTENSON: Thanks folks. I remembered what I had forgotten earlier, and I also want to add the remarks that I forgot to add to preface my previous remarks.

MS. LOCKYER: Great.

MARK CHRISTENSON: In spite of the fact that you have this program in place, and you're going to be enforcing it, I think it's optimistic to think that you can mitigate 50 percent of the traffic impact. H4-39

What I forgot to say earlier and did want to say, is although I'm not completely thrilled with the plan, the preferred plan, I am glad, and I want to recognize that you did incorporate a lot of the public comment. H4-40

I think the museums and public outreach in education are great. They're a perfect part in NASA's -- NASA's mission. And I think all the high tech research and the astrobiology is great, but just hope that our concerns, remaining concerns are addressed. H4-41

Thank you.

MS. LOCKYER: Thank you. Looks like our last speaker will be Jeff Plaza.

JEFFREY PLAZA: I don't really want to bring up anything I haven't already spoke on. But I do want to ask a couple questions about like the fence line and like if any -- if anyone here on either side has any questions about the military side, I would be willing to answer those on a limited unofficial basis. H4-42

So -- but as far as the fence line, the main concern that the military has is everything that we have is secure. And it seems like NASA is basically taking the position of let's take the fence down and spend -- I know you guys are spending upwards of a million dollars to put a new fence up, and then the military's going to have to front another fund to put some of that fence up, and I know NASA is going to put some of that fence up as well. H4-42

But that's only the airfield. There's a lot of other units located away from the airfield, and there's a lot of other resources that the military could use. We've got -- we're almost at full capacity in the housing, and the reason people can't live in housing that aren't military is because there's policies. H4-43

I'm sure the commander there would be more than happy to give you a certain number of houses, but it's based on Army policy. And so if you guys want that to change, then you guys have to change the minds of the people at the top of the Army making the policy.

So -- but in regards to that fence line, that causes major security issues. We can't do our job, so why are we -- why is that being overlooked, H4-44

and what is your -- your plan to fix that? We can't have open buildings and people need to have access. Military people need to have access to that area, not civilians. So --

MS. MORRISSEY: Well, for the fence, we've been thinking about moving the fence for a while now, and we have worked with the various military units that are on site. We do know that some of them will be outside the gate. This will not be the only facility where military will be outside the gate, and I know there are policies that they put into place to keep their facilities secure. And we have been working with the military units to help them make a decision about how they would like to keep their units secure in the new environment on the field.

We know that moving the fence is a very important component though, not just this project, but actually precedes this project. It's really the temporary space for the Computer and History Museum. It's the universities that are moving into Shenandoah Plaza. In order to really make those things happen, we need to have it open to the public. And this seemed to be the best way to make it happen.

JEFFREY PLAZA: Have you considered relocating and reconsolidating where the military's

H4-44

H4-45

at? I mean, that to me would seem like a pretty good idea. I know you guys are building part of the astrobiology building on the southeast side. Or is that -- so -- you say 129th is out there. 129th is a brand new building out there that the military funded. How about moving (inaudible) with the funds that have already been invested by the military those units to a place where they're out of your -- out of your concern where you can go ahead and develop as you want to develop and still allow them to keep their jobs.

H4-45

MS. MORRISSEY: Well, we're giving the military the option if they would like to rebuild on the far side of the field. We certainly can work with them on that. I mean, we have -- that's one of the discussions that we'll have with the different units that on site, what their choice is.

MS. OLLIGES: And we are in fact relocating the Air National Guard's motor pool to the east side. NASA is paying to do that.

MS. LOCKYER: Thank you for your comment. And thank you all for your comments. NASA really appreciates the feedback. We really appreciate you coming.

Don't forget to turn in your comment cards either on your way out or mail them back to NASA by

HEARING 4
Mountain View City Council Chambers, Wednesday, December 12, 2001.

H4-1: This comment expresses an opinion only. No response is required.

H4-2: The construction of the new air traffic control tower is planned simply for the purpose of moving the tower to the east side of the airfield, creating additional space to be available for the NASA Research Park. The new 1,100 square meter (12,000 square feet) control tower would be equal in size to its predecessor.

NASA Ames Research Center has no plans to significantly expand airfield operations. In fact, the NASA Ames Development Plan is consistent with the recommendations offered by the joint Sunnyvale/Mountain View Community Advisory Committee that was formed in November 1996 to study and provide input to NASA about the best reuses of Moffett Field.

H4-3: The commentor states that under Alternative 5, new residents and employees would generate a total demand for 8.1 hectares (20 acres) of new parkland. The anticipated demand is actually 7.7 hectares (19.2 acres), as shown in Section 4.12 of this EIS. The commentor is correct in stating that Alternative 5 would supply almost 14 hectares (35 acres) of new parkland, for a surplus of 6.4 hectares (15.7 acres). Mitigated Alternative 5 would also add new residents and employees, who would generate a total demand for 10.2 hectares (25.5 acres) of new parkland. Mitigated Alternative 5 would supply 14.1 hectares (34.9 acres) of new parkland for a surplus of 3.9 hectares (9.4 acres).

The commentor proposes that the surplus area be retained as open space. NASA disagrees with this opinion. Recreation areas are important amenities that would be used by NADP employees and students.

H4-4: NASA has met with US Fish and Wildlife personnel on the biological resources that live in the wetlands, and is preparing additional studies. Please see the response to Comment 27-7.

H4-5: Please see the response to Comment 21-38. There have never been 120 pairs of owls at Moffett Field. There are approximately 120 pairs in the entire South Bay. There are approximately 18 to 25 pairs at Moffett Field.

H4-6: The commentor appears to be referring to the CANG area which is not proposed for development under the NADP. Its development under the CANG EA is protective of the burrowing owl habitat within the CANG area. Please also see the response to Comment 21-38.

H4-7: The new housing in Bay View will not affect Stevens Creek or the Stevens Creek trail. Stevens Creek is separated from Ames Research Center property by a levee and a fence. West of the fence, a road separates the fence from the Bay View planning area. There, in the Preferred Alternative, the housing is set back from the road with a 61 meter (200 feet) buffer. The 61 meter (200 feet) buffer, plus the existing road, fence and levee prevent the housing from impacting Stevens Creek. See also the floodplain analysis added to Section 6.5.C of this EIS.

H4-8: Marriage Road Ditch and Northern Channel were both created to serve as part of a stormwater drainage system. The water within these systems currently supports hydrophytic vegetation, and therefore, does provide some value to wildlife in these areas. The proposed action would not alter the water quality or volume in these channels, thereby preserving their current wildlife value . In addition, measures to maintain and monitor high water quality in the stormwater drainage system have been proposed in Section 4.5 of this Final EIS.

A survey for special status amphibians, including California red-legged frogs and California tiger salamanders was conducted in June 2001.[13] None were found; in fact, the researchers feel that these species have been extirpated from Ames Research Center due to its separation from other populations of these species, and low habitat quality from high salinities in the soil and water. However, Pacific tree frogs and other common amphibians are known to inhabit the water ways at ARC, and Western pond turtles have been observed in the Marriage Road ditch.

H4-9: This comment expresses an opinion only. No response is required.

H4-10: There is a NASA liaison assigned to work with the military resident agencies so that open communication of issues can be readily accommodated. In addition, NASA participates in the monthly military affairs meetings to discuss issues of mutual and regional concern.

H4-11: There is military housing along R.T. Jones Road and adjacent to Berry Court. In addition to that housing on Moffett Field, the NASA Ames Exchange manages some temporary lodging in Building 19 and in Building 583. The military used Building 583 for several of their single soldiers until the Ames Exchange took over the facility. The Exchange asked the existing tenants to leave while they brought the building up to code. The lodging is still available for use by the military on a temporary basis under the operation of the Ames Exchange.

H4-12: Most of NASA's military resident agencies' property is in the Eastside/Airfield area. This area is still secure even after NASA's relocation of their fence. There are some military tenants within the

[13] Scott and Alderete, 2001.

future NRP area which is outside of the security perimeter. NASA is working with these organizations to find appropriate locations for their long term use that meets their security and space requirements. No security changes are planned under the EIS where NASA's military partners are currently located.

H4-13: This is a comment unrelated to the adequacy of the DPEIS. No response is required.

H4-14: Please see responses to Comments 3-4 and H2-3.

H4-15: Please see the response to Comment 16-10.

H4-16: Short term housing refers to housing that is leased for set periods of time (less than five years). See housing analyses in Chapter 5. References to "short term housing" have been removed from the EIS. However, the expectation would be that student apartment and dormitories might house students from six months to two years on average and that townhome and apartment units could be occupied by the same individual(s) anywhere from one to ten years.

H4-17: While NASA proposes to add to the region's rental housing supply, it does not propose housing for home-ownership. However, this housing still offsets the jobs/housing imbalance because there is a large demand for rental housing in the Bay Area.

H4-18: Please see the response to Comment 14-27.

H4-19: Lockheed's proposed project is under the CUP EA and is included in the cumulative analyses.

H4-20: As stated in the response to Comment 32-2, a cumulative analysis of NADP's housing impact is presented in subsection B.4 of Section 4.14 of the EIS.

H4-21: NASA projects the density of Bay View housing to be approximately 40 to 50 units to the acre. NASA is satisfied that units at this density are marketable to NRP employees, based on the fact that private market rate developers are current building comparable multifamily projects in Sunnyvale and Mountain View. In Sunnyvale a 124-unit apartment complex has been approved at 395 East Evelyn Avenue, at 41 units to the acre. Another approved project at 321 East Washington Avenue has densities of 48 units to the acre. In Mountain View, a 211-unit residential project at 2400 El Camino Real has 48 units to the acre. Furthermore, the Bay View units have a strong market advantage over these apartment complexes in adjacent cities as the Bay View units offer employees a significantly shorter commute time and access to other amenities (e.g. educational programs and events, fitness center, open space) within the NRP. Please see also the response to Comment 11-6.

H4-22: Please see the responses to Comments 14-27 and 21-31.

H4-23: All of the housing cannot be put in the NRP because it is underlain by a Superfund site that currently poses an unacceptable level of risk for residential development. In addition, there is not enough room in the NRP to accommodate the baseline development, and the proposed education, research and development, and burrowing owl land uses, along with the existing historic district, and to accommodate all of the housing that is required to mitigate the jobs-housing imbalance, traffic, and air quality impacts. NASA has increased the number of housing units within the NRP. There are now 1,930 units, including Buildings 19 and 20 that have been added as dormitory housing in Mitigation Measure SOCIO-1b.

H4-24: Please see the response to Comment 75-2.

H4-25: This is an introductory comment and opinion only. No response is required.

H4-26: NASA has proactively looked for ways to minimize the impact of this project on the community. It is unusual for a research park or new development to build housing on-site at all. However, NASA feels it is appropriate based on their goals. In addition to the provision of 1,120 townhomes and apartments and 810 student apartments and dormitories per Mitigation Measure SOCIO-1b, NASA would also ensure that at least 10 percent of on-site housing is affordable to low income households (see Mitigation Measure SOCIO-1d). This measure would help mitigate NADP's possible housing impact on low income households in the surrounding communities. See also response to Comment 14-27.

H4-27: Please refer to response to Comment 14-27.

H4-28: In response to the comments regarding more locations for housing, NASA has increased the number of units in Parcel 6, in the western portion of the Historic District, and in Bay View. However, other locations for housing on-site are not practical. At this time the runways are still an important component of NASA's mission as well as that of the CANG. The golf course is currently open space and serves as a buffer around the ordnance storage for military tenants.

H4-29: This is an introductory comment and opinion only. No response is required.

H4-30: Only a small portion of the development in the NADP is commercial, most is educational and housing. Please also see the responses to Comments 14-27 and 14-30, and the traffic and housing analyses contained in Chapter 5.

H4-31: This is comment expresses an opinion about housing costs in the Silicon Valley. No response is required. See also response to Comment 14-27.

H4-32: Commuters from the Livermore/Pleasanton and Fremont superdistricts (which contain the Sunol Grade) are in fact included in the NADP Housing Impact Area (HIA). The HIA describes the area where employees at NRP are likely to reside. Table 3.14-9 contains a list of the superdistricts within the HIA. The complete MTC data set for commuters to the Sunnyvale/Mountain View Superdistrict is contained in Table 3.14-8. Superdistricts are included in the HIA if MTC and ABAG project them to generate over 1.0 percent of commuters to the Sunnyvale/Mountain View superdistrict in 2010. See page 3.14-10 for a discussion of how the HIA is defined.

H4-33: This comment expresses an opinion only. No response is required.

H4-34: Only 28 percent of the land in Bay View is being developed. Mitigation Measure BIO-19 in the Mitigated Alternative 5 describes additional "buffer." Please also see the response to Comment 8-2 for a discussion of biological assessments done in Bay View and the adjacent wetlands.

H4-35: Please see the response to Comment 21-31.

H4-36: This comment is a summary of Save The Bay's vision for Moffett Field. Please refer to responses to the Comments in Letter 39.

H4-37: Please see the response to Comment 15-18.

H4-38: The Transportation Demand Management Plan will be a lease requirement for all the NADP Partners and tenants. The TDM and the other mitigations identified in the EIS will be a part of the final Record of Decision and as such will be legally required. NASA has developed a Mitigation Implementation and Monitoring Plan that will address who is responsible for each mitigation and what triggers its implementation.

H4-39: Please see the response to Comment 21-6.

H4-40: This comment expresses an opinion only. No response is required.

H4-41: This comment expresses an opinion only. No response is required.

H4-42: Please see the responses to Comments H2-3 and H2-6.

H4-43: Please see the response to Comment 75-2.

H4-44: Please see the responses to Comments H2-3 and H2-6.

H4-45: The US Army and other military units in the NASA Research Park district have the option of relocating to the Eastside/Airfield district. NASA is planning to relocate the CANG's Consolidated Motor Pool to the Eastside/Airfield.

MS. LOCKYER: Okay. The floor is now open for your comments. I just ask if your name is called if you could go to the microphone. I only have a couple of cards, so if you want to make a comment tonight, I urge you to fill out your card quickly, 'cause we don't have very many cards.

The first speaker will be Zachary Goldberg, followed by Tom Mayer.

ZACHARY GOLDBERG: I'm Zachary Goldberg with the County Planning Office. Unfortunately, just received the EIS a couple days ago, so I only have a few questions.

Who is the decision-maker for NASA? H5-1

MS. OLLIGES: The decision maker will be Harry McDonald, our Director, the Director of Ames Research Center.

ZACHARY GOLDBERG: Okay. What is the process after the EIS has been approved? H5-2

MS. OLLIGES: After the EIS has been approved, then the Record of Decision will be drafted along with the mitigation implementation plan. The mitigation implementation plan describes all the mitigation measures that we are committing to, who will actually perform them, some estimate of the cost, when they would occur, that type of thing. That

spells all of that out.

And then that's signed and adopted along with the -- well, the Record of Decision adopts that or commits to that in addition to choosing which alternative NASA is going to implement. That's the decision that's recorded in the Record of Decision. That's signed by our director.

Following that, there's a 30 day period, waiting period, and after that then the project can proceed.

ZACHARY GOLDBERG: Okay. And about the flexibility, how much flexibility does NASA have with the four alternatives?

MS. OLLIGES: I'm not sure I understand the question.

ZACHARY GOLDBERG: How much flexibility between the total of five, the basic four alternatives is NASA having?

H5-3

MS. OLLIGES: Do you mean which one could we choose if we wanted to?

ZACHARY GOLDBERG: Well, I know that number five is the preferred, but is there any flexibility, and if that doesn't come up, is number four, number three going to be acceptable?

MS. OLLIGES: We have -- we have quite a bit

of flexibility. We can choose number five. We can alter it a little bit as long as we didn't make the impacts greater. We could, you know, add in more mitigations, and we could change things around a little bit here and there in response to comments, if that -- you know, if came up, if that needed to be done.

We could choose one of the other alternatives as well, as they're -- as they're laid out. But currently our intention is alternative five.

ZACHARY GOLDBERG: How long of a time period of mitigation monitoring do you propose? H5-4

MS. OLLIGES: Well, at least the ten years of the construction period. And some of the monitoring will be ongoing even after that, like for the burrowing owls, for example, the transportation demand management, to insure that the average vehicle ridership numbers stay at the goals as set out in the transportation demand management program.

ZACHARY GOLDBERG: Will the NASA Ames research project implement any of NASA's research with zero discharge on the ecological program? H5-5

MS. OLLIGES: I'm sorry, can you repeat the question.

ZACHARY GOLDBERG: Uh-huh. Will the NASA

Ames research project implement any of NASA's research with zero discharge and ecological footprint?

MS. OLLIGES: I'm sorry, could you repeat the question?

ZACHARY GOLDBERG: Uh-huh. Will the NASA Ames project implement any of NASA's past research with zero discharge and also the ecological footprint?

MS. OLLIGES: Will it -- will there be research going on with zero discharge?

H5-5

ZACHARY GOLDBERG: Uh-huh. In terms of -- I know went I to school in Prescott, Arizona when NASA had an MA -- a very large intrinsic program there, and there was a study of zero discharge for the development on our campus and also ecological footprint was a big study there. I'm wondering if any of that will be implemented here.

MS. OLLIGES: Some of it will. Some of the sustainable design principals are going to be built in wherever possible, as I mentioned, will actually end of reducing the demand on the potable water. We'll actually use less when we're built out than we will now. Some things will create emissions, though, like air emissions.

So by using solar wherever possible, we'll reduce those. So some of the -- but it's actually

will there be any research projects to on how to achieve that. I don't know. I mean the exact research projects have not exactly been spelled out, but primarily they would be in the areas of nanotechnology, information technology, biotechnology astrobiology, those programs that are -- that NASA has assigned to Ames Research Center as the mission, the science programs that they want us to carry out. But some of them could include some of those elements.

ZACHARY GOLDBERG: And the last question is what types of ecological design, maybe you can mention some ecological designers you've been working with or are thinking about for the projects? H5-6

MS. OLLIGES: I don't know that we have any specific designers spelled -- picked out at this time. But we mainly just looked at information that's available on the Internet, information that's available in newsletters and that type of thing in terms of (inaudible) to make maximum use of solar so if you have shade during the summer, you have warmth from the sun during the winter, using those types of trees, using California native trees and native plants in landscaping.

Doing the -- we're also looking at the possibility of something like we've talked (inaudible)

on some of the buildings to increase the infiltration on site and decrease the amount of storm water runoff off site. Using the best management practices during storm water -- during construction, to keep the sediment out of the storm water runoff. All of those, those kinds of sustainable design principals.

Using recycled materials and material that are grown locally wherever possible in the construction. Looking at recycling, when the old buildings are torn down, trying to recycle as many of those materials as possibly. Those are the types of sustainable design principals we're looking at.

We haven't actually started designing yet, so we haven't really gotten into details of picking the design firms or -- to that level of detail, but that will come once the -- you know, after the Record of Decision is signed.

ZACHARY GOLDBERG: All right. Thank you very much.

MS. OLLIGES: You're welcome. Thank you for your comments.

MS. LOCKYER: Thank you. The next speaker is Tom Mayer.

TOM MAYER: Hello, my name is Tom Mayer. I live in Sunnyvale, Lakewood Village. I'm here to talk

H5-7

about bicycle and bicycle acts. I just want to touch on owls first.

What have other folks -- what -- people trying to move owl, pairs of owls, how successful has that been in the past in other areas? I know Sunnyvale failed when they tried to move owls at the east end of the Hetch Hetchy when they made the improvements there.

H5-7

And the owls are all gone from Mission College. They tried to move them around there. So has anybody really successfully moved pairs of owls?

MS. OLLIGES: In general it's not very successful if you try to move them during (inaudible) or if you try to move them during the nesting season. And we don't allow any disturbance of any of our owls during the nesting season.

And if a -- what a burrowing owl management plan requires, but we have the four on-site preserves that will be constructed, and what we have done in the past and are currently doing as part of our burrowing owl management, if one or a pair of owl does have to be moved, the project has to wait until they're finished rearing the young, and the young are fledged, and then we build artificial burrows within 50 to 100 feet of where they are, currently are. 'Cause you

can't move them very far. It's unsuccessful.

But we think we have the preserves located, you know, enough throughout the site that what we would do, if we had to move them more than 100 feet or so, is do it in stages. So you move them say 100 feet in one season. And then you wait. Let them, you know, let them nest there, and then the next year you move them another 100 feet until finally get them on the preserve, and then they can stay there. So that's how we would approach it, some way like that. It is -- you're right, it is unsuccessful to try to move them any great distance.

TOM MAYER: All right. And other folks have been successful with this? H5-7

MS. OLLIGES: We have been successful with it. I don't know about others --

TOM MAYER: Okay.

MS. OLLIGES: -- but we at NASA have been successful with moving owls short distances into either -- just either adopt another squirrel -- they live in the squirrel burrows --

TOM MAYER: Right.

MS. OLLIGES: -- so they'll either adopt another squirrel burrow, if those are available, or we have constructed some artificial burrows.

TOM MAYER: Right. I don't know what time of year it was that Sunnyvale tried to move theirs, but it was perhaps 100 feet. And didn't work.

Anyway, bicycles. Moffett, Sunnyvale, Mountain View, with an appropriate supporting infrastructure, is ideal for bike commuting. It's flat with wonderful weather, and Caltrain, which make as nice bike ferry will haul up to 64 bikes per train.

H5-8

Your bike parking, how about using VTA guidelines instead of the, you know, what you have in the EIR? People need -- people that are bike commuters need to have bike lockers, because they have generally expensive bikes, and they have expensive accessories, expensive lighting systems, which if it's just sitting on a rack, pieces tend to disappear.

H5-9

So it needs to be in a locker, needs to be some locker space available. Just use the VTA guidelines. They've worked it out. It's easy.

What about showers? Are you going to have showers for folks when they bike in, in the buildings?

MS. MORRISSEY: Yeah. Actually, that's an aspect that we have now at Ames, and it will continue to be one for any development, changing facilities and shower facilities. We also have looked at the VTA

guidelines for bicycles, but we'll double check again to make sure that we're following them in our guides.

TOM MAYER: Okay. Thank you. Bike access. From the west there needs to be a bike-ped bridge over Stevens Creek close to 101, and the Stevens Creek trail needs to be all weather. Right now it's shut down in the winter. Lots of folks can bike in the winter. Lots of people do bike in the winter. But there needs to be access through there.

With the reconstruction of 101-85, that will also be reconstructing the shoreline overcrossing, and they're going to wind up with double high speed turn lanes, which are killers for bikes. There needs to be other access across 101 for bicycles on that side of Moffett.

H5-10

The -- from the south, you've talked about it in the EIR, it's difficult to get across 101 on, you know, the main entrance, and what were you planning on doing to accommodate bikes on the Ellis Street undercrossing?

MS. MORRISSEY: For the Ellis Street undercrossing, we do have a proposed plan. It's listed in the EIS. We're not sure if it will work or not. We are planning to do some more work on that. Right now we are looking on doing the north side, the

west side of the intersection there under the freeway what they did on the other side for the VTA, which was to build the embankment and allow for an additional lane of traffic to go through on the other side of the support.

TOM MAYER: Okay.

MS. MORRISSEY: So there you could accommodate a bike trail.

TOM MAYER: Now, would you be looking at accommodating a bike trail, or would you just be putting bike lanes on the street?

MS. MORRISSEY: I'm sorry, a bike lane, yes. H5-11

TOM MAYER: Okay. Bike lanes, meaning Caltrans standards?

MS. MORRISSEY: A class two bike line.

TOM MAYER: Yes, okay. And the EIR mentions that there's bike lanes on Moffett Park Drive to the east of the Ellis Street entrance. And that's true, but they don't go anywhere. Well, they go into Sunnyvale where Moffett Park Drive is narrow lanes curb to curb with no space for bikes and walls between the train station and the freeway. H5-12

It's very, very difficult to get through there on a bike safely unless you just take the lane, which most folks are afraid to do, and a lot of cars

don't like bikes taking the lane.

Lockheed has the right to put in a perimeter fence and control access, and after September 11th, I think it's likely that they're going to be doing something where it will no longer be possible to filter through the Lockheed property on a bike to get to Moffett. So something needs to be done to provide access, bicycle access, to Moffett from Sunnyvale on the Moffett Park Drive. Were you -- what plans did you have for mitigation in that area? H5-12

MS. MORRISSEY: We don't have any plans for that, Moffett Park Drive itself. I do know that Sunnyvale has been working on improving their bike access to the Moffett Park area, what they call the Moffett Park area, which is the Lockheed Martin area.

TOM MAYER: Right.

MS. MORRISSEY: And I know there's a new overpass being built at Borregas.

TOM MAYER: That's the Borregas Bridge. Currently it's 2005, not 2002, like the EIR says. But once you get over 237, what do you do on a bike? I mean, that gets you to the Moffett Park area. It doesn't get you to the base. It doesn't get you to the airfield. I mean, the route would be, you know, Moffett Park Drive, which isn't bikeable. H5-13 H5-14

MS. MORRISSEY: Well, there is a bike -- it's not a bike lane. They do have a bike route on Moffett Park Drive right now at Manila Road. There's quite a wide shoulder there for bicyclists.

TOM MAYER: Manila Road on the base, yes, but not --

MS. MORRISSEY: No. Manila Road that parallels the base, between the freeway and the base.

MS. LOCKYER: Mr. Mayer?

TOM MAYER: Yeah.

MS. LOCKYER: Let me read a couple of the cards I have and see if there's any other speakers, and then we'll get back to you, unless you just have a few more questions.

TOM MAYER: I've got just a few more questions.

MS. LOCKYER: Okay.

TOM MAYER: Actually, I'll make the -- rather than having the debate, I'll make the statement.

There is no bicycle access on public property between 101 and the Bay between Moffett Field and what Sunnyvale calls Moffett Park. There is the city street, I think it's called Moffett Park Boulevard, in Sunnyvale, and it's narrow lanes curb to

H5-15

curb. That needs to be fixed to provide bicycle access.

Your EIR talks about bicycle access in that area, but fails to mention that you can't get to the bike lanes approaching Ellis Road on bicycle friendly infrastructure. The -- and the bridge that's mentioned won't help that. That does not improve that situation. H5-15

The EIR talks about bicycle level of service. What is bicycle level of service? Ordinarily, when we think level of service, it's stop and go, bumper to bumper. How many cycles does it take to get through a light. But for bicycles it's gaps in the bicycle friendly streets. Were you planning on fixing the gaps in bicycle friendly streets with the -- because of the increased traffic? Yes, no, maybe? H5-16

MS. MORRISSEY: I'm sorry, I thought you were making a comment, Tom.

TOM MAYER: Okay. Well, what is bicycle LOS? Your EIR refers to bicycle level of service. What does that mean?

MS. MORRISSEY: I'm sorry, I don't know what that means. I can look it up.

TOM MAYER: Okay. Thank you.

MS. LOCKYER: Thank you. And come back if you want after we get through a couple more speakers.

I have a couple cards to read. One says what's going to happen to the golf course? There's a need for golf courses in the area, yet the public is being kept out. H5-17

MS. MORRISSEY: The plan right now is to leave the east side airfield behind a security fence. We have the Air National Guard on that side. They would prefer to keep it secure, and so the golf course will remain behind the fence and will be a secure facility.

MS. LOCKYER: For all the new buildings proposed, where is the funding coming from, NASA, colleges, private companies? H5-18

MS. MORRISSEY: NASA will not be funding the new buildings that are going on in our new development plan except for those that are on the Ames campus itself. Our partners will be bringing the funding with them as part of their programs.

Some of the research monies will be general grants and that kind of thing, but the building funds will come from our partners, the universities, industry, if we have industry partners, and commercial or retail partners will all bring their own funding.

MS. LOCKYER: Our next speaker will be Doug DeLong. And I should mention that's the last speaker card I have. So if anyone wants to make a comment tonight, go ahead and submit your card.

DOUG DELONG: Well, first an unscientific observation, if I could arrive only about ten minutes before tonight's 6:00 o'clock start time and get a parking space very close to the building, we must be making some progress in this process.

One little nit here, I believe there's a typo on the fax sheet. The alternative two build out shows 8.2 million square feet, which I believe the 9.1 got misplaced there. And alternative one shows the 9.1 million square feet build out, and I think you said it's 5.7 is under the baseline case. So this little glossy got a -- seems to have a couple little typos. I think in the formal documentation, I think that's correct, but --

H5-19

MS. OLLIGES: Thanks for pointing that out. We'll take a look at it.

DOUG DELONG: One -- couple little points of information. I understand that this week a request for qualifications from potential bidders was released by the Army Corps of Engineers, that among other things it would encompass the privatization of the

H5-20

Moffett military housing. Realizing that that's not in NASA's sphere of responsibility, I would nevertheless encourage NASA to work with any potential housing proposers that might be able to somehow develop additional units of housing that could meet both the military needs for more aesthetic housing, as well as perhaps provide additional housing for the Ames development plan partners.

H5-20

Also, I understand that the purchase of the cargo salt ponds, the state's got some money committed for that, but the federal money is kind of hung up and wrangling in Washington, and, you know, if we had all those 29,000 acres being on a track to be restored to title wetlands, that would help ease the pain a little bit of having building going on out there in the Bay View parcel.

H5-21

In speaking of the Bay View parcel, I don't know what the real trade-offs are. I noticed in looking at the map that the housing is what's closest to the wetlands and the wild area, if you will. And the recreational areas are back between the housing and the other Ames facilities.

H5-22

I don't know whether it was felt like that was the best choice, or whether putting the recreation out there near the wild would -- maybe you don't want

to have the birds getting hit by the soccer balls, I don't know. But the question of which order to put those just crossed my mind. H5-22

Of course, the main crunch factor in this whole thing is this jobs housing imbalance, which certainly I think we'd all acknowledge is not, you know, of NASA's making. It's really a function of the land use policies of all the local jurisdictions, which in turn has been motivated by generating sources of tax revenue and so on.

Obviously you are doing much more than most commercial developers in this area are doing, and I think you should be saluted for that, and at the same time, you know, 25 percent isn't 100 percent. So just would like to, as much as we can, keep the emphasis on that, and again, if there's some way that you can work with the privatization of the military housing or any other ways that your partners can arrange to help get some additional housing built in connection with this project, that it would be a great benefit to all of us. Thank you. H5-23

MS. LOCKYER: Thank you.

MS. OLLIGES: I'll address one of your questions about the housing and the recreation, why that's sited the way it is, is that area where the

recreation is what's called the clear zone for the 80 by 120 foot wind tunnel, the large wind tunnel, the air intake is like pointed out right where those recreational fields are, so we can have people out there playing ball, but we can't have any buildings in that area because of the quality of air flow coming in. So that's the reason for that.

And the other thing, in terms of Army housing, NASA is following up on that, and if there's any, we are, you know, constantly staying in communication and continuing to work with the Army to try to get some of those units available to us. So that is something we are looking into.

MS. LOCKYER: Unless there's anyone else that would like to make a comment, our last speaker will be Gary Schilling.

GARY SCHILLING: Hello. I would just like a ask a few questions that a previous speaker made some comment about an RFQ or RFPs, just about the process of development once the plan is approved. Will it be led by each entity that's really developing areas of the project? Will it -- will they make their own determination as to the process, or will it be a unified process?

H5-24

MS. MORRISSEY: The development process, we

actually will have different plans for each of the areas. The university reserve area is one of the biggest areas of development, and we will have a master planning partner for that. Right now we've been working with the University of California to do the master planning for that, and they would basically spearhead that portion of the development.

GARY SCHILLING: So probably each entity would even be developing their own schedule for what that process actually is? H5-24

MS. MORRISSEY: Obviously NASA would still remain essentially the overall planner and would coordinate all different schedules for the project.

MS. OLLIGES: And on the scheduling, too, we'll be monitoring that to make sure we keep the level of construction such that the generation of Nox is less than 100 tons per year. So NASA will be acting in that capacity to coordinate that development, and people have to take turns and only do so much per year.

GARY SCHILLING: Still trying to work within a ten year period? H5-24

MS. OLLIGES: Correct.

GARY SCHILLING: All right. Thank you.

MS. LOCKYER: Thank you. And thank you all

HEARING 5
Sunnyvale City Council Chambers, Thursday, December 13, 2001.

H5-1: The decision makers for the proposed project are the Director, NASA Ames Research Center and the Associate Administrator for Aerospace Technology, NASA Headquarters, Washington, D.C.

H5-2: Thirty days after the EIS is approved, a Record of Decision (ROD) would be drafted along with a Mitigation Implementation Monitoring Plan. This plan describes the mitigation measures that NASA would commit to, who would carry out the measures, an estimate of the cost to carry out each measure, when the monitoring would occur, the party responsible for monitoring each measure, the monitoring method and frequency. The ROD, which would be signed by the Associate Administrator for Aeronautics at NASA Headquarters, would commit NASA to the mitigation monitoring plan and to the alternative NASA would implement. After signing the ROD, the project could proceed.

H5-3: NASA has the flexibility in choosing which alternative it could implement. However, at the time of writing, NASA plans to choose Mitigated Alternative 5. NASA could add additional mitigations to Alternative 5 to reduce the impacts to less than what was described in the EIS.

H5-4: NASA would monitor the proposed mitigation measures at least during the eleven-year construction period. Some monitoring would continue beyond the construction period, including burrowing owl monitoring and transportation demand management, to ensure that goals are met.

H5-5: Some of the sustainable design principles would be built in wherever possible. Due to the use of such design features as low-flow fixtures and the use of reclaimed water in landscaping, NASA would use only

slightly more potable water when the NADP is built out than they do now. Some aspects of the project, however, would create emissions (e.g. air emissions). By using solar wherever possible, however, those emissions would be reduced. Whether or not there would be any additional research projects on how to achieve zero discharge remains to be determined. Within the NASA Research Park itself, the primary focus for research would be in the areas of nanotechnology, information technology, biotechnology and astrobiology. These are the programs that have been designated as NASA Ames Research Center's missions.

H5-6: No specific designers have been identified at this time. However, a Design Guide has been developed to establish some general expectations and parameters for the activity within the development areas. Design would be carried out in accordance with LEED Certification requirements. See response to Comment 14-30, which addresses sustainability.

H5-7: Please see the responses to Comment 21-38.

H5-8: Please see the response to Comment 13-1.

H5-9: Please see response to Comment 15-55.

H5-10: The reconstruction of Moffett Boulevard includes the provision of bicycle lanes and replacement of the existing, uncontrolled loop ramps at the Highway 101 interchange (that are dangerous for bicyclists) with signalized ramp intersections. More controlled traffic will improve the environment for bicyclists and provide better access to the west side of the project site. In addition, the existing pedestrian/bicycle bridge across Stevens Creek near the eastern terminus of Charleston Avenue will be maintained. A plan has been developed to provide bicycle lanes through the Ellis Street

interchange, but the feasibility of this plan is still being evaluated. Please see also the responses to Comments 37-4 and H1-32.

H5-11: The TDM Program specifies Class II bike lanes along all NRP streets. The VTA's *Bicycle Technical Guidelines: A Guide for Local Agencies in Santa Clara County*, was used to develop the bicycle accommodation standards within the NRP.

H5-12: Please see the response to Comment 37-4.

H5-13: The DPEIS notes the planned construction of the Borregas Bridge on page 3.3-40, but does not specify a date of completion.

H5-14: Please see the response to Comment 37-4.

H5-15: Bicycle lanes on Middlefield Road provide access to Moffett Boulevard and Ellis Street on the west side of Highway 101. The new on-site bicycle facilities would also provide links to these streets from project uses. Bicycle travel to the south and east along Manila Drive and Moffett Park Drive is less attractive because of relatively narrow shoulders and/or travel lanes and traffic congestion at the Mathilda Avenue/Highway 237 interchange. Traffic interchange congestions are discussed in Section 3.3, subsection C.3.

H5-16: The EIS does not refer to level of service (LOS) for bicycles. However, the Draft TDM program refers to LOS for bicycles on page 25. There is no "industry standard" to measure bicycle level of service. The concept of bicycling LOS is to provide a measurement of the type of bicycle amenities available along a corridor or the bicycle conditions along a corridor. LOS analysis for bicycling is becoming a more widely accepted concept to define where and what types of bicycle improvements and needed. Some formulas have been developed to define the level of "bicycle comfort" on a given street, such as the Bicycle Compatibility Index and the Bicycle Level of

Service Model. Some jurisdictions have developed their own qualitative assessments -- essentially check-lists showing the bicycle conditions along a roadway segment. The NRP TDM Plan uses the term bicycle-level-of-service with the expectation that the TMA would develop, or adopt, a standard for measuring bicycling conditions within the NRP so that improvements can be made to ensure a comprehensive bicycle network.

The discussion of bicycle facilities in the DPEIS does refer to the environment for bicyclists and whether certain situations are conducive or detrimental to bicycle travel. The proposed project includes extensive facilities and services to encourage bicycle travel and would accommodate the planned Bay Trail alignment. Gaps in existing bicycle facilities in adjacent cities are the responsibility of those jurisdictions.

H5-17: NASA plans on keeping the Eastside/Airfield area behind a security fence. The California Air National Guard currently resides within this area, and would prefer to keep it secure. Therefore, the golf course would remain behind the fence and would be a secure facility.

H5-18: The funding for the construction of the NRP would be coming with NASA's partners. They may raise money through grants or bonds, especially the university partners, or through the use of appropriated funds. Industry or commercial partners would bring their own funding and financing.

H5-19: This a comment on the Fact Sheet that accompanied the DPEIS. The commentor is correct in stating that a buildout of 845,400 square meters (9.1 million square feet) would be for Alternative 2, not Alternative 1.

H5-20: Please see the responses to Comments 14-27 and 75-2.

H5-21: This is a comment on the Cargill Salt Ponds, which are outside of the scope of the DPEIS. No response is required.

H5-22: The open space buffer between development and the wetlands in the Bay View area (see Mitigation Measure BIO-19) has been increased to 61 meters (200 feet). The buffer area would be increased by distributing the open space in Parcel 10 in a new configuration, while leaving Parcel 10's land area the same, and by relocating Parcel 4 to the east of proposed housing in Bay View.

H5-23: NASA is currently holding discussions with the US Army Corps of Engineers to secure additional housing units from Moffett Field housing presently under the administration of the Army. NASA will continue to seek housing opportunities with the US Department of the Army and has incorporated this idea into Mitigation Measure SOCIO-1a in the Final Programmatic EIS. To the extent NASA can obtain additional housing at Moffett Field, NASA can further mitigate its significant but unavoidable negative impacts on regional housing demand. NASA has proposed more on-site development of housing. Please also see response to Comment 14-27.

H5-24: Once the Record of Decision is signed, NASA will begin the process of coming to agreements with its partners on the next step of planning and design. NASA would remain the overall scheduler and planner and would manage the allocation of square feet of construction to be built in each year to ensure that the generation of NOx remains under 91 tonnes (100 tons) per year. Each partner or group of partners would manage their own master planning within their parcels. NASA expects to have a master planner for all the universities, which would most likely be the University of California.