REPORT

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Please
Original to:
NASA - Wallops Flight Fac
Mailcode 205.W
Bldg N-161 Rm. 105
Wallops Island VA 23337

Submitted to:
National Aeronautics
and Space Administration
Goddard Space Flight Center
Wallops Flight Facility
Wallops Island, Virginia

Final Report

Revision of Site Investigation
Wallops Flight Facility
Wallops Island, Virginia

Volume I

August 1992

Environmental A/E Services
Contract NAS5-35042

Metcalf & Eddy
Metcalf & Eddy, Inc.
14502 Greenview Drive
Suite 500
Laurel, MD 20708

Metcalf & Eddy
An Air & Water Technologies Company

J-8473

August 27, 1992

National Aeronautics and Space Administration
Goddard Space Flight Center
Building D-1, Code 273.1
Wallops Flight Facility
Wallops Island, VA 23337

Attn: Mr. Roy Conk

Subject: Contract NAS5-35042, Environmental A/E Services, Delivery Order 7 Final Submittal

Dear Mr. Conk:

Metcalf & Eddy, Inc. (M&E) is pleased to submit four copies of the Final Revision of Site Investigation Report for Wallops Flight Facility - Volumes I through IV.

The enclosed document includes both the analytical results submitted by Spectralytix following the May 1992 sampling effort, and the results submitted by GP Environmental Services as a result of the resampling effort in August. This final submittal includes verified laboratory data.

Comments received on the draft submittal have been incorporated and the responses to those comments are summarized in Attachment 1 to this letter.

Please contact me or Ms. Karen Thorpe, Project Engineer, at (301) 317-9600 should you have any questions or comments regarding this draft submittal.

Sincerely,

Margaret G. Farrell
Project Manager
Metcalf & Eddy, Inc.

Enclosures

14502 Greenview Drive, Suite 500, Laurel, MD 20708
301-317-9600 FAX 301-317-9431

Attachment 1

Summary of Responses to Comments
Draft Submittal of Revision of Site Investigation Report

Comment: Section 2I, Page 2-6

Response: The referenced sentence was deleted.

Comment: Section 2I, Page 2-7

Response: The estimated volume of contaminated soil removed from the AFTF was incorporated into the report (4700 tons) and the phrase "undetermined quantity" was deleted.

Comment: Section 2I, Page 2-12

Response: A brief discussion of the localized mercury contamination was added to this section. In addition, a statement that the mercury contamination can be addressed as part of the PCB cleanup action was added to the end of the Scrapyard discussion.

Comment: Section 3D, Page 3-21

Response: This comment was discussed with Terry Spagnuolo. Since the latitude and longitude of the wells is included in Table 3D-1 and a map of the well locations is included in Appendix A, no further action was necessary.

Comment: Section 4D4, Page 4-4

Response: a. This section addresses only surface water intakes associated with major recreation areas. The Draft EIS for the Chincoteaque National Wildlife Refuge Master Plan was reviewed and information regarding intake of surface water from Toms Cove was incorporated into this section. That document was cited as a reference.

b. The previous reference 24 was deleted. The above document was cited for this section.

Comment: Section 4E2, Page 4-5

Response: a. The draft notices regarding the proposed designation of the northern and southern portion of Wallops Island were reviewed, the data was incorporated into the section, and one of the draft notices was cited as a reference.

b. The discussion was edited to indicate that the Atlantic coast population of the piping plover is a Federal Threatened (as opposed to Endangered) species.

c. Assawoman Island was added to the discussion of the proposed designation for piping plover habitat.

d. Wilson's plover was changed to State Endangered from Federal Endangered.

e. Pelican Island was added to the discussion regarding the designation of critical habitat for the piping plover. The island is also utilized by the Wilson's plover and gull-billed terns. This information was incorporated. The information was obtained via personal contact with Karen Terwilliger of the Virginia Department of Game and Inland Fisheries. She has been cited as a reference.

Comment: Section 4E2, Page 4-6

Response: a. Piping plover status was changed from Federal Endangered to Federal Threatened.

b. An "e" was inserted between the "c" and the "p" in the species name for the bald eagle.

Comments
Revision of Site Investigation

Section	Page	Comments
2I	2-6	No reason to restate that contaminated soil was transported to local landfill. Sentence is stated in previous paragraph.
2I	2-7	Estimated for soil removed during tank farm removal is approximately 4700 tons.
2I	2-12	The Final Summary Report states there is localized mercury contamination at the Scrapyard, but there is no discussion in this document.
3D	3-21	Should we include a description on whether the wells are located upgradient or downgradient of the sites?
4D4	4-4	a. Statement in this section is inconsistent with statement in section 4E2, p. 4-5, para. 1. Assateague Island National Seashore (AINS) occupies the Toms Cove Hook area of Assateague Island; Toms Cove Hook includes Fishing Point. The entire AINS section is considered a recreation area by both the U.S. Fish and Wildlife Service and the National Park Service. If Fishing Point is considered to be within the target area for section 4E2, then it should be considered in this section also. Recommend that you refer to the Draft Environmental Impact Statement (EIS) for the Chincoteague National Wildlife Refuge Master Plan for complete details of the relationship between the seashore and the refuge. Pam Whitman has a copy of this document. b. Reference 24 is not credible. Chincoteague National Wildlife Refuge (CNWR) does not have a Public Affairs Officer. Sally Oshaben is, in fact, the head fee collector at the refuge and in no position to make such statements. The Refuge Master Plan EIS would more credible.

Section	Page	Comments
4E2	4-5	a. Both the northern and southern portions of Wallops Island have been <u>proposed</u> as critical habitat for piping plovers. Actual designation is pending signature by the director of the U.S. Fish and Wildlife Service. Refer to information provided to Erin Hogan for the Environmental Resources Document for correct citation. b. The Atlantic Coast population of piping plovers is a Federally-listed <u>Threatened</u> species, not endangered as listed (only the Great Lakes population is endangered). c. Need to include Assawoman Island in this discussion. It is a part of the CNWR and since the inlet closed actually an extension of Wallops Island. Assawoman Island and the Southern Tip of Assateague are also in the proposed designation for piping plover critical habitat. d. Wilson's plovers are <u>State Endangered</u>, not federally endangered species. e. Why was Pelican Island (the little Island off the northern end of Wallops Island) not mentioned in this section? The USFWS refers to this as "New Island, VA" in the draft Federal Register Notice for Piping Plover Critical Habitat. If you don't have these pages out of the draft notice, we can provide them. This island also is a nesting area for several species of terns. The Virginia Department of Game and Inland Fisheries surveys this island on a fairly regular basis and can provide this information.
4E2	4-6	a. Change piping plover status from "Federal Endangered" to "Federal Endangered". b. insert an "e" between the "c" and "p" in the species name for the bald eagle.

Submitted to:
National Aeronautics
and Space Administration
Goddard Space Flight Center
Wallops Flight Facility
Wallops Island, Virginia

Final Report

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Wallops Flight Facility
Wallops Island, Virginia

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Environmental A/E Services
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APPENDICES

APPENDIX A - MAP POCKETS

APPENDIX B - E_i CALCULATIONS

APPENDIX C - ANALYTICAL DATA

VOLUME II - REFERENCES

Submission of references utilized in the preparation of the Revision of Site Investigation Report. Prepared by Metcalf & Eddy, Inc. August 1992.

VOLUME III - REFERENCES

Submission of references cited in the Preliminary Assessment Report for Wallops Flight Facility. Prepared by Ebasco Services, Inc. April 1988.

VOLUME IV - REFERENCES

Submission of references cited in the Final Site Investigation Report for Wallops Flight Facility. Prepared by Ebasco Services, Inc. January 1990.

INTRODUCTION

Background

The National Aeronautics and Space Administration (NASA), Goddard Space Flight Center (GSFC), Wallops Flight Facility (WFF) was placed on the Federal Agency Hazardous Waste Compliance Docket in February 1988, under Federal Facility Identification Number VA8800010763.

As a result of being placed on the docket, WFF was required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to submit to the U.S. Environmental Protection Agency (EPA) the information necessary to complete a Hazard Ranking System (HRS) score for the facility. The HRS scoring evaluates the relative risk to human health or the environment due to potential or actual releases of uncontrolled hazardous substances. The HRS is the principal methodology used by the EPA to place sites on the National Priorities List (NPL). The NPL identifies sites which warrant further investigation to determine the risks posed to public health or the environment.

In compliance with CERCLA, WFF submitted to the EPA and the Commonwealth of Virginia a Preliminary Assessment (PA) Report in 1988, and a Site Inspection (SI) Report in 1989. The PA Report identified six areas of concern at the WFF Main Base. Those areas were:

- Fire Training Area
- Waste Oil Dump
- Aviation Fuel Tank Farm (AFTF)
- Scrapyard
- PCB Transformer (Building N-161C)
- Photographic Tank (Building M-15)

From that list, four source areas were identified in the 1989 SI Report as potential candidates for inclusion on the NPL. The four source areas are:

- Fire Training Area
- Waste Oil Dump
- AFTF
- Scrapyard

The Photographic Tank at Building M-15 was removed from the previous list of potential sources based on additional investigations conducted by NASA which indicated the contents were not hazardous and the surrounding soils were not contaminated. The results of that investigation are detailed in the Final Summary Report (Reference 1).

The PCB transformer at Building N-161C was replaced with a non-PCB transformer following preparation of the 1988 PA Report. Upon review of the PA Report, EPA requested additional information regarding the PCB Transformer site. An investigation conducted in 1990 indicated that, although the concrete transformer pad was not contaminated, soil contamination existed, and an estimated areal extent of PCB soil contamination was defined. That investigation, also detailed in the 1990 Final Summary Report, indicated removal of a minimum of 140 cubic yards of contaminated soil would be required as part of a Toxic Substance Control Act (TSCA) cleanup. Since PCB contamination was also detected at the Scrapyard site, and the volume of contaminated soil at the Transformer site is relatively small, a single cleanup program will be used by NASA to address both areas. Therefore, the PCB Transformer site has been included with the Scrapyard as a single source area (Reference 1).

Under the Superfund Amendments Reauthorization Act (SARA), the EPA was required to amend the HRS to more accurately and consistently evaluate the relative risk posed by the sites under review. EPA published the final rule for the HRS in the Federal Register (55 FR 241) on December 14, 1990 (Reference 2). As a result of the revisions to the HRS and the review of the PA/SI Reports, EPA has requested additional data to complete the evaluation of the WFF sites for inclusion on the NPL. EPA provided NASA with a deficiency checklist indicating areas requiring additional information.

Report Format

This Revision of Site Investigation Report is comprised of four volumes. Volume I follows the format of the EPA deficiency checklist to ensure each deficiency has been addressed. The EPA checklist is provided for reference following this introductory section. Volume II contains copies of the references cited in Volume I. Volumes III and IV contain copies of the available references cited in the previously submitted PA and SI Reports, as required by Item 1A of the EPA checklist.

Sections of the Revision of Site Investigation Report, Volume I will address deficiencies in the data previously supplied to EPA as follows:

Section 1: Overview/Site History
Section 2: Waste/Source Information
Section 3: Groundwater Pathway Information
Section 4: Surface Water Pathway Information
Section 5: Air Pathway Information
Section 6: Soil Exposure Pathway Information

For ease of reference to the EPA checklist, each section of this report includes in bold print the EPA checklist number and information required. Each response follows in standard print.

No additional field investigations or sampling efforts were completed in developing this report,with the exceptions of additional surface water and sediment sampling required as part of Section 4 of the deficiency checklist; soil sampling performed to further quantify the contaminant volume of the source areas; and a site visit. All data, with the exception of the results of the additional sampling described above and field observations regarding drainage patterns, was collected from Federal, State, and local agencies, previously completed NASA reports, and personal communication with NASA personnel. A list of references utilized in preparation of this report is included as Section 7.

HRS SCORING DEFICIENCY CHECKLIST

Rec #: 129

EPA ID # VA8800010763
Federal Facility ID # VA8800010763
Facility Name NASA WALLOPS FLIGHT CENTER

City WALLOPS ISLAND State VA Zip 23337

		INFORMATION IS PROVIDED? Y/N	ACCEPTABLE? Y/N*
1.	**OVERVIEW/SITE HISTORY**		
1A.	Reports submitted to EPA are referenced and copies of each reference are provided.	N	
1B.	Describe facility operations (manufacturing, storage, waste disposal practices, etc.) including the following:	N	
1B1.	History of the facility and sources (any area containing or potentially containing hazardous substances).	Y	Y
1B2.	A topographic map with a 4-mile radius drawn around each source.	N	
1B3.	A facility and source location map and sketch.	Y	Y
1B4.	Regulatory history of the facility (e.g., RCRA facility, TSCA, CERCLA, NPDES permits, etc.).	Y	Y
1C.	Describe any emergency response actions or interim remedial actions that have occurred at the facility. Description should include amount of materials removed, disposal location, and sample analytical results prior and subsequent to removal.	Y	Y
1D.	Describe any release of hazardous substances, pollutants, or contaminants to ground water, surface water, soil, or air and provide sampling results with detection limits, laboratory methods, and quality assurance procedures.	Y	Y
1E.	Give the following population within each radius indicated below. Each radius should begin at the center of each source if the source is small or at the outer edge if the source is large. Count population in overlapping areas only once.	N	
1E1.	0 - 1/4 mile		
1E2.	1/4 - 1/2 mile		
1E3.	1/2 - 1 mile		
1E4.	1 - 2 mile		
1E5.	2 - 3 mile		
1E6.	3 - 4 mile		

* Where information is provided but not acceptable, see attachment for a detailed explanation of why the information is not acceptable.

HRS SCORING DEFICIENCY CHECKLIST

Facility Name NASA WALLOPS FLIGHT CENTER

		INFORMATION IS PROVIDED? Y/N	ACCEPTABLE Y/N*
1F.	Describe any prior spills (e.g., quantity of the spill, hazardous substances) that occurred at the facility.	Y	Y
1G.	Describe facility and source security and access (e.g., fences, patrols, gates, etc.).	N	—
2.	**WASTE/SOURCE INFORMATION (see Section 2 of the HRS Final Rule - December 1990 Federal Register)**		
2A.	Describe as specifically as possible the types of wastes produced at the facility and the methods in which these wastes were treated, stored, or disposed.	Y	Y
2B.	Describe as specifically as possible the amount (volume, weight, etc.) of each waste type produced and the form in which it was discharged or disposed (e.g., solid, liquid) at the facility.	Y	Y
2C.	Describe each source type (e.g., landfill) located within the facility boundary.	Y	Y
2D.	Describe as specifically as possible the constituents (concentrations of individual constituents) of each waste type disposed in each source.	Y	Y
2E.	Describe as specifically as possible the amount of waste treated, stored, or disposed of in each source (e.g., landfills, impoundments, tanks).	Y	Y
2F.	Determine the depth at which wastes were deposited in each source.	Y	Y
2G.	Describe as specifically as possible the condition/integrity of each source (e.g., Do landfills have liners or caps?).	Y	Y
2H.	Describe any secondary containment features/structures associated with each source (e.g., precipitation runon and runoff systems, leachate collection systems, gas collection systems).	N	—
2I.	Describe the size, volume, capacity, and area of each source.	N	—
3.	**GROUND-WATER PATHWAY INFORMATION (see Section 3 of the HRS Final Rule - December 1990 Federal Register)**		
3A.	Determine if the ground water within a 4-mile radius of each source is used for any of the following purposes and locate the wells on a map. Each radius should begin at the center of each source if the source is small or at the outer edge if it is large. Provide the depth of each well.	Y	N

* Where information is provided but not acceptable, see attachment for a detailed explanation of why the information is not acceptable.

HRS SCORING DEFICIENCY CHECKLIST

Facility Name NASA WALLOPS FLIGHT CENTER

		INFORMATION IS PROVIDED? Y/N	ACCEPTABLE? Y/N*
3A1.	private or public drinking-water source	—	—
3A2.	irrigation of commercial food or commercial forage crops (include acres)	—	—
3A3.	commercial livestock watering	—	—
3A4.	commercial aquaculture	—	—
3A5.	water for major or designated recreational area, excluding drinking-water use	—	—
3A6.	standby wells used for drinking water at least once a year	—	—
3B.	Outline the public water distribution system within a 4-mile radius of each source on a topographic map.	N	—
3C.	Identify the nearest drinking-water well within a 4-mile radius of each source.	Y	N
3D.	Determine the population (including workers, students, and residents) drawing from each drinking-water well within the following radii. Each radius should start at the center of each source if the source is small, or at the outer edge if it is large. Count population in overlapping areas only once.	N	—
3D1.	0 - 1/4 mile	—	—
3D2.	1/4 - 1/2 mile	—	—
3D3.	1/2 - 1 mile	—	—
3D4.	1 - 2 mile	—	—
3D5.	2 - 3 mile	—	—
3D6.	3 - 4 mile	—	—
3E.	Describe known or probable ground-water flow direction from each source.	Y	Y
3F.	Describe as specifically as possible the geology and hydrogeology of the facility area (including geological formation name, thickness, types of material, hydraulic conductivities, and depth to aquifers); provide references.	Y	Y
3G.	Discuss any evidence of aquitards and discontinuities between aquifers within a 4-mile radius of each source.	Y	Y
3H.	Describe any evidence of interconnections between the uppermost aquifer and lower aquifers within 2 miles of each source.	Y	Y
3I.	Estimate annual net precipitation at the facility.	N	—
3J.	Discuss soil or geologic conditions that might inhibit or facilitate ground-water migration.	Y	Y

* Where information is provided but not acceptable, see attachment for a detailed explanation of why the information is not acceptable.

HRS SCORING DEFICIENCY CHECKLIST

Facility Name NASA WALLOPS FLIGHT CENTER

		INFORMATION IS PROVIDED? Y/N	ACCEPTABLE? Y/N
3K.	Determine if sources are located in an area of Karst terrain.	Y	Y
3L.	Provide results from ground-water sampling of aquifers underlying the sources and from domestic wells (drinking water) within 2 miles of each source.	Y	Y
3M.	Provide results from background ground-water sampling of aquifers underlying the sources.	Y	Y
3N.	Determine if any areas within a 4-mile radius of each source are located in a Wellhead Protection Area according to Section 1428 of the Safe Drinking Water Act.	Y	Y
4.	**SURFACE-WATER PATHWAY INFORMATION (see Section 4 of the HRS Final Rule - December 1990 Federal Register)**		
4A.	Describe surface-water bodies 0 to 15 miles downstream of each source and provide a map of surface-water bodies receiving drainage from each source.	Y	N
4B.	Discuss the probable surface runoff pattern from each source to surface waters, including the distance to the nearest surface-water body; provide a map.	N	—
4C.	Describe the point(s) at each source where hazardous substances begin to migrate and their probable point(s) of entry into a surface-water body (including ponds, lakes, streams, etc.).	N	—
4D.	Identify if surface water drawn from intakes within 15 miles downstream of the probable point of entry is used for any of the following purposes:	N	—
4D1.	irrigation (5-acre minimum) of commercial food or commercial forage crops	—	—
4D2.	watering of commercial livestock	—	—
4D3.	ingredient in commercial food preparation	—	—
4D4.	major or designated water recreation area, excluding drinking water	—	—
4E.	Identify the following targets associated with surface-water bodies 0 to 15 miles downstream of the probable point of entry:	N	—
4E1.	population (residents, workers, and students) served by intakes of drinking water	—	—

* Where information is provided but not acceptable, see attachment for a detailed explanation of why the information is not acceptable.

HRS SCORING DEFICIENCY CHECKLIST

Facility Name NASA WALLOPS FLIGHT CENTER

		INFORMATION IS PROVIDED? Y/N	ACCEPTABLE? Y/N*
4E2.	sensitive environments (see Table 4-23, December 1990 Federal Register) and critical habitats for federally endangered or threatened species	—	—
4E3.	economically important resources (e.g., shellfish)	—	—
4E4.	any portion of the surface water designated by a state for drinking-water use under Section 305(a) of the Clean Water Act; or any portion of surface water usable for drinking water	—	—
4F.	Determine the miles of wetlands (wetland frontage) along surface-water bodies 0 to 15 miles downstream from the probable point of entry (see 40 CFR section 230.3).	N	—
4G.	Provide results from sampling of wetlands and/or sensitive environments 0 to 15 miles downstream of each source.	N	—
4H.	Discuss any qualitative, quantitative, or circumstantial evidence of contamination of surface waters from sources.	N	—
4I.	Provide results from sediment and surface-water sampling for points 0 to 15 miles downstream of each source.	N	—
4J.	Provide results from background sediment and surface-water sampling.	N	—
4K.	Provide results from sampling of surface-water intakes 0 to 15 miles downstream of each source.	N	—
4L.	Estimate the size of the upgradient drainage area for each source.	N	—
4M.	Determine the 2-year, 24-hour rainfall for the site.	N	—
4N.	Discuss the average annual streamflow associated with each surface-water body located 0 to 15 miles downstream of each source.	N	—
4O.	Determine surface soil types at the facility.	Y	Y
4P.	Determine if sources are located in a 1-year, 10-year, 100-year, or 500-year flood plain.	Y	Y
4Q.	Discuss fisheries (recreational or commercial) in surface-water bodies 0 to 15 miles downstream of each source:	N	—
4Q1.	Describe annual production (in pounds) of human food chain organisms (e.g., trout, shellfish, snapping turtles, crabs) per acre of streams and rivers 0 to 15 miles downstream of each source.	—	—

* Where information is provided but not acceptable, see attachment for a detailed explanation of why the information is not acceptable.

HRS SCORING DEFICIENCY CHECKLIST

Facility Name NASA WALLOPS FLIGHT CENTER

		INFORMATION IS PROVIDED? Y/N	ACCEPTABLE*? Y/N
4Q2.	Describe annual production (in pounds) of human food chain organisms (e.g., trout, shellfish, snapping turtles, crabs) per acre of ponds, lakes, bays, or oceans 0 to 15 miles downstream of each source.	—	—
4R.	Identify closed fisheries 0 to 15 miles downstream of each source.	N	—
4S.	Provide results from sampling of human food chain organism tissues in streams and rivers 0 to 15 miles downstream of each source and in ponds, lakes, and bays that receive drainage from the sources.	N	—
5.	**AIR PATHWAY INFORMATION (see Section 6 of the HRS Final Rule - December 1990 Federal Register)**		
5A.	Describe if there has been an observed release (i.e., visual or analytical evidence) of a hazardous substance to the atmosphere.	Y	Y
5B.	Determine the shortest distance to the closest residence or regularly occupied building or area from any on-site source.	N	—
5C.	Determine if any of the following resources are located within a 1/2-mile radius of each source	N	—
5C1.	commercial agriculture	—	—
5C2.	commercial silviculture	—	—
5C3.	major or designated recreation area	—	—
5D.	Determine if sensitive environments are within a 4-mile radius of each source.	N	—
5E.	Determine the total area of wetlands within a 4-mile radius of each source.	N	—
6.	**SOIL-EXPOSURE PATHWAY INFORMATION (see Section 5 of the HRS Final Rule - December 1990 Federal Register)**		
6A.	Describe any areas of contamination that are within 2 feet of the ground surface; provide the areal extent of contamination.	Y	Y
6B.	Provide locations and depths of soil samples and results.	Y	Y
6C.	Provide results of background soil sampling.	Y	Y

* Where information is provided but not acceptable, see attachment for a detailed explanation of why the information is not acceptable.

HRS SCORING DEFICIENCY CHECKLIST

Facility Name NASA WALLOPS FLIGHT CENTER

		INFORMATION PROVIDED? Y/N	ACCEPTABLE? Y/N*
6D.	Describe the measures taken to limit access to areas with soil contamination within 2 feet of the surface (e.g., fences, security guards).	N	—
6E.	Determine if any of the following are located near or within an area of soil contamination (within 2 feet of the surface); provide the number of individuals for 6E1 and 6E2:	N	—
6E1.	within 200 feet of any residences, schools, or day care centers and within the property boundary	—	—
6E2.	within 200 feet of the work place area and within a work place property boundary	—	—
6E3.	within boundaries of commercial agriculture, silviculture, livestock production, or grazing area	—	—
6E4.	within boundaries of a terrestrial-sensitive environment (see Table 5-5, December 1990 Federal Register)	—	—
6F.	Determine the number of individuals who live, work, or attend school within the following distances of soil contamination (within 2 feet of the surface).	N	—
6F1.	0 - 1/4 mile radius	—	—
6F2.	1/4 - 1/2 mile radius	—	—
6F3.	1/2 - 1 mile radius	—	—

* Where information is provided but not acceptable, see attachment for a detailed explanation of why the information is not acceptable.

HRS Scoring Deficiency Checklist Attachment

Wallops Flight Center (Wallops Island, VA)

The sources of information EPA reviewed to complete the attached deficiency checklist are provided in the cover letter.

In cases where information was provided to EPA but is not acceptable, EPA has provided an explanation below. The number and the letter adjacent to the explanation corresponds to the number and the letter that appears on the HRS Scoring Deficiency Checklist.

3A. - Provide a map locating all the wells within a 4-mile radius of each source. Provide information on the depth of each well and its use.

3C. - Identify the nearest drinking-water well within a 4-mile radius of each source.

4A. - Provide a map of surface-water bodies receiving drainage from each source.

SECTION ONE: OVERVIEW/SITE HISTORY

1A. Reports submitted to EPA are referenced and copies of each reference are provided.

The previously submitted Preliminary Assessment and Site Inspection (PA/SI) Reports are referenced. A listing of these references, a copy of each available reference, and a list of reports previously submitted to EPA are included in Volumes III and IV of this report. Additional references utilized in the preparation of this Revision of Site Investigation Report are included in Volume II.

1B. Describe facility operations (manufacturing, storage, waste disposal practices, etc.) including the following:

1B1. History of the facility and sources (any area containing or potentially containing hazardous substances).

The EPA has indicated on the deficiency checklist that this information, provided in the PA/SI Reports, is acceptable. No further discussion is required.

1B2. A topographic map with a 4-mile radius drawn around each source.

For clarity and to reduce confusion due to overlap of the radii, a United States Geological Survey (USGS) topographic map with a 4-mile radius is provided for each source area. The maps, labeled as indicated below, are included in Appendix A.

Figure 1B2-1. Fire Training Area: 4-Mile Radius
Figure 1B2-2. Waste Oil Dump: 4-Mile Radius
Figure 1B2-3. Aviation Fuel Tank Farm: 4-Mile Radius
Figure 1B2-4. Scrapyard/PCB Transformer: 4-Mile Radius

1B3. A facility and source location map and sketch.

The EPA has indicated on the deficiency checklist that this information, provided in the PA/SI Reports, is acceptable. No further discussion is required; however, for ease of review, adapted copies of previously submitted facility and source location maps are included in this report as Figures 1B3-1 through 1B3-6 (References 1 and 3).

1B4. Regulatory history of the facility (e.g., RCRA facility, TSCA, CERCLA, NPDES permits, etc.).

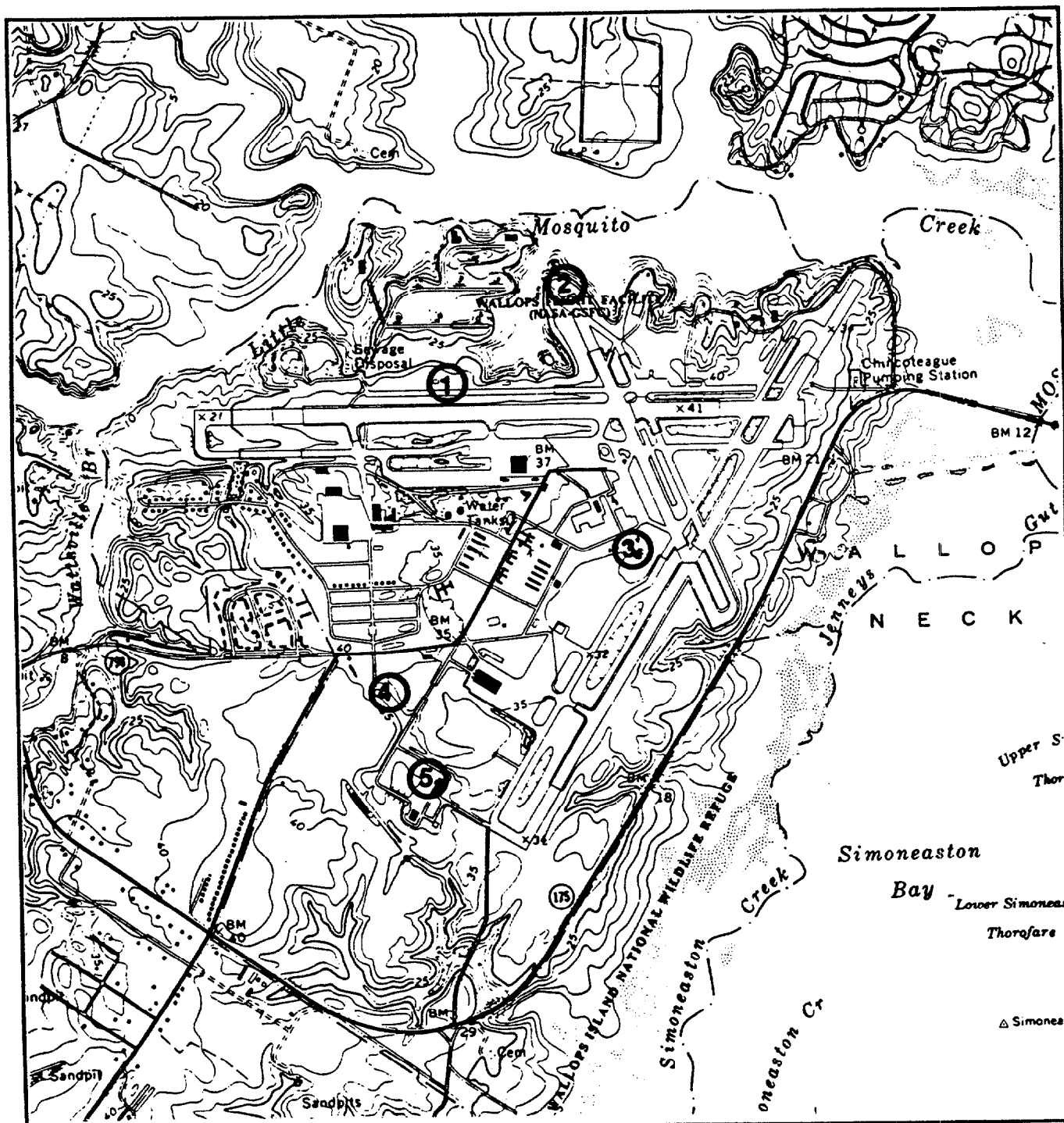
The EPA has indicated on the deficiency checklist that this information, provided in the PA/SI Reports, is acceptable. No further discussion is required.

1C. Describe any emergency response actions or interim remedial actions that have occurred at the facility. Description should include amount of materials removed, disposal location, and sample analytical results prior and subsequent to removal.

The EPA has indicated on the deficiency checklist that this information, provided in the PA/SI Reports, is acceptable. No further discussion is required.

1D. Describe any release of hazardous substances, pollutants, or contaminants to groundwater, surface water, soil, or air and provide sampling results with detection limits, laboratory methods, and quality assurance procedures.

The EPA has indicated on the deficiency checklist that this information, provided in the PA/SI Reports, is acceptable. No further discussion is required.



SOURCE AREAS

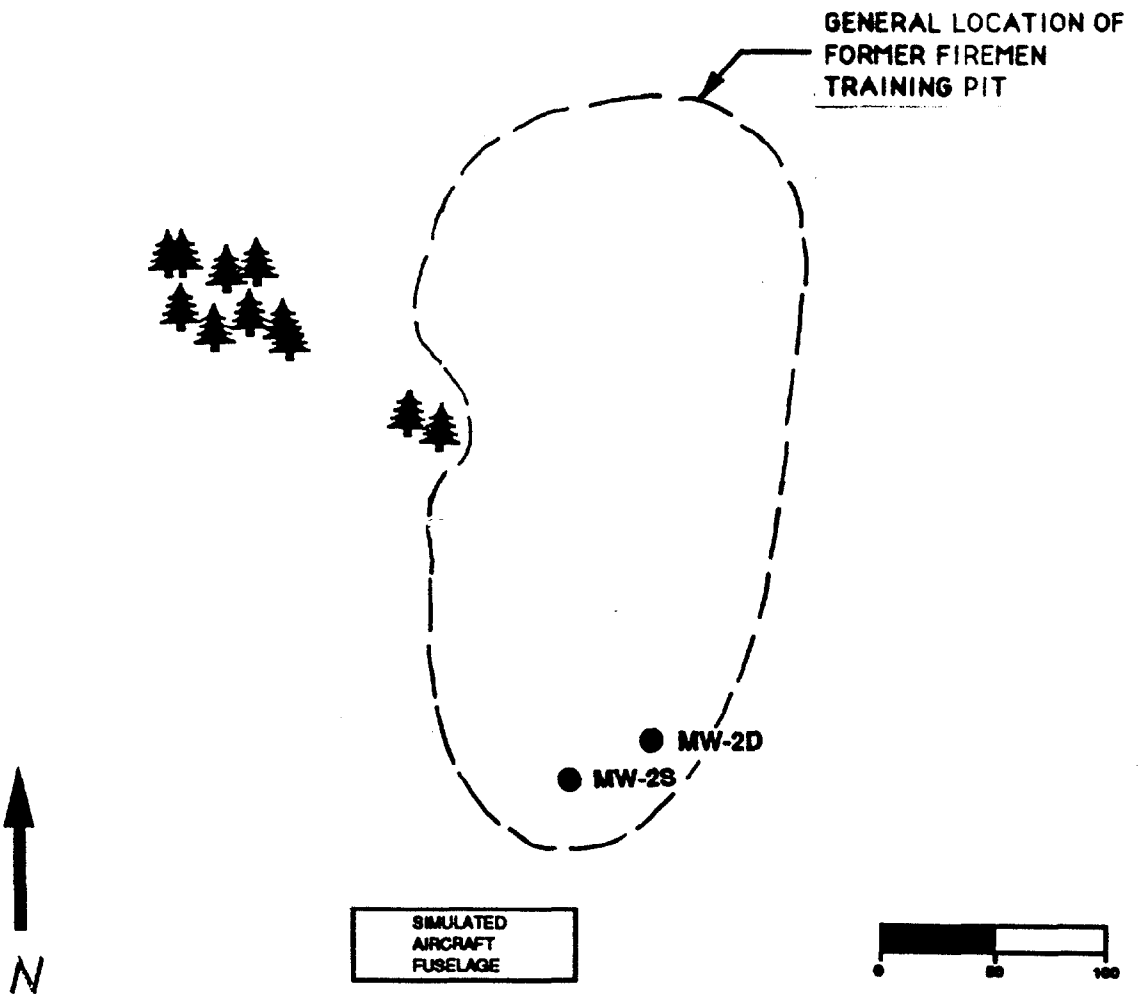
1. FIRE TRAINING AREA
2. WASTE OIL DUMP
3. AVIATION FUEL TANK FARM
4. SCRAPYARD
5. PCB TRANSFORMER

Metcalf & Eddy

FIGURE 1B3-1
FACILITY AND SOURCE AREA LOCATION MAP

SCALE: 1:24,000
BASE MAP: USGS

REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA



ACCESS ROAD

LEGEND

● MONITORING WELL (APPROXIMATE LOCATION)

BASE MAP SOURCE:

FINAL SOIL GAS REPORT
SEPTEMBER, 1990
EBASCO SERVICES, INC.

Metcalf & Eddy

FIGURE 1B3-2
FIRE TRAINING AREA
SOURCE LOCATION MAP

SCALE: AS SHOWN, APPROXIMATE

REVISION OF SITE INVESTIGATION
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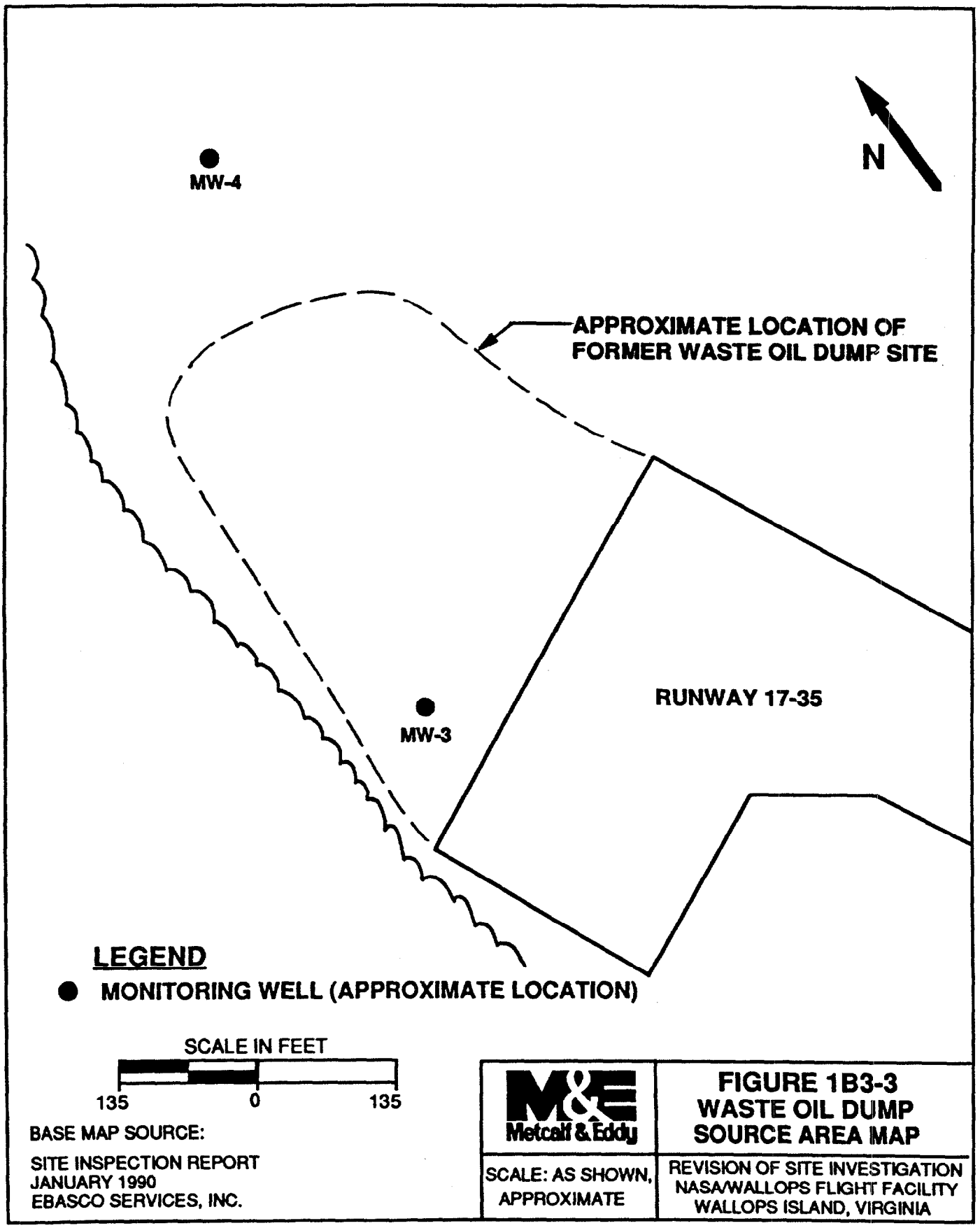
WALLOPS ISLAND, VIRGINIA



BASE MAP SOURCE:

SITE INSPECTION REPORT
JANUARY 1990
EBASCO SERVICES, INC.

Metcalf & Eddy

SCALE: AS SHOWN, APPROXIMATE

FIGURE 1B3-3
WASTE OIL DUMP
SOURCE AREA MAP

REVISION OF SITE INVESTIGATION
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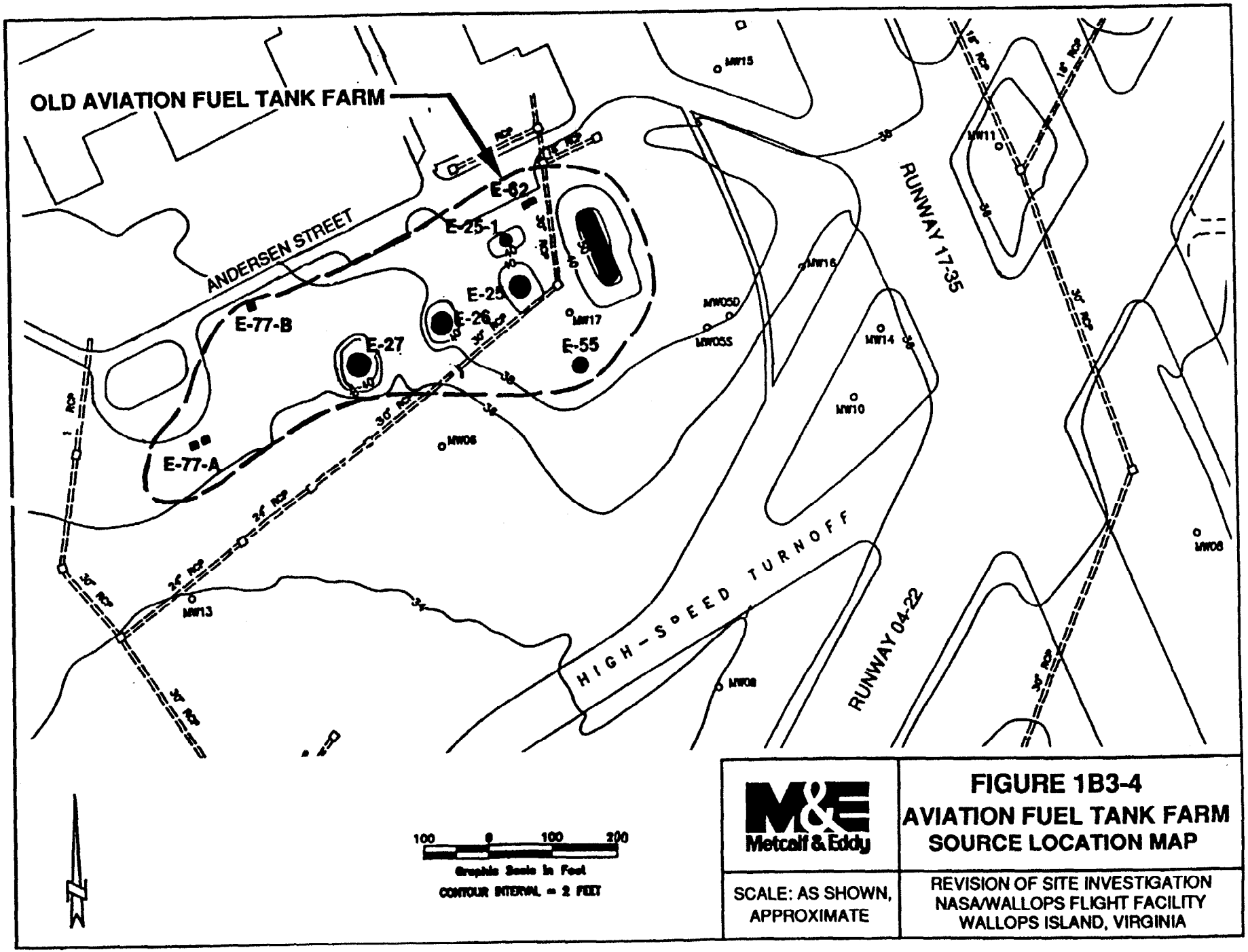
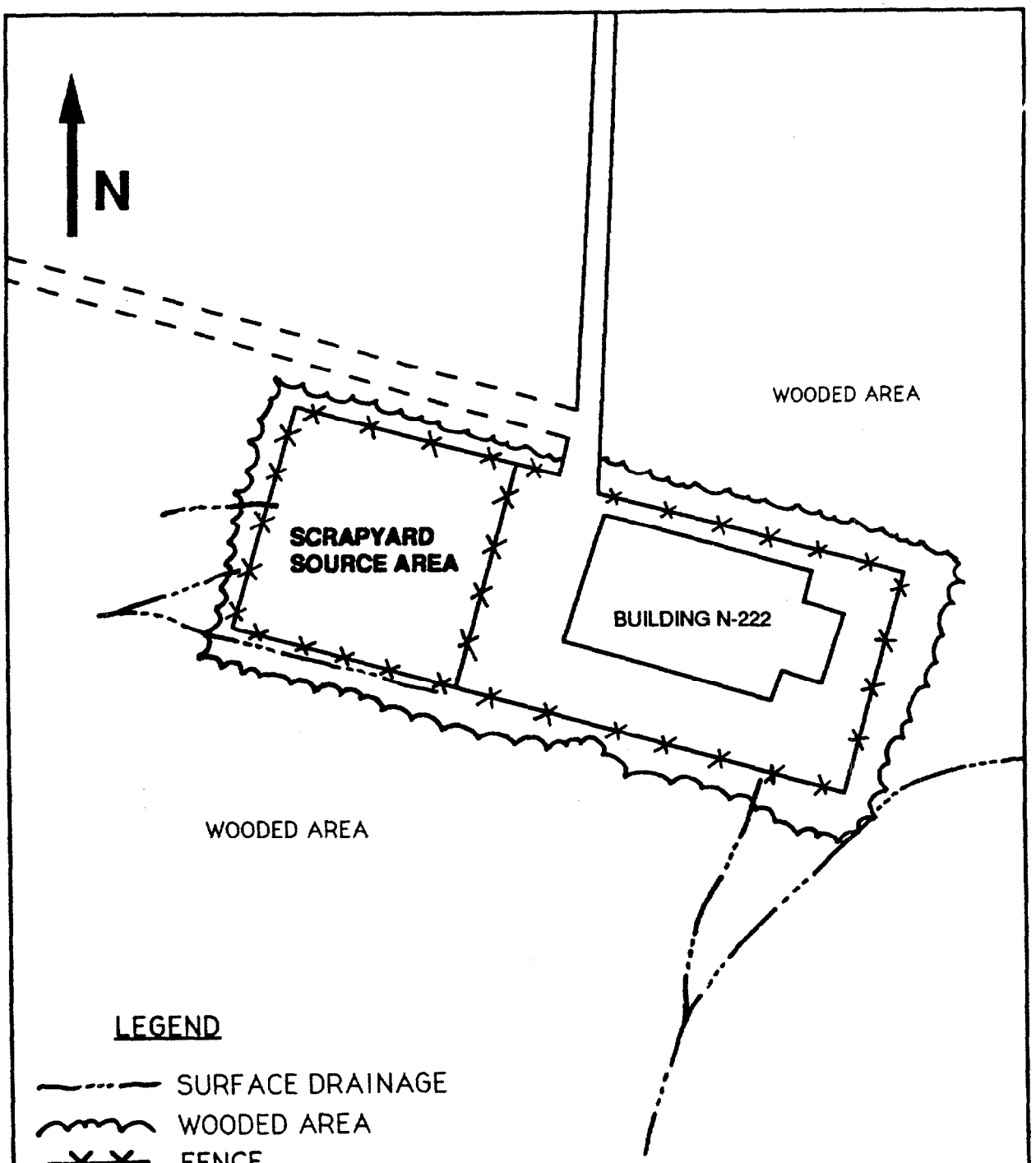
WALLOPS ISLAND, VIRGINIA


OLD AVIATION FUEL TANK FARM
ANDERSEN STREET
E-62
E-25-1
E-25
E-26
E-27
E-55
E-77-B
E-77-A
MW15
MW11
MW16
MW05D
MW05S
MW17
MW14
MW10
MW06
MW13
MW08
RUNWAY 17-35
RUNWAY 04-22
HIGH-SPEED TURNOFF
100 0 100 200
Graphic Scale in Feet
CONTOUR INTERVAL = 2 FEET
Metcalf & Eddy
FIGURE 1B3-4
AVIATION FUEL TANK FARM
SOURCE LOCATION MAP
SCALE: AS SHOWN, APPROXIMATE
REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA



BASE MAP SOURCE:

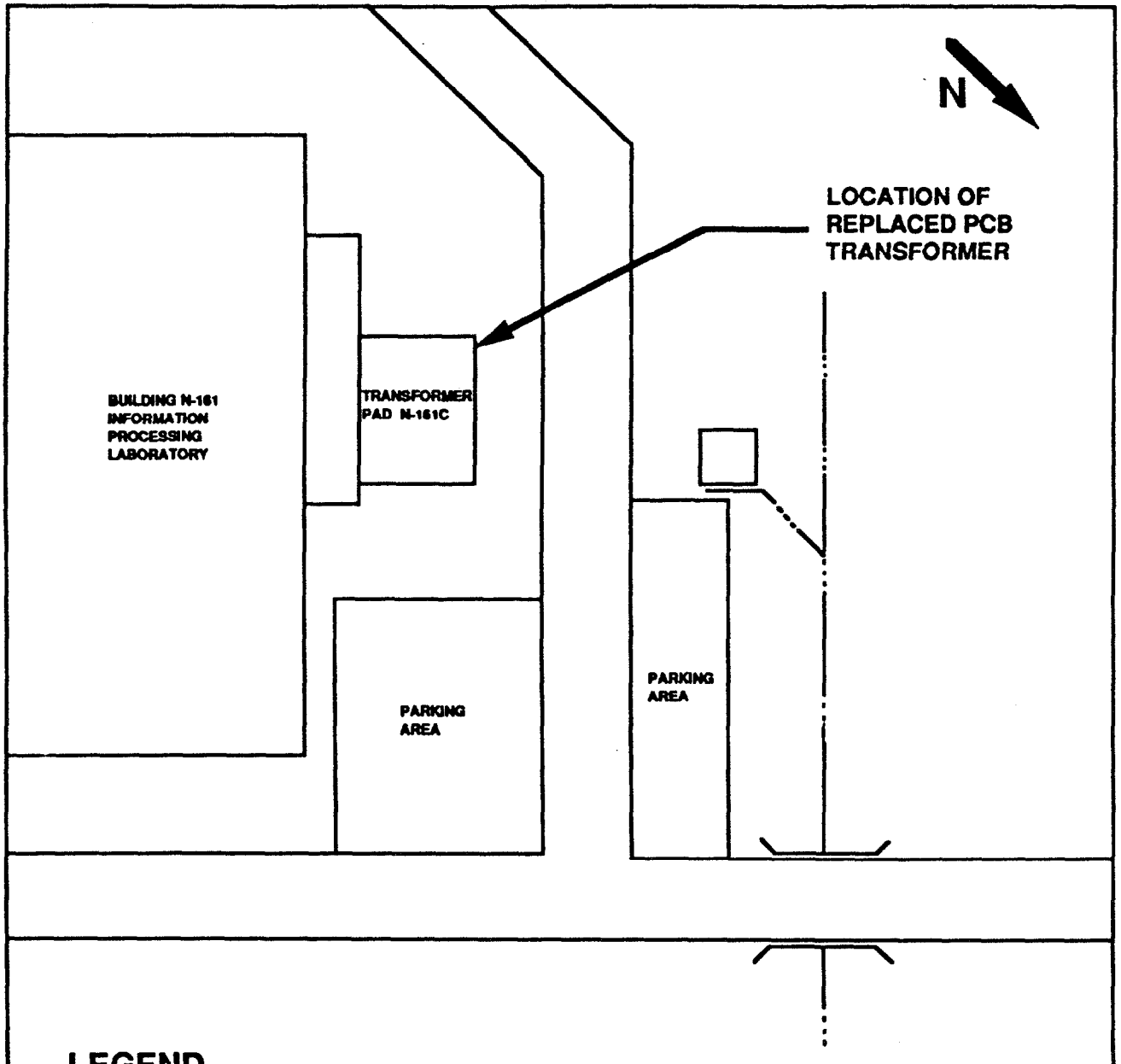
FINAL SUMMARY REPORT
SEPTEMBER, 1990
EBASCO SERVICES, INC.

Metcalf & Eddy

FIGURE 1B3-5
SCRAPYARD SOURCE LOCATION MAP

SCALE : 1 " = 100'
APPROXIMATE

REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA



LEGEND

——- - - —— SURFACE DRAINAGE

BASE MAP SOURCE:

FINAL SUMMARY REPORT
SEPTEMBER, 1990
EBASCO SERVICES, INC.

Metcalf & Eddy

SCALE : 1 " = 50'
APPROXIMATE

FIGURE 1B3-6
PCB TRANSFORMER SOURCE LOCATION MAP

REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA

1E. Give the following population within each radius indicated below. Each radius should begin at the center of each source if the source is small or at the outer edge if the source is large. Count population in overlapping areas only once.

ESTIMATED POPULATION BY SOURCE

RADIUS		Fire Training Area	Waste Oil Dump	Aviation Fuel Tank Farm	Scrapyard/PCB Transformer
1E1.	**0-1/4 mile**	0	0	0	53
1E2.	**1/4-1/2 mile**	2	0	0	33
1E3.	**1/2-1 mile**	104	52	106	68
1E4.	**1-2 miles**	345	177	248	301
1E5.	**2-3 miles**	572	549	496	537
1E6.	**3-4 miles**	873	708	673	738

The population-by-source data provided above is a conservative estimate based upon land area and an average population density computed for rural Accomack County. The density was derived in the following manner. 1990 U.S. Census Population Counts for the Accomack-Northampton Planning District were obtained from the Accomack County Department of Environmental Affairs (Reference 4). The 1990 data is summarized in Table 1E-1. None of the incorporated towns listed in Table 1E-1 are within a 4-mile radius of the source areas identified in the PA/SI Reports. Therefore, the population subtotal for towns was subtracted from the total Accomack County population. The resultant rural population estimate for Accomack County of 21,570 persons was then divided by the estimated land area of 367 square miles to determine the average population density of 59 persons per square mile. This conservative estimate was utilized, along with estimated populated land areas (not including NASA property, marshlands, and water areas) within the designated radii, to determine the

population-by-source data. On-base resident housing data was added to these totals when applicable.

The land area of 367 square miles was derived based on data provided by the Accomack County Department of Environmental Affairs. Accomack County contains 602 square miles of land and water area. The land mass, not including incorporated towns, encompasses approximately 475 square miles, of which the mainland totals 367 square miles, and the remaining 109 square miles are tidal marshes and barrier islands (Reference 5).

Population estimates for the 0 - 1/4-mile radii include Navy and Coast Guard personnel and families living in resident housing located on the WFF Main Base. The population numbers for these radii were taken from a previous NASA report (Reference 6).

TABLE 1E-1.

1990 U.S. CENSUS POPULATION COUNTS

ACCOMACK-NORTHAMPTON PLANNING DISTRICT

LOCALITY	POPULATION COUNTS	HOUSING UNITS
Accomack County	31,703	15,840
INCORPORATED TOWNS		
Accomac	466	205
Belle Haven	526	245
Bloxom	357	175
Chincoteague	3,572	3,167
Hallwood	228	115
Keller	235	107
Melfa	428	191
Onancock	1,434	705
Onley	532	276
Painter	259	113
Parksley	779	393
Saxis	367	192
Tangier	659	277
Wachapreague	291	223
Towns Subtotal	10,133	6,384

NOTE: The incorporated towns listed above are not within a 4-mile radius of the WFF source areas.

Source: Accomack County Department of Environmental Affairs, "1990 U.S. Census Population Counts - Accomack-Northampton Planning District."

1F. Describe any prior spills (e.g., quantity of the spill, hazardous substances) that occurred at the facility.

The EPA has indicated on the deficiency checklist that this data, provided in the PA/SI Reports, is acceptable. No further discussion is required.

1G. Describe facility and source security and access (e.g., fences, patrols, gates, etc.).

The WFF is comprised of three separate areas designated as the Main Base, Mainland, and Wallops Island. All of the source areas are located on the WFF Main Base, which is bordered by inland creeks, waterways, and tidal wetlands to the northeast and northwest. A chain-link fence prevents unauthorized access along the southeast and southwest land boundaries, and ingress and egress to the Main Base are controlled by an entrance gate manned by guard personnel. All personnel entering the facility must have a badge identification and vehicle pass, and all visitors to the Main Base must obtain temporary visitor badges and vehicle passes. In addition, security personnel complete routine security patrols (Reference 7).

Of the identified sources, the Scrapyard is the only individually fenced area, and is secured by locking gates. The PCB transformer (N161C) has been replaced by a non-PCB transformer (Reference 8), and a fence has been erected around the concrete pad to prevent access to the transformer.

SECTION TWO: WASTE/SOURCE INFORMATION

2A. Describe as specifically as possible the types of wastes produced at the facility and the methods in which these wastes were treated, stored, or disposed.

The EPA has indicated on the deficiency checklist that the information for items 2A through 2G was provided in the PA/SI Reports and is acceptable. No further discussion is required.

2B. Describe as specifically as possible the amount (volume, weight, etc.) of each waste type produced and the form in which it was discharged or disposed (e.g., solid, liquid) at the facility.

See 2A above.

2C. Describe each source type (e.g., landfill) located within the facility boundary.

See 2A above.

2D. Describe as specifically as possible the constituents (concentrations of individual constituents) of each waste type disposed in each source.

See 2A above.

2E. Describe as specifically as possible the amount of waste treated, stored, or disposed of in each source (e.g., landfills, impoundments, tanks).

See 2A above.

2F. Determine the depth at which wastes were deposited in each source.

See 2A above.

2G. Describe as specifically as possible the condition/integrity of each source (e.g., Do landfills have liners or caps?).

See 2A above.

2H. Describe any secondary containment features/structures associated with each source (e.g., precipitation run-on and runoff systems, leachate collection systems, gas collection systems).

The Scrapyard, PCB Transformer, and Fire Training Area have no point source discharges to the WFF stormdrain system or surface waters. Runoff from the area of contamination at the Scrapyard occurs for short distances (less than 100 feet) in several shallow drainage ditches. The ditches, which have apparently resulted from erosion due to concentrated flow, discharge to a heavily wooded, low-lying area immediately east and southeast of the source area. Stormwater runoff from the Scrapyard source area appears to accumulate in this low-lying area, with no evidence of direct discharge to surface waters.

Runoff from the PCB Transformer source area is collected in a series of shallow, grassed drainage ditches which eventually discharge to a large grassed area. The grassed area, located east of the source area, has no apparent direct discharge to surface waters.

Surface runoff from the Fire Training Area is not collected in drainage conveyances. Runoff apparently occurs by overland sheet flow, with accumulation occurring in several low-lying areas immediately north and northeast of the source area. A protective earthen berm, constructed as a protective measure in the event of an explosion at the magazine area, is located approximately 300 feet north of the source area and acts as a barrier to any further drainage in that direction. The topography eventually rises slightly to the northeast, thus limiting further drainage in that direction as well. The Fire Training Area thus apparently has no direct discharge to surface waters.

Surface runoff from the AFTF occurs by overland flow to the south of the source area. Runoff is apparently then collected by the WFF stormdrain system at several downgradient

inlets to prevent ponding in the vicinity of the runway. In addition, two stormdrain inlets, one located approximately 400 feet south and another located approximately 550 feet southwest of the tank locations, may receive runoff from larger storm events. Based on the topography, runoff from the AFTF not collected by the upper inlets would generally accumulate in a low-lying area located between the upper and lower inlets. The ground surface rises gently between the low-lying area and the lower stormdrain inlets, indicating that some flooding would probably be required in order for runoff to reach the lower inlets. All of the inlets in the vicinity feed a central stormdrain line. The stormdrain passes under Runway 04-22 and discharges to an unnamed tributary to Jenneys Gut. The flow distance to Jenneys Gut is approximately 2500 feet. Jenneys Gut discharges to Mosquito Creek approximately 4000 feet beyond the point of entry of the unnamed tributary.

Surface runoff from the Waste Oil Dump source area occurs by overland flow to tidal wetlands bordering Little Mosquito Creek. Little Mosquito Creek discharges to Mosquito Creek, which discharges to Chincoteague Bay and, ultimately, Chincoteague Inlet.

2I. Describe the size, volume, capacity, and area of each source.

A source is defined in 55 FR 241 as "any area where a hazardous substance has been deposited, stored, or disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance. Sources do not include those volumes of air, ground water, surface water, or surface water sediments that have become contaminated by migration." Exceptions to that definition are for either a groundwater plume or contaminated surface sediments with no identified source. In those cases, the plume or contaminated sediments are to be considered a source (Reference 2). The primary definition, with no exceptions, is used to characterize the WFF source areas.

Fire Training Area:

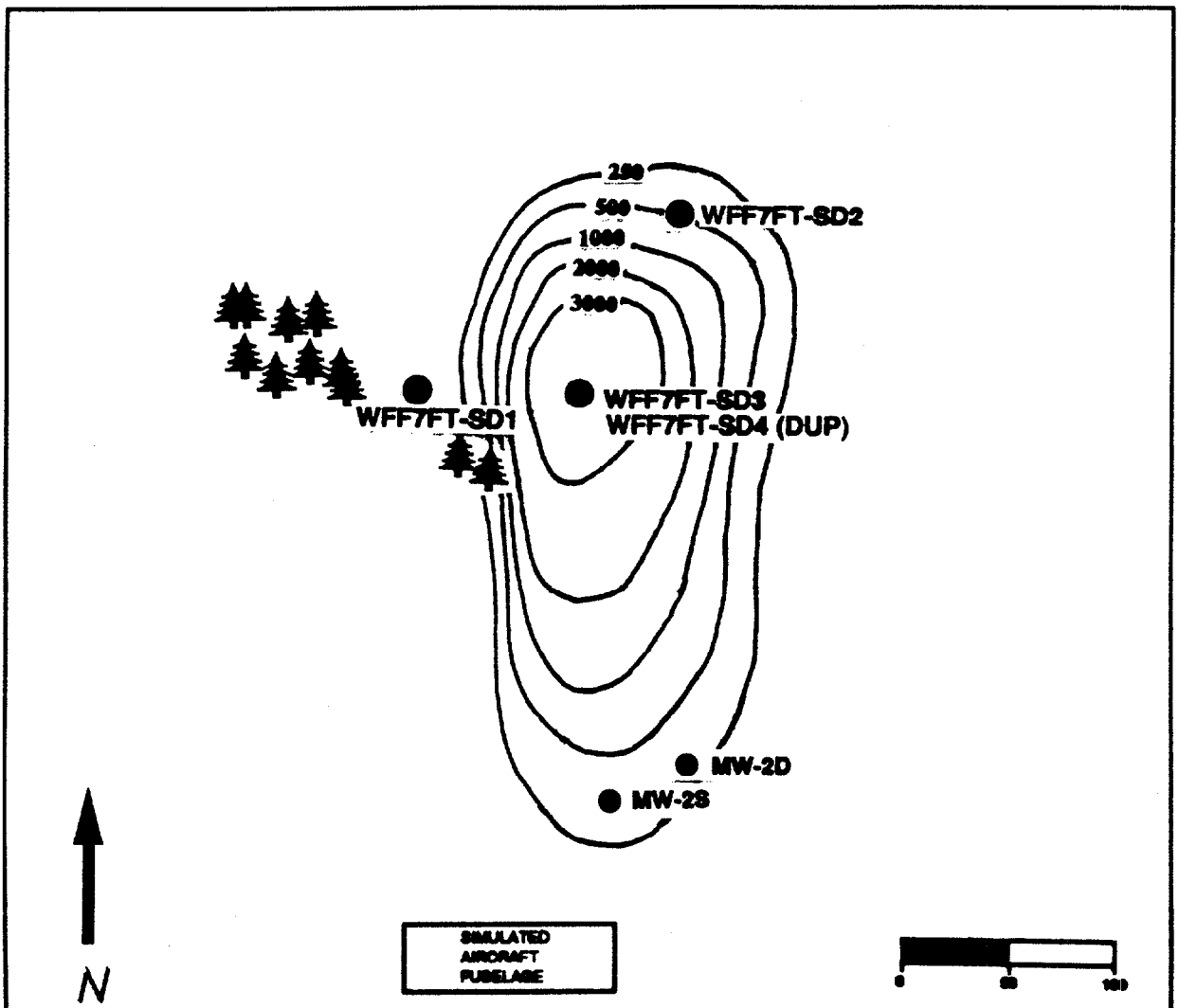
The Fire Training Area is a one-acre site located north of Runway 10-28. The 1989 SI Report indicated that waste fuel was discharged at the site, ignited, and then extinguished as part of firemen training exercises. The SI also indicated that more than 50 drums were stored

in the area. Following a removal order from the Commonwealth of Virginia, the drums were removed from the site. In addition, an unknown quantity of contaminated soil was reportedly excavated and disposed at an Accomack County Landfill (Reference 3).

A soil gas survey was completed at the Fire Training Area in September 1989, to evaluate the extent of soil contamination and identify potential groundwater contamination resulting from previous fire training activities. The results of the survey, summarized in the Final Soil Gas Report (Reference 9), will be utilized to evaluate the areal extent of the source area.

The soil gas survey detected trichloroethylene (TCE), perchloroethylene (PCE), toluene, and other volatile hydrocarbons. The PCE was the most widely detected, and that data was therefore utilized in preparing the isoconcentration plot presented in the Final Soil Gas Report.

The areal extent of suspected soil contamination is estimated to be 4200 square yards based upon the isoconcentration plot, and is presented graphically in Figure 2I-1. The volume of the source is estimated to be 15,400 cubic yards. This conservative estimate assumes that soil contamination extends from two feet below the ground surface to groundwater throughout the area defined by the isoconcentration plot. The contamination was not assumed to extend from the ground surface as an unknown quantity of contaminated soil was reportedly excavated from the site in 1986 during a cleanup effort required by the Commonwealth of Virginia. (Reference 3.)



ACCESS ROAD

LEGEND

- ● MONITORING WELL (APPROXIMATE LOCATION)
- —1000— SOIL GAS CONCENTRATION (ppb)
- ● APPROXIMATE SEDIMENT SAMPLE LOCATION

BASE MAP SOURCE:

FINAL SOIL GAS REPORT
SEPTEMBER, 1990
EBASCO SERVICES, INC.

Metcalf & Eddy

FIGURE 2I - 1
FIRE TRAINING AREA
SOURCE AREA MAP

SCALE: AS SHOWN, APPROXIMATE

REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA

Surface soil samples were collected in May and August 1992, as part of this report, to evaluate shallow soil contamination and migration of hazardous substances by surface runoff from the Fire Training Area. The analytical results of that sampling effort, presented in Appendix C, did not indicate surface migration of hazardous substances. Sampling locations are indicated on Figure 2I-1.

Waste Oil Dump:

The Waste Oil Dump site is located at the north end of Runway 17-35. Following a removal order from the Commonwealth of Virginia, an unknown quantity of contaminated soil was reportedly excavated from the site in 1986 and disposed at an Accomack County Landfill (Reference 3).

Soil sampling completed at the Waste Oil Dump site in June 1990 included collection of four soil samples for TCL/TAL analyses. The results of that sampling effort, summarized below, are included in the Final Summary Report (Reference 1) submitted to NASA by Ebasco Services, Inc. in September 1990.

Trichloroethane (TCA) and trichloroethylene (TCE) were detected in soil samples collected from the Waste Oil Dump site at levels very close to detection limits (13 μg/Kg). Maximum levels detected for TCA were 9 μg/Kg and 31 μg/Kg for TCE. Semi-volatile organic contamination measured above detection limits included only two isolated detections. Bis(2-Ethylhexyl) phthalate was detected in one soil sample at a concentration of 16,000/μg/Kg (detection limit of 1000 μg/Kg). In another sample, 2,6-Dinitrotoluene was detected above the 720 μg/Kg detection limit at a concentration of 1000 μg/Kg. No analyses were performed for evaluation of total petroleum hydrocarbon contamination.

Metals concentrations in the soil samples were reported in the Final Summary Report to be within acceptable levels. Comparison of that data to background soils data collected during later investigations at the AFTF indicated arsenic and cadmium at levels close to detection limits. Slightly elevated levels were indicated for: copper at 8.6 mg/Kg when compared to background at a maximum detection of 0.2 mg/Kg; and lead at a range of 3.1 to 25 mg/Kg

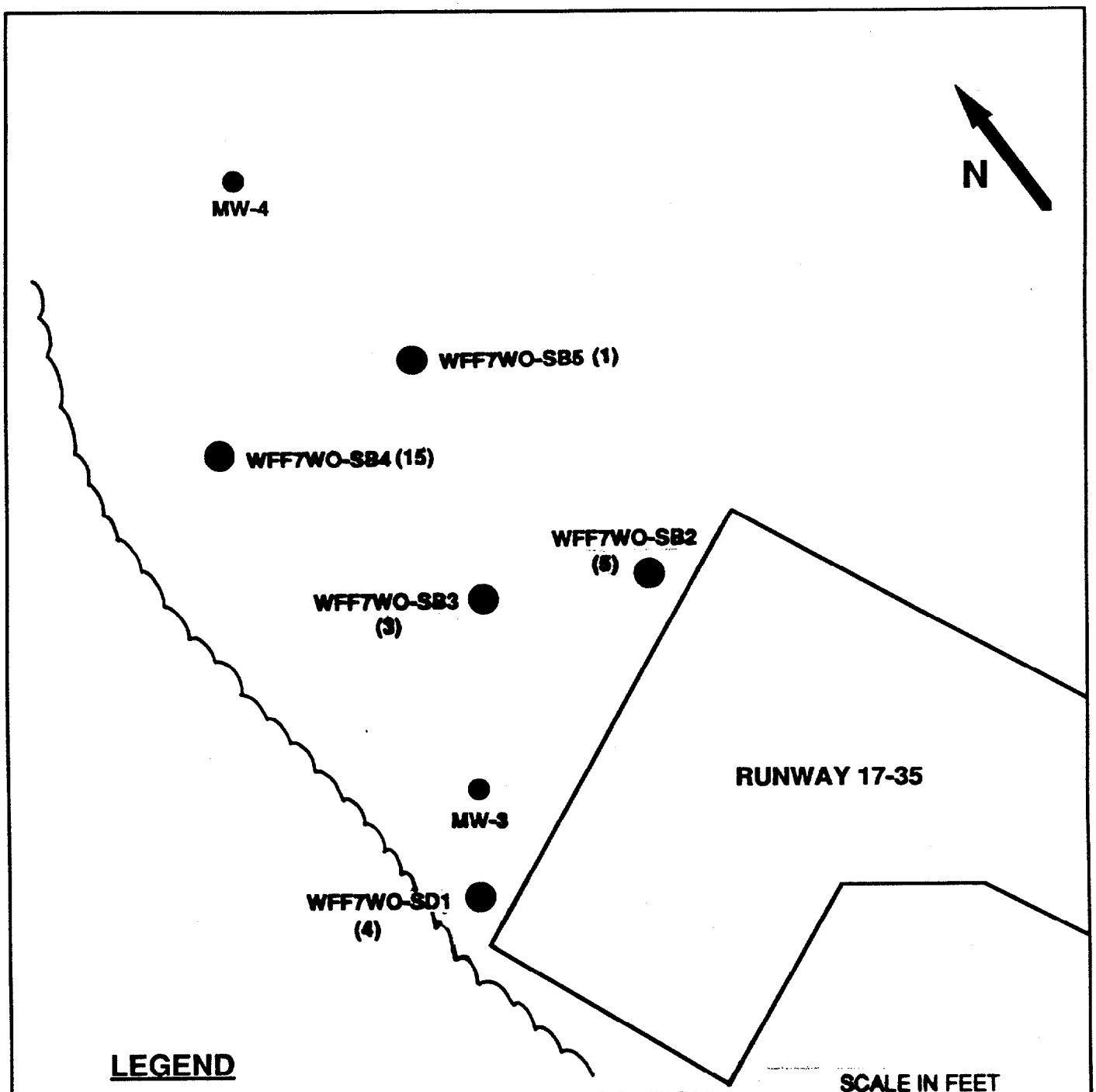
when compared to background at a maximum detection of 0.6 mg/Kg (References 1, 10). PCB contamination was not detected in any of the soil samples collected at the Waste Oil Dump site, and pesticide detections were limited, with maximum detections of 310 μg/Kg for 4,4'-DDT and 43 μg/Kg for 4,4'-DDD (Reference 1).

Conclusions in the 1990 Final Summary Report (Reference 1) stated that evidence did not exist to justify classification of the Waste Oil Dump Site as contaminated. However, since no total petroleum hydrocarbon (TPH) analyses were completed in previous investigations, five additional soil boring samples were collected at varying depths in May 1992 to evaluate the presence of waste oil or fuel oil contamination at the site. The sampling locations and depths are indicated in Figure 2I-2. Sampling methodologies are presented in the Field Sampling and Analysis Plan (May 1992) included in Volume II as Reference 11 to this report.

The soil samples were analyzed for total petroleum hydrocarbon (TPH) contamination using the Modified EPA 8015 Method (GC-FID). In previous Metcalf & Eddy investigations, that analytical method has been found to generally yield the most reliable results for hydrocarbon contamination in the soil types encountered at the WFF. The TPH analyses did not detect any remaining waste/fuel oil contamination at the Waste Oil Dump site. Based on this data and the previously completed investigations, no evidence exists to indicate remaining soil contamination in this area from the previous waste disposal activities, and the cleanup effort completed in 1986 appears to have removed the contaminated soil from the Waste Oil Dump site.

Aviation Fuel Tank Farm (AFTF):

The Aviation Fuel Tank Farm (AFTF) is a ten-acre site located west of the intersection of Runways 04-22 and 17-35. A total of 16 underground storage tanks (USTs) and all associated valves, piping, and structures were removed from the AFTF site in the Fall of 1991. A total of approximately 4700 tons of contaminated soil were also removed during the tank removal effort. Photoionization detector (PID) readings taken prior to backfilling of the excavations indicated remaining soil contamination. Those areas, as identified by NASA personnel, were sampled in May 1992 to evaluate remaining soil contamination.



BASE MAP SOURCE:

SITE INSPECTION REPORT
JANUARY 1990
EBASCO SERVICES, INC.

Metcalf & Eddy

FIGURE 2I - 2
WASTE OIL DUMP
SAMPLING LOCATIONS

SCALE: AS SHOWN, APPROXIMATE

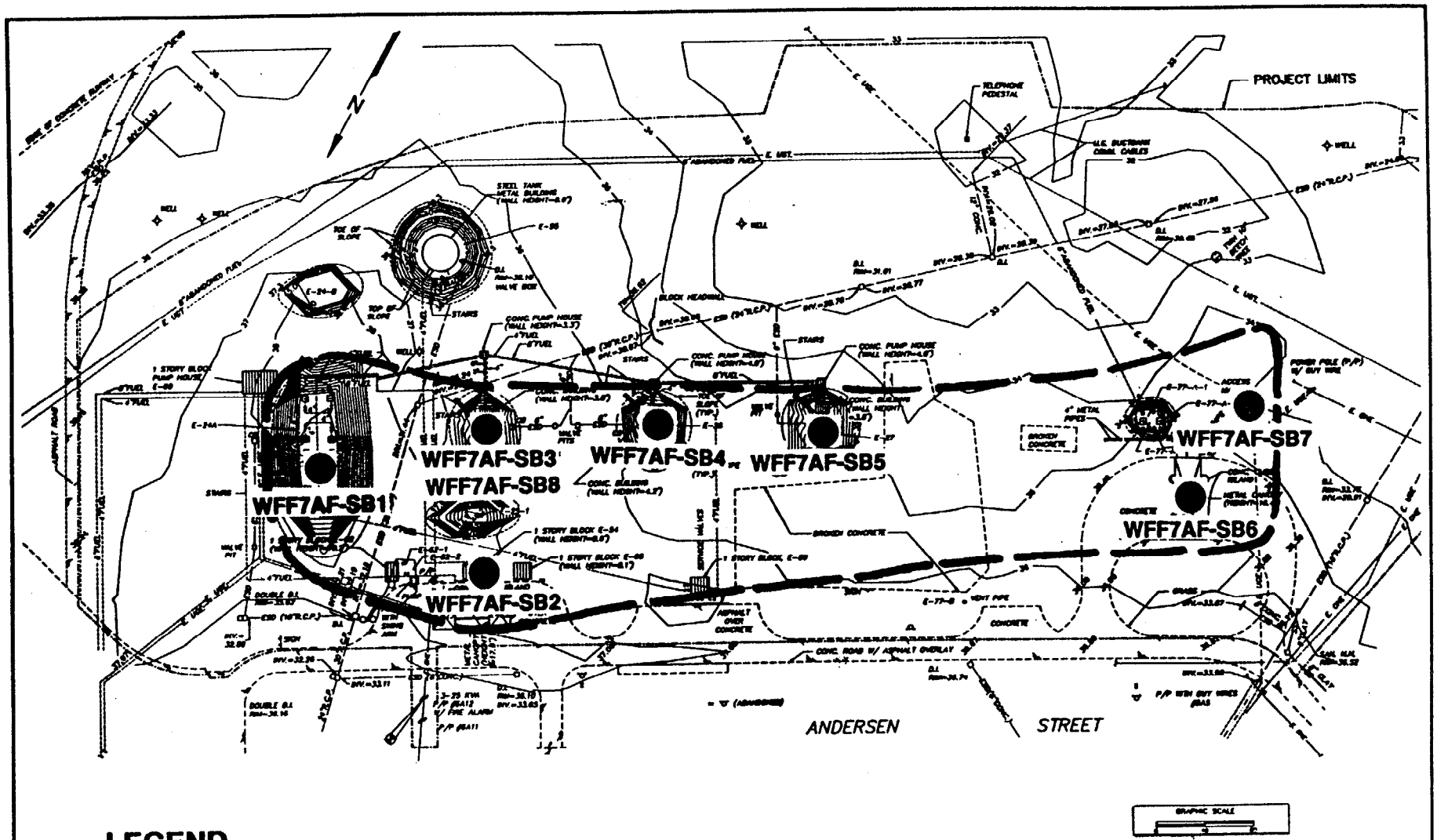
REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA

A very limited sampling effort was conducted, including one soil boring sample collected from each of the identified areas, and one duplicate sample for quality assurance/quality control (QA/QC) purposes. Sampling locations are indicated on Figure 2I-3. Analytical parameters were limited to BTEX, lead, and manganese. Some remaining contamination was identified from those analytical results. However, given the limited sampling approach, the areas previously identified by PID readings and reported by NASA personnel are assumed to have remaining contamination. The areal extent of soil contamination at the AFTF is estimated to be approximately 15,400 square yards. This very conservative estimate assumes that the areas between the former tank locations are also contaminated. The volume of soil contamination is conservatively estimated to be approximately 56,520 cubic yards, assuming a soil contamination depth of 11 feet, which was the maximum sampling depth.

Scrapyard:

The Scrapyard site has been used for storage of metal wastes, including empty drums, used batteries, and used rocket motors (Reference 12). An extensive sampling effort was conducted at the Scrapyard in 1990 to further evaluate the extent of contamination identified during the Site Investigation. The results of that effort, summarized in the Final Summary Report, indicated that PCB soil contamination exceeded EPA action levels of 50 ppm (Reference 1). The Final Summary Report also indicated mercury detections in two shallow soil samples and one duplicate sample. The mercury detections ranged from 0.28 to 0.96 mg/Kg, and were described as localized soil contamination based on a reported maximum concentration of 0.08 mg/Kg of mercury in U.S. soils.

To confirm the areal extent of PCB contamination and evaluate further migration due to surface runoff, three shallow soil samples were collected at a depth of 6 inches from the Scrapyard site in May 1992. PCB contamination was detected in only one of the three samples (SY-SD3). These sampling locations and the estimated areal extent of PCB contamination, based on this sampling effort and previous investigations, are presented in Figure 2I-4.



LEGEND

- APPROXIMATE SOIL BORING LOCATION
- BOUNDARY OF ESTIMATED SOIL CONTAMINATION AREA

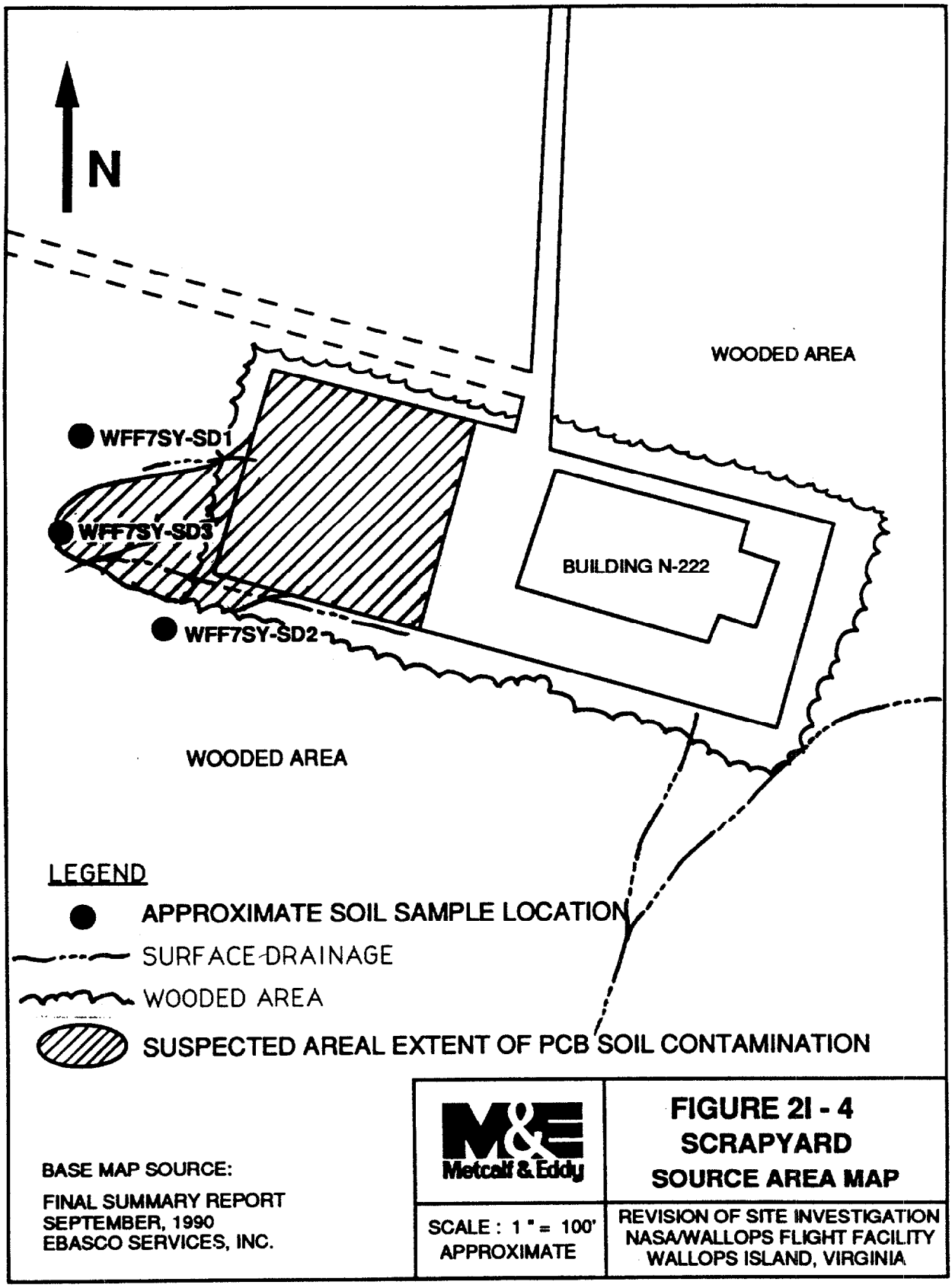
BASE MAP SOURCE: NASA DWG. NO. 10458

Metcalf & Eddy

FIGURE 2I - 3
AVIATION FUEL TANK FARM
SOURCE AREA MAP

SCALE: AS SHOWN, APPROXIMATE

REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA


N
WOODED AREA
WFF7SY-SD1
WFF7SY-SD3
BUILDING N-222
WFF7SY-SD2
WOODED AREA
LEGEND
APPROXIMATE SOIL SAMPLE LOCATION
SURFACE DRAINAGE
WOODED AREA
SUSPECTED AREAL EXTENT OF PCB SOIL CONTAMINATION
BASE MAP SOURCE:
FINAL SUMMARY REPORT
SEPTEMBER, 1990
EBASCO SERVICES, INC.
Metcalf & Eddy
FIGURE 2I - 4
SCRAPYARD
SOURCE AREA MAP
SCALE : 1 " = 100'
APPROXIMATE
REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA

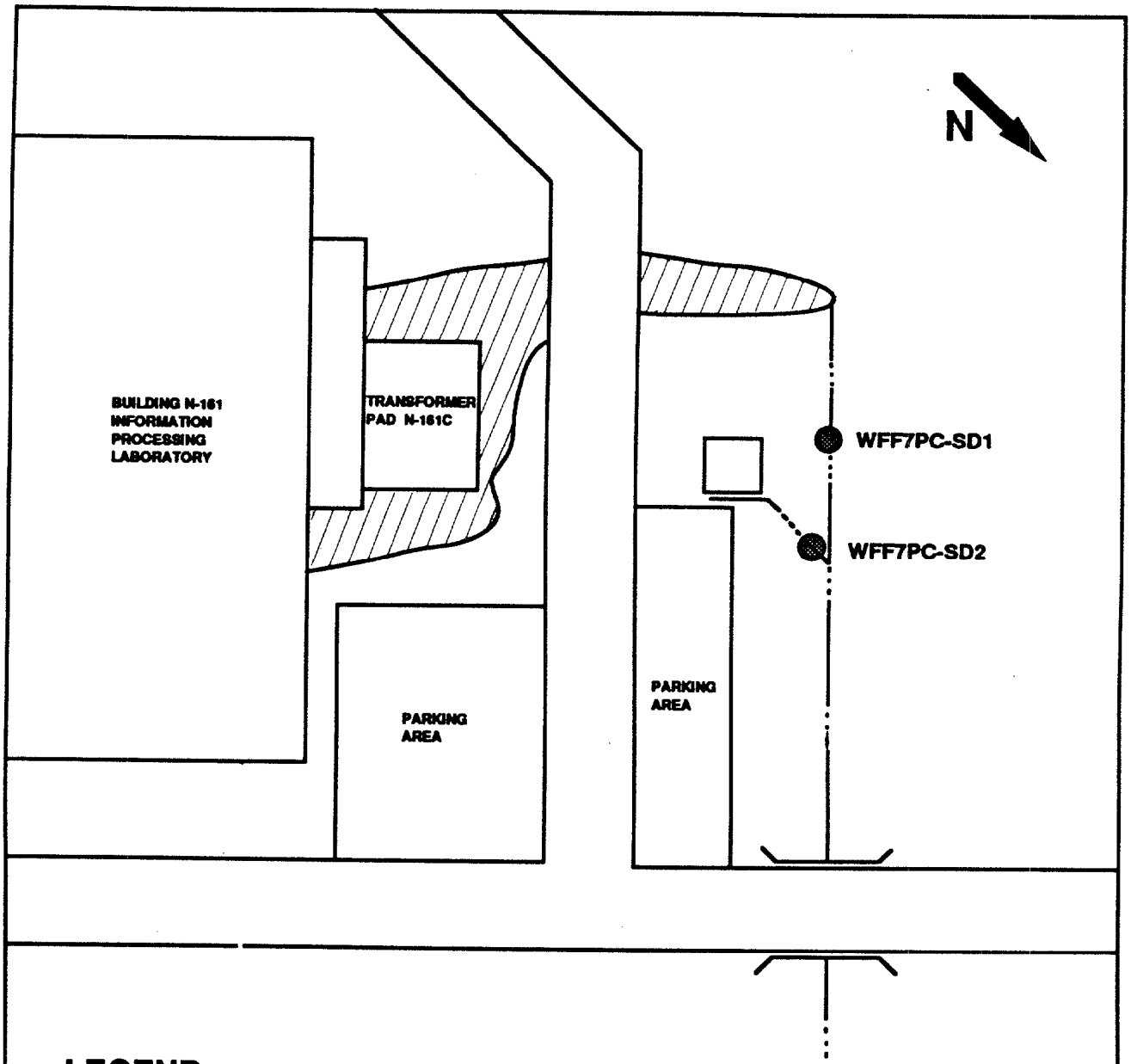
Based on the estimated areal extent of 3325 square yards, and assuming a depth of 10 inches, the volume of contaminated soil is estimated to be 925 cubic yards. Ten inches is the minimum excavation depth for cleanup actions under the Toxic Substances Control Act (TSCA) at nonrestricted access areas. The Scrapyard meets the EPA definition of "nonrestricted access area" as the gate is typically open during working hours, and the PCB contamination extends beyond the fenced area. The localized mercury contamination reported in the Final Summary Report can be addressed as part of the PCB cleanup action.

PCB Transformer:

An outdoor PCB transformer (N-161C) was formerly located behind Building N-161. The transformer, reported to be leaking in 1988 PA Report, was replaced by a non-PCB transformer following completion of that report (Reference 8).

A sampling effort conducted in 1990 and summarized in the Final Summary Report defined the areal extent of PCB soil contamination at the former location of the PCB transformer. That sampling effort indicated that the concrete transformer pad was not contaminated (Reference 1).

To confirm the areal extent of contamination and evaluate further migration due to surface runoff, two sediment samples were collected in May 1992 for PCB analyses. The samples were collected in localized drainage conveyances immediately downgradient of the site, and beyond the previously defined limits of contamination. PCB contamination was not detected in the sediment samples, indicating that migration by surface runoff is not detectable. The sample locations and the previously defined areal extent of PCB contamination are presented in Figure 2I-5. The estimated areal extent is 500 square yards, and assuming a depth of 10 inches, the volume is estimated to be 140 cubic yards.



LEGEND

- APPROXIMATE SOIL SAMPLE LOCATION
- SURFACE DRAINAGE
- SUSPECTED AREAL EXTENT OF PCB SOIL CONTAMINATION

BASE MAP SOURCE:

FINAL SUMMARY REPORT
SEPTEMBER, 1990
EBASCO SERVICES, INC.

Metcalf & Eddy

FIGURE 2I - 5
PCB TRANSFORMER SOURCE AREA MAP

SCALE : 1 " = 50'
APPROXIMATE

REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA

SECTION THREE: GROUNDWATER PATHWAY INFORMATION

3A. Determine if the groundwater within a 4-mile radius of each source is used for any of the following purposes and locate the wells on a map. Each radius should begin at the center of each source if the source is small or at the outer edge if it is large. Provide the depth of each well.

3A1. private or public drinking-water source

3A2. irrigation of commercial food or commercial forage crops (include acres)

3A3. commercial livestock watering

3A4. commercial aquaculture

3A5. water for major or designated recreational area, excluding drinking-water use

3A6. standby wells used for drinking water at least once a year.

The EPA indicated on the deficiency checklist that this information was provided in the PA/SI reports but was unacceptable. EPA has requested a map locating all the wells within a 4-mile radius of each source. In addition, EPA has requested information on the depth and use of each well.

A USGS topographic map is included in Appendix A as Figure 3A-1. The map provides the locations and Commonwealth of Virginia State Water Control Board (SWCB) three-digit well identification numbers or Virginia Department of Health Public Water Supply identification numbers (indicated as PWS plus a four-digit number). The well data was obtained from the SWCB Groundwater Program through a printout of the STORET Database (Reference 13). Additional data regarding NASA wells and public water supply systems was added to the table. The data on the public water supply systems was provided by the Virginia Department of Health, Office of Water Programs (Reference 14). Groundwater wells identified within a 4-mile radius of WFF and the drinking water wells actually located on WFF are included on a single map (Figure 3A-1) for use in evaluating each source. Monitoring and observation wells installed on the WFF Main Base for investigative purposes have not been included. A listing of the wells, including available depth and usage data, is presented as Table 3A-1.

TABLE 3A-1. GROUNDWATER WELLS WITHIN A 4-MILE RADIUS OF WFF

SWCB*-ID	LATITUDE	LONGITUDE	DEPTH OF SCREEN	OWNER	USAGE
-	-	-	-	NASA (F-189)	Not in use
-	-	-	-	NASA (A-131)	Not in use
-	-	-	-	NASA (H-114)	Retired
100-00017	37 56 46.00	75 27 32.60	-	NASA (NOAA)	Public Water Supply
100-00028	37 56 32.60	75 27 20.60	217	Town of Chincoteague (#4)	Public Water Supply
100-00032	37 56 26.00	75 27 23.00	256	Town of Chincoteague (#5)	Public Water Supply
100-00165	37 59 11.00	75 25 28.00	272	First Charter Land Corp. (#5)	Out of service
100-00198	37 56 24.00	75 28 48.00	225	NASA (F-113)	Public Water Supply
100-00200	37 56 18.00	75 28 48.00	54	NASA (F-31)	Public Water Supply
100-00202	37 52 19.00	75 26 53.00	177	NASA - Wallops Island	Fire Control
100-00203	37 56 16.00	75 28 44.00	62	NASA (F-35)	Public Water Supply
100-00204	37 56 24.00	75 28 16.00	40	NASA (D-39)	Public Water Supply
100-00205	37 56 21.00	75 28 23.00	120	NASA (D-46)	Out of service
100-00206	37 56 15.00	75 28 39.00	59	NASA (F-30)	Out of service
100-00207	37 56 26.00	75 28 07.00	60	NASA (A-40)	Out of service
100-00208	37 56 20.00	75 28 50.00	89	NASA (H-115)	Public Water Supply
100-00209	37 56 16.00	75 28 50.00	45	NASA (H-23)	Out of service
100-00210	37 56 26.00	75 28.42.00	79	NASA (F-112)	Public Water Supply
100-00216	37 59 20.00	75 32 05.00	130	VA Department of Highways	Public Institution
100-00219	37 56 22.00	75 28 02.00	-	Navy, Wallops Station	Not in Use
100-00234	37 54 15.40	75 30 09.70	300	Richard Thornton, Jr.	Domestic
100-00258	37 58 37.00	75 32 18.00	252	H.E. Kelly Co.	Commercial
100-00263	37 56 00.80	75 29 11.80	31	Wallops Landfill	Other
100-00264	37 55 38.60	75 32 53.70	-	Page Fisher	Domestic
100-00265	37 56 26.00	75 27 25.00	50	Town of Chincoteague (#3)	Out of service
100-00295	37 53 55.10	75 32 25.40	215	Eddie Planter	Domestic
100-00297	37 53 43.60	75 33 02.00	-	Eleanor Taybron	Domestic
100-00298	37 53 30.00	75 33 02.00	238	Jack Cutler	Domestic
100-00299	37 53 52.40	75 33 16.00	240	Clarence Wright	Domestic
100-00300	37 53 53.70	75 33 29.70	60	A.J. Gray & Son	Domestic
100-00301	37 53 52.70	75 33 27.90	280	A.J. Gray, Jr. Hog Farm	Agricultural

* SWCB - State Water Control Board

Source: References 13, 14.

TABLE 3A-1 (CONTINUED)

100-00302	37 53 23.30	75 32 59.10	235	Elsie Mears	Domestic
100-00303	37 53 49.30	75 33 10.50	235	Banton Cropper	Domestic
100-00304	37 53 39.20	75 33 02.20	240	Mrs. John Lewis	Domestic
100-00307	37 52 27.30	75 31 55.80	212	Gregory Ellis	Domestic
100-00308	37 55 38.60	75 32 53.70	180	Hastings Trucking Co.	Domestic
100-00320	37 56 41.30	75 27 14.00	225	Town of Chincoteague (#6)	Public Water Supply
100-00363	37 53 03.00	75 31 02.00	-	J&J Enterprises	Observation Well
100-00365	37 58 37.80	75 32 17.90	243	H.E. Kelly & Co.	Commercial
100-00375	37 55 30.50	75 33 03.40	280	Accomack County Schools	Public Water Supply
100-00377	37 58 37.80	75 32 17.90	130	H.E. Kelly & Co.	Commercial
100-00378	37 57 56.00	75 28 10.90	105	Phillip Hickman	Domestic
100-00411	37 53 47.40	75 33 13.10	-	Accomack County Schools	Public Water Supply
100-00417	37 52 25.00	75 32 17.00	140	Chesser Brothers	Observation Well
100-00418	37 52 25.00	75 32 17.00	206	Chesser Brothers	Observation Well
100-00419	37 52 25.00	75 32 17.00	300	Chesser Brothers	Observation Well
100-00434	37 56 41.30	75 27 14.00	1000	NASA (#29)	Geothermal
100-00435	37 56 04.90	75 30 35.30	1018	NASA (#48)	Geothermal
100-00437	37 53 18.90	75 30 03.30	1038	NASA (#57)	Geothermal
100-00448	37 56 35.00	75 27 15.00	52	SWCB (#115A)	Observation Well
100-00449	37 56 35.00	75 27 15.00	138	SWCB (#115B)	Observation Well
100-00450	37 56 35.00	75 27 15.00	222	SWCB (#115C)	Observation Well
100-00451	37 56 35.00	75 27 15.00	249	SWCB (#115D)	Observation Well
100-00453	37 57 31.00	75 27 02.00	170	Greenbriar Development Co.	Observation Well
100-00455	37 56 17.00	75 27 37.00	280	SWCB (#115E)	Observation Well
100-00462	37 54 03.00	75 30 25.20	69	Atlantic Fire House	Public Institution
100-00463	37 53 32.20	75 32 60.00	240	Colonial Strippen	Domestic
100-00464	37 55 46.00	75 30 07.00	145	Dallie Cropper	Domestic
100-00471	37 56 25.00	75 29 45.00	215	Robert Phillips	Domestic
100-00490	37 56 13.00	75 29 56.00	180	Charles F. Keller	Domestic
100-00491	37 56 13.00	75 29 56.00	190	William Watson	Domestic
100-00492	37 56 22.00	75 30 43.00	160	Ida Louise Guy	Domestic

* SWCB - State Water Control Board
Source: References 13, 14.

TABLE 3A-1 (CONTINUED)

100-00493	37 55 50.00	75 27 54.00	107	Town of Chincoteague (#7A)	Public Water Supply
100-00494	37 55 57.00	75 27 49.00	106	Town of Chincoteague (#7B)	Public Water Supply
100-00495	37 56 04.00	75 27 42.00	100	Town of Chincoteague (#7C)	Public Water (Not in use)
100-00496	37 54 14.00	75 30 18.00	125	Orville Burton	Domestic
100-00510	37 53 37.00	75 30 32.00	125	Sherwood Tull	Domestic
100-00511	37 54 17.00	75 30 33.00	115	James Stokes	Domestic
100-00512	37 56 07.00	75 29 55.00	186	Eric Hansen	Domestic
100-00515	37 55 53.00	75 29 45.00	160	Esther Huyett	Domestic
100-00540	37 52 28.00	75 32 24.00	155	William Furman	Domestic
100-00543	37 56 18.00	75 30 24.00	190	Cathy Killmon	Domestic
100-00552	37 56 24.00	75 29 52.00	187	Jeffery Snead	Other
100-00553	37 56 05.00	75 29 26.00	188	Lance J. Eller, Inc.	Domestic
100-00560	37 52 40.00	75 32 18.00	170	Martin Birch	Domestic
100-00571	37 54 03.00	75 30 26.00	130	George Bickel	Domestic
100-00572	37 52 42.00	75 32 39.00	180	William Birch	Domestic
100-00575	37 55 41.00	75 32 59.00	168	John Gordy, USGS	Commercial
100-00577	37 55 42.00	75 29 32.00	180	Howard Parmer	Domestic
100-00586	37 56 05.00	75 30 05.00	150	Don Altemeyer	Domestic
100-00595	37 55 34.00	75 29 18.00	150	William Wessells	Domestic
100-00596	37 52 42.00	75 29 39.00	170	Richard Conklin	Domestic
100-00598	37 54 03.00	75 30 30.00	130	George White	Domestic
100-00606	37 52 22.00	75 32 11.00	175	Mike Justice	Domestic
100-00608	37 52 31.00	75 31 55.00	175	Carlton Bowden	Domestic
100-00611	37 55 55.00	75 30 12.00	190	Irene Parks	Domestic
100-00696	37 56 19.00	75 30 03.00	215	Gene W. Taylor	Domestic
100-00697	37 56 10.00	75 30 00.00	215	Gene Taylor	Domestic
100-00698	37 56 14.00	75 29 51.00	180	Robert Lappin	Domestic
100-00699	37 56 13.00	75 29 52.00	180	Robert Lappin	Domestic
100-00700	37 55 26.00	75 29 28.00	135	Glenn Bass	Domestic
100-00701	37 55 48.00	75 29 45.00	125	Craig Purdy	Domestic
100-00702	37 56 27.00	75 30 14.00	180	Walter Carpenter	Domestic

* SWCB - State Water Control Board

Source: References 13, 14.

TABLE 3A-1 (CONTINUED)

100-00703	37 56 00.00	75 30 25.00	190	Irene Parks	Domestic
100-00704	37 56 22.00	75 30 18.00	190	Harold Lancaster	Domestic
100-00705	37 54 20.00	75 30 38.00	195	Lawrence B. Davis	Domestic
100-00706	37 54 13.00	75 30 16.00	200	Lawrence B. Davis	Domestic
100-00707	37 54 14.00	75 30 16.00	125	Royce Jones	Domestic
100-00708	37 54 28.00	75 31 02.00	195	Lawrence B. Davis	Domestic
100-00709	37 54 25.00	75 31 10.00	205	Thomas L. Hart, Jr.	Domestic
100-00710	37 53 17.00	75 30 22.00	145	Corbin Drummond	Domestic
100-00711	37 54 23.00	75 31 38.00	145	Accomack County	Other
100-00712	37 52 39.00	75 32 00.00	215	Paul Lewis	Domestic
100-00715	37 56 08.00	75 32 53.00	175	J. Dennis Fox	Domestic
100-00716	37 55 48.00	75 33 02.00	168	John Gordy, Inc.	Public Water Supply
100-00719	37 58 58.00	75 31 52.00	190	Ruth Nelson	Domestic
100-00771	37 55 24.00	75 29 07.00	210	Anthony St. George	Domestic
100-00772	37 55 43.00	75 29 24.00	190	Denver Mears, Jr.	Domestic
100-00773	37 55 39.00	75 29 09.00	190	Gregory Merritt	Domestic
100-00774	37 55 59.00	75 29 36.00	185	John D. Schroer	Domestic
100-00775	37 56 11.00	75 29 54.00	215	Barbara Conaway	Domestic
100-00776	37 56 36.00	75 29 37.00	185	Kenneth Bunting	Domestic
100-00778	37 56 36.00	75 30 00.00	190	Joseph Rutkowski	Domestic
100-00779	37 56 17.00	75 30 00.00	190	Rodman Tarr	Domestic
100-00780	37 56 13.00	75 30 01.00	190	Eddie A. Gray	Domestic
100-00781	37 52 43.00	75 32 08.00	218	Frank Lafferty	Domestic
100-00783	37 55 47.00	75 30 16.00	180	Carlton Snow	Domestic
100-00788	37 57 23.00	75 31 54.00	215	Stewart Hall, Jr.	Domestic
100-00801	-	-	-	NASA (B-49)	Not in use
100-00802	37 56 24.00	75 28 37.00	-	NASA (D-40)	Public Water Supply
100-00803	37 57 31.00	75 26 51.00	70	Greenbriar Development Co.	Other
100-00804	37 57 41.00	75 27 34.00	170	Greenbriar Development Co.	-
100-00805	37 57 43.00	75 27 33.00	65	Greenbriar Development Co.	Observation Well
100-00809	37 56 42.00	75 27 15.00	227	Town of Chincoteague	Test Well

* SWCB - State Water Control Board
Source: References 13, 14.

TABLE 3A-1 (CONTINUED)

100-00813	37 52 39.00	75 31 57.00	170	Carlton Bowden	Domestic
100-00815	37 54 39.00	75 31 13.00	-	Chris/Karen Hoffman	Domestic
100-00830	37 55 43.00	75 29 26.00	195	Gene Wayne Taylor	Domestic
100-00831	37 55 48.00	75 29 54.00	175	Eddie Tull	Domestic
100-00832	37 52 44.00	75 29 57.00	175	Thomas W. Taylor	Domestic
100-00834	37 56 12.00	75 30 34.00	205	Doug Estes	Domestic
100-00836	37 56 28.00	75 29 59.00	210	Joe/Donna Hilton	Domestic
100-00840	37 55 34.00	75 29 55.00	170	Edward T. Tull	Domestic
-	37 56 26.00	75 27 25.00	55	Town of Chincoteague (#3A)	Public Water Supply
-	37 56 26.00	75 27 25.00	60	Town of Chincoteague (#3B)	Public Water Supply
-	37 56 26.00	75 27 25.00	60	Town of Chincoteague (#3C)	Public Water Supply
-	-	-	245	NASA Visitors Info. Center (J-20)	Public Water Supply
PWS-1010	37 56 15.00	75 30 49.00	-	Ray's Shanty	Public Water Supply
PWS-1053	37 56 45.00	75 22 30.00	-	Tom's Country Chicken	Public Water Supply
PWS-1207	37 56 59.00	75 32 46.00	-	Decoy Factory	Public Water Supply
PWS-1225	37 57 00.00	75 32 25.00	-	Edgewood Trailer Park	Public Water Supply
PWS-1680	37 57 02.00	75 32 31.00	-	J.P. Cutler (Peace Token)	Public Water Supply
PWS-1715	37 56 47.00	75 32 25.00	-	Pizza Hut	Public Water Supply
PWS-1787	37 55 52.00	75 32 50.00	-	Sharoak Forest Trailer Park	Public Water Supply
PWS-1857	37 54 12.00	75 30 20.00	-	Wolff Sandwich Shoppe	Public Water Supply
PWS-1885	37 56 42.00	75 32 27.00	-	T.E. Mears (T's Corner)	Public Water Supply
PWS-1980	37 54 30.00	75 28 32.00	-	Lewis Wright (Wright's Seafood Restaurant)	Public Water Supply

* SWCB - State Water Control Board

Source: References 13, 14.

The data provided by the SWCB may not be a complete inventory of all wells within a 4-mile radius as the Commonwealth of Virginia did not have a requirement for permitting or registering wells prior to 1982 (References 13, 15), and reporting of water withdrawals is limited to users withdrawing more than 10,000 gallons per day (Reference 16). In addition, registration prior to September 1990 was required only for wells installed in conjunction with sewage treatment systems (Reference 15).

3B. Outline the public water distribution system within a 4-mile radius of each source on a topographic map.

The public water distribution systems are outlined on Figure 3B-1, Public Water Distribution System, located in Appendix A.

Domestic water for the WFF Main Base is supplied by seven active on-site drinking water wells. The wells are connected to a single supply system which serves the Main Base, the Coast Guard Complex, Army Reserve Facility, Marine Sciences Consortium, and the Navy housing area. The water is pumped to a 500,000-gallon storage tank, followed by chlorination treatment and storage in a 100,000-gallon elevated storage tank. The domestic water distribution system for the Main Base is shown in Figure 3B-2 in Appendix A (Reference 7). The NASA Visitor Information Center located across Route 175 to the east of the Main Base receives potable water from NASA well J-20, installed in 1991.

Potable water for the Wallops Mainland and Wallops Island is supplied by two deep wells located on the Mainland. Neither of the wells is within a 4-mile radius of the source areas located on the Main Base.

The majority of residents in rural areas on Virginia's Eastern Shore obtain potable water from private domestic wells. Only seven towns on the Eastern Shore have central public supply systems. Of those seven, only Chincoteague draws its water supply from the area within a 4-mile radius of the WFF and the identified source areas. The Chincoteague system supplies

one industrial user, and services an estimated 1850 residential and 500 commercial and institutional connections (Reference 17).

The water supply for Chincoteague is obtained from a series of deep wells and three shallow wells located on the WFF. The groundwater is pretreated with soda ash and chlorinated on the mainland before being pumped to the water treatment plant located on Chincoteague Island. Following treatment, the potable water is stored in a 1 million-gallon ground-level storage tank and a 200,000-gallon elevated tank. The potable water supply is distributed through approximately 25 miles of water lines. The Chincoteague system services all of Chincoteague Island and the lighthouse complex at the Assateague Refuge. (Reference 17.)

The identification of other public water supply wells indicated on Figure 3B-1 was provided by the Virginia Department of Health (Reference 14).

3C. Identify the nearest drinking-water well within a 4-mile radius of each source.

The nearest drinking water wells within a 4-mile radius of each source are all located within NASA's WFF boundaries. Each well is identified by the SWCB identification number and by the owner's designation. Well locations are shown on Figure 3A-1 in Appendix A.

Source Area	SWCB Well I.D.	Owner I.D.
Fire Training Area	100-802	NASA D-40
Waste Oil Dump	100-204	NASA D-39
Aviation Fuel Tank Farm	100-494	Town of Chincoteague TOC-7B
Scrapyard/PCB Transformer	100-203	NASA F-35

3D. Determine the population (including workers, students, and residents) drawing from each drinking-water well within the following radii. Each radius should start at the center of each source if the source is small, or at the outer edge if it is large. Count population in overlapping areas only once.

3D1. 0 - 1/4 mile

3D2. 1/4 - 1/2 mile

3D3. 1/2 - 1 mile

3D4. 1 - 2 miles

3D5. 2 - 3 miles

3D6. 3 - 4 miles

The wells and associated population served are listed in Tables 3D-1 through 3D-4.

TABLE 3D-1. ESTIMATED POPULATION SERVED BY DRINKING WATER WELLS WITHIN A 4-MILE RADIUS OF THE FIRE TRAINING AREA

Radius	SWCB*-ID	Owner	Usage	Estimated Population Served
0-1/4 Mile	None			0
1/4-1/2 Mile	100-00198	NASA (F-113)	Public Water Supply	200
	100-00200	NASA (F-31)	Public Water Supply	200
	100-00203	NASA (F-35)	Public Water Supply	200
	100-00204	NASA (D-39)	Public Water Supply	200
	100-00208	NASA (H-115)	Public Water Supply	200
	100-00210	NASA (F-112)	Public Water Supply	200
	100-00802	NASA (D-40)	Public Water Supply	200
1/2-1 Mile	100-00017	NASA (NOAA)	Public Water Supply	96
	100-00032	Town of Chincoteague (#5)	Public Water Supply	0(1500)
	100-00494	Town of Chincoteague (#7B)	Public Water Supply	510(1500)
	-	Town of Chincoteague (#3B)	Public Water Supply	510(1500)
	-	Town of Chincoteague (#3C)	Public Water Supply	510(1500)
1-2 Miles	100-00028	Town of Chincoteague (#4)	Public Water Supply	510(1500)
	100-00320	Town of Chincoteague (#6)	Public Water Supply	510(1500)
	100-00378	Phillip Hickman	Domestic	3
	100-00464	Dallie Cropper	Domestic	3
	100-00471	Robert Phillips	Domestic	3
	100-00490	Charles F. Keller	Domestic	3
	100-00491	William Watson	Domestic	3
	-	Town of Chincoteague (#3A)	Public Water Supply	510(1500)
	100-00493	Town of Chincoteague (#7A)	Public Water Supply	510(1500)
	100-00512	Eric Hansen	Domestic	3
	100-00515	Esther Huyett	Domestic	3
	100-00543	Cathy Killmon	Domestic	3
	100-00552	Jeffery Snead	Domestic	3
	100-00577	Howard Parmer	Domestic	3
	100-00595	William Wessells	Domestic	3
	100-00611	Irene Parks	Domestic	3
	100-00696	Gene W. Taylor	Domestic	3
	100-00697	Gene Taylor	Domestic	3

* SWCB - State Water Control Board
PWS - Public Water Supply System

TABLE 3D-1. (CONTINUED)

Radius	SWCB*-ID	Owner	Usage	Estimated Population Served
1-2 Miles (continued)	100-00698	Robert Lappin	Domestic	3
	100-00699	Robert Lappin	Domestic	3
	100-00700	Glenn Bass	Domestic	3
	100-00701	Craig Purdy	Domestic	3
	100-00702	Walter Carpenter	Domestic	3
	100-00703	Irene Parks	Domestic	3
	100-00704	Harold Lancaster	Domestic	3
	100-00771	Anthony St. George	Domestic	3
	100-00772	Denver Mears, Jr.	Domestic	3
	100-00773	Gregory Merritt	Domestic	3
	100-00774	John D. Schroer	Domestic	3
	100-00775	Barbara Conaway	Domestic	3
	100-00776	Kenneth Bunting	Domestic	3
	100-00778	Joseph Rutkowski	Domestic	3
	100-00779	Rodman Tarr	Domestic	3
	100-00780	Eddie A. Gray	Domestic	3
	100-00783	Carlton Snow	Domestic	3
	100-00830	Gene W. Taylor	Domestic	3
	100-00831	Eddie Tull	Domestic	3
	100-00834	Doug Estes	Domestic	3
	100-00836	Joe/Donna Hilton	Domestic	3
	-	NASA Visitor Information Center (J-20)	Public Water	-
2-3 Miles	100-00492	Ida Louise Guy	Domestic	3
	PWS-1010	Ray's Shanty	Public Water Supply	100
	PWS-1980	Lewis Wright	Public Water Supply	400
3-4 Miles	100-00234	Richard Thornton, Jr.	Domestic	3
	100-00496	Orville Burton	Domestic	3
	100-00510	Sherwood Tull	Domestic	3
	100-00511	James Stokes	Domestic	3
	100-00571	George Bickel	Domestic	3
	100-00598	George White	Domestic	3
	100-00705	Lawrence B. Davis	Domestic	3
	100-00706	Lawrence B. Davis	Domestic	3
	100-00707	Royce Jones	Domestic	3
	100-00708	Lawrence B. Davis	Domestic	3
	100-00709	Thomas L. Hart, Jr.	Domestic	3

* SWCB - State Water Control Board
PWS - Public Water Supply System

TABLE 3D-1. (CONTINUED)

Radius	SWCB*-ID	Owner	Usage	Estimated Population Served
3-4 Miles (continued)	100-00788	Stewart Hall, Jr.	Domestic	3
	100-00815	Chris/Karen Hoffman	Domestic	3
	PWS-1053	Tom's County Chicken	Public Water Supply	200
	PWS-1207	Decoy Factory	Public Water Supply	30
	PWS-1225	Edgewood Trailer Park	Public Water Supply	55
	PWS-1680	J.P. Cutler (Peace Token)	Public Water Supply	250
	PWS-1715	Pizza Hut	Public Water Supply	350
	PWS-1787	Sharoak Forest Trailer Park	Public Water Supply	19
	PWS-1857	Wolff Sandwich Shoppe	Public Water Supply	100
	PWS-1885	T.E. Mears (T's Corner)	Public Water Supply	175

* SWCB - State Water Control Board
PWS - Public Water Supply System

TABLE 3D-2. ESTIMATED POPULATION SERVED BY DRINKING WATER WELLS WITHIN A 4-MILE RADIUS OF THE WASTE OIL DUMP

Radius	SWCB*-ID	Owner	Usage	Estimated Population Served
0-1/4 Mile	None			0
1/4-1/2 Mile	100-00017	NASA (NOAA)	Public Water Supply	96
	100-00204	NASA (D-39)	Public Water Supply	200
1/2-1 Mile	100-00028	Town of Chincoteague (#4)	Public Water Supply	510(1500)
	100-00032	Town of Chincoteague (#5)	Public Water Supply	0(1500)
	100-00198	NASA (F-113)	Public Water Supply	200
	100-00200	NASA (F-31)	Public Water Supply	200
	100-00203	NASA (F-35)	Public Water Supply	200
	100-00208	NASA (H-115)	Public Water Supply	200
	100-00210	NASA (F-112)	Public Water Supply	200
	100-00320	Town of Chincoteague (#6)	Public Water Supply	510(1500)
	100-00802	NASA (D-40)	Public Water Supply	200
	-	Town of Chincoteague (#3A)	Public Water Supply	510(1500)
	-	Town of Chincoteague (#3B)	Public Water Supply	510(1500)
	-	Town of Chincoteague (#3C)	Public Water Supply	510(1500)
	-	NASA Visitor Information Center (J-20)	Public Water Supply	-
1-2 Miles	100-00378	Phillip Hickman	Domestic	3
	100-00471	Robert Phillips	Domestic	3
	100-00490	Charles F. Keller	Domestic	3
	100-00491	William Watson	Domestic	3
	100-00493	Town of Chincoteague (#7A)	Public Water Supply	510(1500)
	100-00494	Town of Chincoteague (#7B)	Public Water Supply	510(1500)
	100-00512	Eric Hansen	Domestic	3
	100-00515	Esther Huyett	Domestic	3
	100-00552	Jeffery Snead	Domestic	3
	100-00577	Howard Parmer	Domestic	3
	100-00586	Don Altemeyer	Domestic	3
	100-00595	William Wessells	Domestic	3
	100-00696	Gene W. Taylor	Domestic	3
	100-00697	Gene Taylor	Domestic	3
	100-00698	Robert Lappin	Domestic	3
	100-00699	Robert Lappin	Domestic	3
	100-00701	Craig Purdy	Domestic	3
	100-00702	Walter Carpenter	Domestic	3

* SWCB - State Water Control Board
PWS - Public Water Supply System

TABLE 3D-2. (CONTINUED)

Radius	SWCB*-ID	Owner	Usage	Estimated Population Served
1-2 Miles (continued)	100-00771	Anthony St. George	Domestic	3
	100-00772	Denver Mears, Jr.	Domestic	3
	100-00773	Gregory Merritt	Domestic	3
	100-00774	John D. Schroer	Domestic	3
	100-00775	Barbara Conaway	Domestic	3
	100-00776	Kenneth Bunting	Domestic	3
	100-00778	Joseph Rutkowski	Domestic	3
	100-00779	Rodman Tarr	Domestic	3
	100-00780	Eddie A. Gray	Domestic	3
	100-00830	Gene W. Taylor	Domestic	3
	100-00836	Joe/Donna Hilton	Domestic	3
2-3 Miles	100-00464	Dallie Cropper	Domestic	3
	100-00492	Ida Louise Guy	Domestic	3
	100-00543	Cathy Killmon	Domestic	3
	100-00611	Irene Parks	Domestic	3
	100-00700	Glenn Bass	Domestic	3
	100-00703	Irene Parks	Domestic	3
	100-00704	Harold Lancaster	Domestic	3
	100-00783	Carlton Snow	Domestic	3
	100-00831	Eddie Tull	Domestic	3
	100-00834	Doug Estes	Domestic	3
	100-00840	Edward T. Tull	Domestic	3
	PWS-1010	Ray's Shanty	Public Water Supply	100
	PWS-1980	Lewis Wright	Public Water Supply	400
3-4 Miles	100-00234	Richard Thornton, Jr.	Domestic	3
	100-00496	Orville Burton	Domestic	3
	100-00511	James Stokes	Domestic	3
	100-00571	George Bickel	Domestic	3
	100-00598	George White	Domestic	3
	100-00705	Lawrence B. Davis	Domestic	3
	100-00706	Lawrence B. Davis	Domestic	3
	100-00707	Royce Jones	Domestic	3
	100-00708	Lawrence B. Davis	Domestic	3
	100-00788	Stewart Hall, Jr.	Domestic	3

* SWCB - State Water Control Board
PWS - Public Water Supply System

TABLE 3D-2. (CONTINUED)

Radius	SWCB*-ID	Owner	Usage	Estimated Population Served
3-4 Miles (continued)	100-00815	Chris/Karen Hoffman	Domestic	3
	PWS-1207	Decoy Factory	Public Water Supply	30
	PWS-1680	J.P. Cutler (Peace Token)	Public Water Supply	250
	PWS-1715	Pizza Hut	Public Water Supply	350
	PWS-1857	Wolff Sandwich Shoppe	Public Water Supply	100

* SWCB - State Water Control Board
PWS - Public Water Supply System

TABLE 3D-3. ESTIMATED POPULATION SERVED BY DRINKING WATER WELLS WITHIN A 4-MILE RADIUS OF THE AVIATION FUEL TANK FARM

Radius	SWCB*-ID	Owner	Usage	Estimated Population Served
0-1/4 Mile	None			0
1/4-1/2 Mile	-	Town of Chincoteague (#3B)	Public Water Supply	510(1500)
	-	Town of Chincoteague (#3C)	Public Water Supply	510(1500)
	100-00204	NASA (D-39)	Public Water Supply	200
	100-00494	Town of Chincoteague (#7B)	Public Water Supply	510(1500)
1/2-1 Mile	-	Town of Chincoteague (#3A)	Public Water Supply	510(1500)
	100-00017	NASA (NOAA)	Public Water Supply	96
	100-00028	Town of Chincoteague (#4)	Public Water Supply	510(1500)
	100-00032	Town of Chincoteague (#5)	Public Water Supply	0(1500)
	100-00198	NASA (F-113)	Public Water Supply	200
	100-00200	NASA (F-31)	Public Water Supply	200
	100-00208	NASA (H-115)	Public Water Supply	200
	100-00210	NASA (F-112)	Public Water Supply	200
	100-00320	Town of Chincoteague (#6)	Public Water Supply	510(1500)
	100-00493	Town of Chincoteague (#7A)	Public Water Supply	510(1500)
	100-00802	NASA (D-40)	Public Water Supply	200
	-	NASA Visitor Information Center (J-20)	Public Water Supply	-
1-2 Miles	100-00378	Phillip Hickman	Domestic	3
	100-00471	Robert Phillips	Domestic	3
	100-00490	Charles F. Keller	Domestic	3
	100-00491	William Watson	Domestic	3
	100-00512	Eric Hansen	Domestic	3
	100-00515	Esther Huyett	Domestic	3
	100-00552	Jeffery Snead	Domestic	3
	100-00577	Howard Parmer	Domestic	3
	100-00586	Don Altemeyer	Domestic	3
	100-00595	William Wessells	Domestic	3
	100-00696	Gene W. Taylor	Domestic	3
	100-00697	Gene Taylor	Domestic	3
	100-00698	Robert Lappin	Domestic	3
	100-00699	Robert Lappin	Domestic	3
	100-00700	Glenn Bass	Domestic	3
	100-00701	Craig Purdy	Domestic	3

* SWCB - State Water Control Board
PWS - Public Water Supply System

TABLE 3D-3. (CONTINUED)

Radius	SWCB*-ID	Owner	Usage	Estimated Population Served
1-2 Miles (continued)	100-00771	Anthony St. George	Domestic	3
	100-00772	Denver Mears, Jr.	Domestic	3
	100-00773	Gregory Merritt	Domestic	3
	100-00774	John D. Schroer	Domestic	3
	100-00775	Barbara Conaway	Domestic	3
	100-00776	Kenneth Bunting	Domestic	3
	100-00778	Joseph Rutkowski	Domestic	3
	100-00779	Rodman Tarr	Domestic	3
	100-00780	Eddie A. Gray	Domestic	3
	100-00830	Gene W. Taylor	Domestic	3
	100-00831	Eddie Tull	Domestic	3
	100-00836	Joe/Donna Hilton	Domestic	3
2-3 Miles	100-00464	Dallie Cropper	Domestic	3
	100-00492	Ida Louise Guy	Domestic	3
	100-00543	Cathy Killmon	Domestic	3
	100-00611	Irene Parks	Domestic	3
	100-00702	William Carpenter	Domestic	3
	100-00703	Irene Parks	Domestic	3
	100-00704	Harold Lancaster	Domestic	3
	100-00834	Doug Estes	Domestic	3
	100-00840	Edward T. Tull	Domestic	3
	PWS-1010	Ray's Shanty	Public Water Supply	100
	PWS-1980	Lewis Wright	Public Water Supply	400
3-4 Miles	100-00234	Richard Thornton, Jr.	Domestic	3
	100-00496	Orville Burton	Domestic	3
	100-00705	Lawrence B. Davis	Domestic	3
	100-00707	Royce Jones	Domestic	3
	100-00708	Lawrence B. Davis	Domestic	3
	100-00709	Thomas L. Hart, Jr.	Domestic	3
	100-00788	Stewart Hall, Jr.	Domestic	3
	100-00815	Chris/Karen Hoffman	Domestic	3
	PWS-1857	Wolff Sandwich Shoppe	Public Water Supply	100

* SWCB - State Water Control Board
PWS - Public Water Supply System

TABLE 3D-4. ESTIMATED POPULATION SERVED BY DRINKING WATER WELLS WITHIN A 4-MILE RADIUS OF THE SCRAPYARD/PCB TRANSFORMER SOURCES

Radius	SWCB*-ID	Owner	Usage	Estimated Population Served
0-1/4 Mile	None			0
1/4-1/2 Mile	100-00200	NASA (F-31)	Public Water Supply	200
	100-00203	NASA (F-35)	Public Water Supply	200
	100-00208	NASA (H-115)	Public Water Supply	200
	100-00773	Gregory Merritt	Domestic	3
1/2-1 Mile	100-00198	NASA (F-113)	Public Water Supply	200
	100-00210	NASA (F-112)	Public Water Supply	200
	100-00493	Town of Chincoteague (#7A)	Public Water Supply	510(1500)
	100-00494	Town of Chincoteague (#7B)	Public Water Supply	510(1500)
	100-00515	Esther Huyett	Domestic	3
	100-00577	Howard Parmer	Domestic	3
	100-00595	William Wessells	Domestic	3
	100-00700	Glenn Bass	Domestic	3
	100-00701	Craig Purdy	Domestic	3
	100-00771	Anthony St. George	Domestic	3
	100-00772	Denver Mears, Jr.	Domestic	3
	100-00802	NASA (D-40)	Public Water Supply	200
	100-00830	Gene W. Taylor	Domestic	3
1-2 Miles	100-00017	NASA (NOAA)	Public Water Supply	96
	100-00028	Town of Chincoteague (#4)	Public Water Supply	510(1500)
	100-00032	Town of Chincoteague (#5)	Public Water Supply	0(1500)
	100-00320	Town of Chincoteague (#6)	Public Water Supply	510(1500)
	100-00464	Dallie Cropper	Domestic	3
	100-00471	Robert Phillips	Domestic	3
	100-00490	Charles F. Keller	Domestic	3
	100-00491	William Watson	Domestic	3
	100-00492	Ida Louise Guy	Domestic	3
	100-00512	Eric Hansen	Domestic	3
	100-00543	Cathy Killmon	Domestic	3
	100-00552	Jeffery Snead	Domestic	3
	100-00586	Don Altemeyer	Domestic	3

* SWCB - State Water Control Board
PWS - Public Water Supply System

TABLE 3D-4. (CONTINUED)

Radius	SWCB*-ID	Owner	Usage	Estimated Population Served
1-2 Miles (continued)	100-00611	Irene Parks	Domestic	3
	100-00696	Gene W. Taylor	Domestic	3
	100-00697	Gene Taylor	Domestic	3
	100-00698	Robert Lappin	Domestic	3
	100-00699	Robert Lappin	Domestic	3
	100-00702	Walter Carpenter	Domestic	3
	100-00704	Harold Lancaster	Domestic	3
	100-00775	Barbara Conaway	Domestic	3
	100-00776	Kenneth Bunting	Domestic	3
	100-00778	Joseph Rutkowski	Domestic	3
	100-00779	Rodman Tarr	Domestic	3
	100-00780	Eddie A. Gray	Domestic	3
	100-00783	Carlton Snow	Domestic	3
	100-00831	Eddie Tull	Domestic	3
	100-00834	Doug Estes	Domestic	3
	100-00836	Joe/Donna Hilton	Domestic	3
	100-00840	Edward T. Tull	Domestic	3
	-	Town of Chincoteague (#3A)	Public Water Supply	510(1500)
	-	Town of Chincoteague (#3B)	Public Water Supply	510(1500)
	-	Town of Chincoteague (#3C)	Public Water Supply	510(1500)
	-	NASA Visitor Information Center (J-20)	Public Water Supply	-
	PWS-1010	Ray's Shanty	Public Water Supply	100
2-3 Miles	100-00234	Richard Thornton, Jr.	Domestic	3
	100-00378	Phillip Hickman	Domestic	3
	100-00496	Orville Burton	Domestic	3
	100-00511	James Stokes	Domestic	3
	100-00571	George Bickel	Domestic	3
	100-00598	George White	Domestic	3
	100-00705	Lawrence B. Davis	Domestic	3
	100-00706	Lawrence B. Davis	Domestic	3
	100-00707	Royce Jones	Domestic	3
	100-00708	Lawrence B. Davis	Domestic	3
	100-00709	Thomas L. Hart, Jr.	Domestic	3
	100-00815	Chris/Karen Hoffman	Domestic	3
	PWS-1857	Wolff Sandwich Shoppe	Public Water Supply	100

* SWCB - State Water Control Board
PWS - Public Water Supply System

TABLE 3D-4. (CONTINUED)

Radius	SWCB*-ID	Owner	Usage	Estimated Population Served
3-4 Miles	100-00264	Page Fisher	Domestic	3
	100-00308	Hastings Trucking Co.	Domestic	3
	100-00375	Arcadia High School	Public Water Supply	600
	100-00510	Sherwood Tull	Domestic	3
	100-00596	Richard Conklin	Domestic	3
	100-00710	Corbin Drummond	Domestic	3
	100-00715	J. Dennis Fox	Domestic	3
	100-00788	Stewart Hall, Jr.	Domestic	3
	100-00832	Thomas W. Taylor	Domestic	3
	PWS-1053	Tom's Country Chicken	Public Water Supply	200
	PWS-1207	Decoy Factory	Public Water Supply	30
	PWS-1225	Edgewood Trailer Park	Public Water Supply	55
	PWS-1680	J.P. Cutler (Peace Token)	Public Water Supply	250
	PWS-1715	Pizza Hut	Public Water Supply	350
	PWS-1787	Sharoak Forest Trailer Park	Public Water Supply	19
	PWS-1885	T.E. Mears (T's Corner)	Public Water Supply	175

* SWCB - State Water Control Board
PWS - Public Water Supply System

Methods for estimating population served by drinking water wells are defined in 55 FR 241 (Reference 2). For estimating residential population for domestic wells, each residence is multiplied by the average number of persons per residence for the county in which the residence is located. An average number of three persons per non-town residence was estimated from 1990 Census and Housing Unit data for Accomack County (Table 1E-1). This average was used as the population served by each domestic well listed in Tables 3D-1 through 3D-4.

In determining the population served by a well which is part of a multi-well supply system, 55 FR 241 indicates that all wells should be assumed to contribute equally, and the total population served should be divided by the number of wells. The exception to this rule is for a system which receives more than 40 percent of the average annual pumpage from any one well. For that situation, population served must be determined for each well in the system based on relative contribution to the average annual pumpage (Reference 2).

Based on 1990 pumpage data for the Town of Chincoteague (TOC) wells (Reference 17), the maximum percentage contributed by any one well is 28 percent. However, given the large influx of summer residents and visitors, the population served by TOC wells was computed separately for the summer months of June through September. That number is presented in parenthesis in Tables 3D-1 through 3D-4, following the population estimate for the non-summer months (January through May and October through December). Since no single TOC well contributed more than 40 percent during either the summer or non-summer periods for 1990, all wells were assumed to contribute equally in accordance with 55 FR 241, with the exception of well TOC-5 which in 1990 was used only for the summer months. Total TOC population for non-summer months is 3,572 (Reference 4) served by seven wells. TOC population for summer months was estimated to be 12,000 served by eight wells.

Population served by NASA wells includes NASA employees (Reference 18), and Navy employees and on-base residents (References 6, 19).

3E. Describe known or probable groundwater flow direction from each source.

The EPA has indicated on the deficiency checklist that this discussion, provided in the PA/SI Reports, is acceptable. No further discussion is required.

3F. Describe as specifically as possible the geology and hydrogeology of the facility area (including geological formation name, thickness, types of material, hydraulic conductivities, and depth to aquifers); provide references.

The EPA has indicated on the deficiency checklist that this discussion, provided in the PA/SI Reports, is acceptable. No further discussion is required.

3G. Discuss any evidence of aquitards and discontinuities between aquifers within a 4-mile radius of each source.

The EPA has indicated on the deficiency checklist that this discussion, provided in the PA/SI Reports, is acceptable. No further discussion is required.

3H. Describe any evidence of interconnections between the uppermost aquifer and lower aquifers within 2 miles of each source.

The EPA has indicated on the deficiency checklist that this discussion, provided in the PA/SI Reports, is acceptable. No further discussion is required.

3I. Estimate annual net precipitation at the facility.

The annual net precipitation at WFF is 14.2 inches. This value was derived from actual mean monthly temperature and precipitation data provided by NASA (Reference 20), and calculated monthly potential evaporation (E_i) data. The method for calculating the E_i values was taken from 55 FR 241 (Reference 2). The calculations are included in Appendix B.

From Figure 3-2, Net Precipitation Factor Values, in 55 FR 241 the net precipitation factor value for the WFF area is 6, which corresponds to a net precipitation range of greater than 15

to 30 inches (Table 3-4, 55 FR 241). The calculated net precipitation of 14.2 inches corresponds to a net precipitation factor value of 3 for a range of greater than 5 to 15 inches of net precipitation.

3J. Discuss soil or geologic conditions that might inhibit or facilitate groundwater migration.

The EPA has indicated on the deficiency checklist that this information, provided in the PA/SI Reports, is acceptable. No further discussion is required.

3K. Determine if sources are located in an area of Karst terrain.

The EPA has indicated on the deficiency checklist that this information, provided in the PA/SI Reports, is acceptable. No further discussion is required.

3L. Provide results from groundwater sampling of aquifers underlying the sources and from domestic wells (drinking water) within 2 miles of each source.

The EPA has indicated on the deficiency checklist that this information, provided in the PA/SI Reports, is acceptable. No further discussion is required.

3M. Provide results from background groundwater sampling of aquifers underlying the sources.

The EPA has indicated on the deficiency checklist that this information, provided in the PA/SI Reports, is acceptable. No further discussion is required.

3N. Determine if any areas within a 4-mile radius of each source are located in a Wellhead Protection Area according to Section 1428 of the Safe Drinking Water Act.

The EPA has indicated on the deficiency checklist that this information, provided in the PA/SI Reports, is acceptable. No further discussion is required.

SECTION FOUR: SURFACE WATER PATHWAY INFORMATION

4A. Describe surface-water bodies 0 to 15 miles downstream of each source and provide a map of surface-water bodies receiving drainage from each source.

According to the EPA deficiency checklist, this information was provided in the PA/SI Reports, with the exception of a map. EPA requested a map of surface water bodies receiving drainage from each source.

As discussed in Item 2H of this report, the Scrapyard, PCB Transformer, and Fire Training Area source areas have no apparent point source discharges to surface waters. A USGS map is provided in Appendix A as Figure 4A-1, which indicates surface water bodies which may receive runoff from the Waste Oil Dump and the AFTF.

4B. Discuss the probable surface runoff pattern from each source to surface waters, including the distance to the nearest surface-water body; provide a map.

Figure 4A-1 in Appendix A indicates the probable surface runoff pattern from the Waste Oil Dump and the AFTF.

As discussed in detail in Item 2H, the Fire Training Area has no apparent point source discharge of surface water runoff to the WFF stormdrain system or surface waters. Runoff from the source area accumulates in the low-lying areas immediately downgradient. The nearest surface water body, Little Mosquito Creek, is approximately 0.5 mile distant from the Fire Training Area.

Surface runoff from the Waste Oil Dump area enters wetlands adjacent to Little Mosquito Creek via overland flow. The wetlands ultimately discharge to Little Mosquito Creek, which is approximately 0.25 mile distant from the Waste Oil Dump.

Surface runoff from the Aviation Fuel Tank Farm is discussed in detail in Item 2H. Any runoff collected by the WFF stormdrain system discharges to an unnamed tributary to Jenneys

Gut, which discharges to Mosquito Creek. Jenneys Gut is approximately 0.5 mile from the AFTF; flow distance including overland, stormdrain system, and the unnamed tributary, is approximately 0.8 mile. Jenneys Gut discharges to Mosquito Creek approximately 0.75 mile from the point of entry of the unnamed tributary.

As discussed in Item 2H, no stormdrains service the immediate area of the Scrapyard site, which is surrounded by a forested area. Surface runoff from the area accumulates in low-lying portions of the forested area to the east-southeast of the Scrapyard source area. No apparent discharge to surface waters occurs from that area. The nearest surface water body, Simoneaston Bay, is approximately 1 mile from the Scrapyard site.

Surface runoff from the PCB Transformer site enters a drainage ditch which eventually discharges to a grassed area with no apparent discharge to surface waters. The nearest surface water body, Little Simoneaston Creek, is approximately 0.75 mile from the PCB Transformer site.

4C. Describe the point(s) at each source where hazardous substances begin to migrate and their probable point(s) of entry into a surface-water body (including ponds, lakes, streams, etc.).

Fire Training Area: Migration of hazardous substances at the Fire Training Area would originate from the area identified by the 1990 Final Soil Gas Report (Reference 9). Hazardous substances migrating from the Fire Training Area have no known direct probable point source entry to surface waters; however, the contaminants may enter surface waters via groundwater/surface water interactions.

Waste Oil Dump: Based on analytical data presented in a previous NASA document (Reference 1) and the results of soil sampling conducted as part of this revision, no evidence of remaining contamination has been found at the Waste Oil Dump site. Therefore, migration of hazardous substances or their entry into surface waters is not expected to occur.

Aviation Fuel Tank Farm: Based on the results of sediment and surface water sampling conducted as part of this revision, migration of hazardous substances via surface water runoff does not appear to be occurring from the AFTF. The contaminants appear to be migrating via groundwater movement, and the probable point of entry to surface waters would result from groundwater/surface water interactions.

Scrapyard/PCB Transformer: Migration from the Scrapyard appears to have originated from within the fenced area. The estimated extent of contamination was defined by the 1990 Final Summary Report (Reference 1) and additional sediment sampling conducted as part of this Revision of Site Investigation Report. Migration from the PCB Transformer source area appears to have originated from the immediate vicinity of the former transformer location. Migration of the PCB contamination is limited to the soils in the area immediately surrounding the transformer pad, and extending to the nearby drainage ditch. The estimated extent of contamination was identified in the 1990 Final Summary Report (Reference 1).

As no direct discharge to surface waters occurs from either the Scrapyard or the PCB Transformer, and the PCB contamination is contained in shallow soil, the contaminants at these source areas have not been detected in any probable points of entry to surface waters.

4D. Identify if surface water drawn from intakes within 15 miles downstream of the probable point of entry is used for any of the following purposes:

4D1. Irrigation (5-acre minimum) of commercial food or commercial forage crops.

In the vicinity of WFF, most irrigation water is supplied from groundwater wells, although some farm ponds are used for crop irrigation. No surface water intakes for irrigation have been identified within the 15-mile downstream target distance (Reference 21).

4D2. Watering of commercial livestock.

The brackish nature of the surface waters, in addition to a lack of perennial flowing fresh water streams, makes the surface waters in the vicinity unsuitable for the watering of commercial livestock. Farm ponds which collect precipitation may be used for commercial livestock watering. No such targets have been identified within the target downstream distance (Reference 21).

4D3. Ingredient in commercial food preparation.

Due to their brackish nature, the surface waters in the vicinity of WFF are not considered acceptable sources of potable water and therefore would be unsuitable for use in commercial food preparation. No such targets have been identified within the 15-mile downstream target distance (Reference 22).

4D4. Major or designated water recreation area, excluding drinking water.

The Chincoteague National Wildlife Refuge is located within the boundaries of the Assateague Island National Seashore and extends out to Fishing Hook Point adjacent to Chincoteague Inlet. Fishing Point is south of Toms Cove and Little Toms Cove. A refuge impoundment, Pool F, receives saltwater supply from Toms Cove from July through September as part of the wildlife and habitat management program. (Reference 23.)

No other surface water intakes were identified within the downstream target distance.

4E. Identify the following targets associated with surface-water bodies 0 to 15 miles downstream of the probable point of entry:

4E1. Population (residents, workers, and students) served by intakes of drinking water.

Due to their brackish nature, surface waters in the vicinity of WFF are not considered acceptable sources of potable water. Therefore, the population served by intakes of drinking water is zero.

4E2. Sensitive environments (see Table 4-23, December 1990 Federal Register) and critical habitats for federally endangered or threatened species.

The Chincoteague National Wildlife Refuge extends out to Fishing Point adjacent to the Chincoteague Inlet. The southern portion of this area can be considered to be within the target downstream distance.

The southern and northern portions of Wallops Island have been proposed as critical habitat for piping plovers, a Federal Threatened Species. The southern portion of the island is closed to entry during the plover nesting season. (Reference 24.) Wallops Island is located southwest of the Chincoteague Inlet, along the Atlantic coastline. The habitat area is also utilized by Wilson's plovers, a State Endangered species, and gull-billed terns, a State Threatened species (Reference 25).

New Island, also known as Pelican Island, is a newly formed island located directly north of Wallops Island. New Island, which developed during 1989 and 1990, also has been proposed as critical habitat for piping plovers, and provides habitat for Wilson's plovers and gull-billed terns. (Reference 26.)

The inlet between Wallops Island and Assawoman Island closed in during the mid-1980s, making Assawoman an extension of Wallops Island (Reference 25).

Assawoman Island is included in the proposed designation as critical habitat for piping plovers (Reference 24).

A listing of threatened or endangered species found in the vicinity of WFF is presented in Table 4E2-1. The list is based on the Federal and State Endangered and Threatened Species in Virginia, which is a listing published by the Virginia Department of Game and Inland Fisheries (Reference 25).

Wallops Island is not designated as a unit of the Coastal Barrier Resources System; however, WFF must demonstrate consistency with the Coastal Primary Dunes Act as required by the Commonwealth of Virginia (Reference 27 and 28).

TABLE 4E2-1

STATUS OF THREATENED OR ENDANGERED SPECIES

IN THE VICINITY OF WALLOPS FLIGHT FACILITY

Scientific Name	Common Name	Status
Reptiles		
Caretta caretta	Loggerhead Sea Turtle	Federal Threatened
Chelonia mydas	Atlantic Green Sea Turtle	Federal Threatened
Dermochelys coriaces	Leatherback Sea Turtle	Federal Endangered
Eretmochelys imbricata	Hawksbill Sea Turtle	Federal Endangered
Lepidochelys kempi	Kemp's Ridley Sea Turtle	Federal Endangered
Birds		
Bartramia longicauda	Upland Sandpiper	State Threatened
Charadrius melodus	Piping Plover	Federal Threatened
Charadrius wilsonia	Wilson's Plover	State Endangered
Falco peregrinus	Peregrine Falcon	Federal Endangered
Haliaeetus leucocephalus	Bald Eagle	Federal Endangered
Sterna nilotica	Gull-billed tern	State Threatened
Marine Mammals		
Balaenoptera borealis	Sei Whale	Federal Endangered
Balaenoptera musculus	Blue Whale	Federal Endangered
Balaenoptera physalus	Fin Whale	Federal Endangered
Eubalaena glacialis	Northern Right Whale	Federal Endangered
Megaptera novaeangliae	Humpback Whale	Federal Endangered
Physeter catodon	Sperm Whale	Federal Endangered

Source: Virginia Department of Game and Inland Fisheries

4E3. Economically important resources (e.g., shellfish).

The habitat the surface water provides for shellfish and finfish is of primary importance since surface water in the vicinity of WFF is not considered an acceptable source of potable water. A variety of commercially important finfish species can be found in the tidal waters in the vicinity of WFF. These species include summer flounder, sea trout, northern kingfish, and menhaden. Commercially important shellfish include the American oyster, quahog clam, and blue crab (Reference 29). Areas not specifically closed to shellfish harvesting may be considered as active harvesting areas (References 30 and 31). Shellfish harvesting closure areas in the vicinity of WFF include all of Little Mosquito Creek and its tributaries, and areas adjacent to Chincoteague Island. The shellfish condemnation notices are included in Volume II (Reference 32).

4E4. Any portion of the surface water designated by a state for drinking-water use under Section 305(a) of the Clean Water Act; or any portion of surface water usable for drinking water.

As discussed in Section 4E1, the surface waters in the vicinity of WFF are not considered a source for potable water.

4F. Determine the miles of wetlands (wetland frontage) along surface-water bodies 0 to 15 miles downstream from the probable point of entry (see 40 CFR section 230.3).

The Fire Training Area, PCB Transformer, and Scrapyard source areas have no apparent point source discharges to surface waters, and, therefore, no probable points of entry.

Wetland frontages were determined from the probable point of entry from the Waste Oil Dump and the AFTF to the mouth of Chincoteague Inlet. The National Wetlands Inventory map provided by the U.S. Fish and Wildlife Service (Reference 33) was used to estimate wetland frontages.

No probable point of entry of contaminants from the Waste Oil Dump into surface waters was identified due to a lack of evidence of remaining contamination. However, from the approximate point of entry of surface water runoff from the Waste Oil Dump to the mouth of the Chincoteague Inlet (where Chincoteague Inlet discharges to the Atlantic Ocean), the total miles of wetlands is approximately 9.0.

The miles of wetland frontage from the approximate probable point of entry from the AFTF to the mouth of the Chincoteague Inlet is approximately 6.2.

4G. Provide results from sampling of wetlands and/or sensitive environments 0 to 15 miles downstream of each source.

Sampling efforts for this report were limited to:

(1) Sediment/shallow soil sampling at the Scrapyard and PCB Transformer sites to evaluate migration via surface water runoff. Since these areas have no apparent direct connection to surface waters or wetlands, no sampling of wetlands or sensitive environments within the target distance could be completed.

(2) Shallow soil sampling at the Fire Training Area to evaluate migration via surface water runoff. This area also has no apparent direct connection to surface waters or wetlands, and therefore, sampling of wetlands or sensitive environments within the target distance was not required.

(3) Soil sampling at various depths at the Waste Oil Dump site to determine whether soil contamination remained following the 1986 cleanup effort. Since no significant contamination was encountered during earlier investigations, additional sampling of wetlands and/or sensitive environments was not conducted in the vicinity of the Waste Oil Dump. The findings of earlier investigations are documented under Item 2I.

(4) Sediment and surface water sampling immediately downstream of the AFTF. The sampling effort was based on a two-phased approach at the AFTF site. The analytical results from samples collected immediately downstream of the AFTF, but upstream of

wetlands and sensitive environments, did not indicate that migration of contaminants from the AFTF is occurring via surface runoff. Therefore, the second phase, which would have addressed the other downstream targets, was deemed unnecessary and not conducted.

4H. Discuss any qualitative, quantitative, or circumstantial evidence of contamination of surface waters from sources.

Based on the limited sampling efforts completed to date and the runoff patterns discussed in Items 2H and 4B, no evidence has been found to date to indicate direct contamination of surface waters from these source areas.

4I. Provide results from sediment and surface-water sampling for points 0 to 15 miles downstream of each source.

As discussed in Item 4G, sampling completed as part of this Revision of Site Investigation Report was limited to sediment/shallow soil sampling at the Fire Training Area and Scrapyard/PCB Transformer source areas; soil sampling at the Waste Oil Dump; sampling of sediments and surface water immediately downgradient of the AFTF and soil sampling at the AFTF location; and background sediment and surface water samples.

The analytical results for the sampling effort are included in Appendix C. The Field Sampling and Analysis Plan, which identifies methodologies and sampling locations, is included in Volume II as a reference to this report.

Analyses of samples collected at the Scrapyard/PCB Transformer sites were limited to PCB analyses to evaluate migration due to surface runoff. One positive result for sample WFF7SY-SD3 was detected. The sample location is indicated on Figure 2I-4.

Levels above detection limits from analysis of sediment/shallow soil samples collected at the Fire Training Area were limited to metals and low-level pesticide detections. Those results are summarized in Table 4I-1.

TABLE 4I-1. ANALYTICAL RESULTS ABOVE DETECTION LIMITS FOR SEDIMENT SAMPLES COLLECTED AT THE FIRE TRAINING AREA.

ANALYTE	WFF7FT-SD-1	WFF7FT-SD2	WFF7FT-SD3	WFF7FT-SD4*
Metals	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Aluminum	1400	1100	2300	1600
Arsenic	ND	ND	0.54	ND
Barium	11	27	10	24
Cadmium	ND	2.5	1.3	1.6
Calcium	190	160	92	160
Chromium	ND	2.1	2.3	ND
Copper	ND	130	15	110
Iron	600	580	1600	510
Lead	ND	ND	9.1	ND
Magnesium	14	14	6.1	15
Manganese	22	27	17	37
Potassium	77	100	77	83
Silver	ND	2.6	ND	ND
Sodium	13	18	6.4	5.5
Vanadium	ND	ND	5.4	ND
Zinc	ND	150	5.9	82
Pesticides	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)
4,4'-DDE	ND	4.94	2.0	7.24
4,4'-DDT	ND	ND	ND	2.29

* WFF7FT-SD4 is a duplicate of WFF7FT-SD2.

ND - Not detected

Soil samples were collected at the Waste Oil Dump site for Total Petroleum Hydrocarbon (TPH) analyses. The results of the TPH analyses, which are included in Appendix C, did not indicate the presence of remaining contamination. Sample locations are indicated on Figure 2I-2.

Sampling at the AFTF included collection of soil samples from varying depths to evaluate remaining soil contamination following removal of the underground storage tanks (USTs) and associated piping; the collection of sediment samples from downgradient stormdrain inlets; and the collection of a downgradient sediment sample and two downgradient surface water samples. Sampling locations are indicated in the Field Sampling and Analysis Plan included in Volume II of this report (Reference 11). Analytical results above detection limits from these analyses are presented in Tables 4I-2 and 4I-3. The analytical results are included in Appendix C.

4J. Provide results from background sediment and surface-water sampling.

Background sediment and surface water samples were collected from Jenneys Gut upstream of the point of entry for runoff from the AFTF. The AFTF is the only source area with a probable point of direct entry of contaminants into surface waters. The analytical results from the background samples are presented in Appendix C of this report. Sample identification numbers are as follows:

WFF7BA-SD1 - Background sediment sample
WFF7BA-SW1 - Background surface water sample

Analytical results above detection limits, which were limited to metal detections, are summarized in Table 4J-1. Sample locations are identified in the Field Sampling and Analysis Plan in Volume II of this report (Reference 11).

TABLE 4I-2. ANALYTICAL RESULTS ABOVE DETECTION LIMITS FOR SOIL SAMPLES COLLECTED AT THE AFTF SOURCE AREA

Analyte	Units	WFF7AF-SB1	WFF7AF-SB2	WFF7AF-SB3	WFF7AF-SB4	WFF7AF-SB5	WFF7AF-SB6	WFF7AF-SB7	WFF7AF-SB8*
Benzene	µg/Kg	250	ND	ND	ND	ND	ND	ND	ND
Toluene	µg/Kg	560	ND	ND	ND	1600	6	ND	ND
Ethyl-benzene	µg/Kg	390	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	µg/Kg	3500	ND	ND	ND	550	180	ND	ND
Lead	mg/Kg	ND	ND	ND	ND	8.4	11	ND	ND
Manganese	mg/Kg	100	76	42	32	84	43	29	26

* WFF7AF-SB8 is a duplicate of WFF7AF-SB3.

ND - Not detected.

TABLE 4I-3. ANALYTICAL RESULTS ABOVE DETECTION LIMITS FOR SEDIMENT AND SURFACE WATER SAMPLES COLLECTED DOWNGRADIENT OF THE AFTF SOURCE AREA

ANALYTE	Units	WFF7AF-SD2 (Sediment)	WFF7AF-SD3 (Sediment)	WFF7AF-SD10 (Sediment)	Units	WFF7AF-SW1 (Water)	WFF7AF-SW2 (Water)
Chlordane	µg/Kg	6.92	ND	ND	µg/ℓ	ND	ND
Aldrin	µg/Kg	ND	ND	5.60	µg/ℓ	ND	ND
alpha-BHC	µg/Kg	ND	ND	1.74	µg/ℓ	ND	ND
gamma-BHC	µg/Kg	ND	ND	8.99	µg/ℓ	ND	ND
Endosulfan I	µg/Kg	3.83	ND	ND	µg/ℓ	ND	ND
4,4'-DDD	µg/Kg	799	ND	23,400	µg/ℓ	ND	ND
4,4'-DDE	µg/Kg	51.9	7.47	ND	µg/ℓ	ND	ND
4,4'-DDT	µg/Kg	30.5	31.1	362,000	µg/ℓ	ND	ND
Aluminum	mg/Kg	370	3600	1400	mg/ℓ	ND	ND
Arsenic	mg/Kg	0.43	0.70	0.37	mg/ℓ	ND	ND
Barium	mg/Kg	ND	25	13	mg/ℓ	ND	ND
Calcium	mg/Kg	120	330	390	mg/ℓ	8.6	9.2
Chromium	mg/Kg	ND	2.8	ND	mg/ℓ	ND	ND
Copper	mg/Kg	ND	3.7	3.0	mg/ℓ	0.083	0.042
Iron	mg/Kg	620	2900	1100	mg/ℓ	0.21	0.12
Lead	mg/Kg	ND	ND	8.9	mg/ℓ	ND	ND
Magnesium	mg/Kg	20	28	47	mg/ℓ	3.0	4.3
Manganese	mg/Kg	6.8	110	52	mg/ℓ	0.084	0.044
Potassium	mg/Kg	16	180	150	mg/ℓ	2.6	3.5
Sodium	mg/Kg	7.3	23	22	mg/ℓ	5.4	8.2
Vanadium	mg/Kg	2.9	7.9	3.5	mg/ℓ	ND	ND
Zinc	mg/Kg	4.4	7.9	6.9	mg/ℓ	ND	ND

ND - Not detected.

TABLE 4J-1. ANALYTICAL RESULTS ABOVE DETECTION LIMITS FOR BACKGROUND SEDIMENT AND SURFACE WATER SAMPLES

ANALYTE	Surface Water WFF7BA-SW1 (mg/ℓ)	Sediment WFF7BA-SD1 (mg/Kg)
4,4'-DDD	ND	9.31
Aluminum	ND	2300
Arsenic	ND	2.2
Calcium	190	590
Chromium	ND	5.4
Copper	0.033	2.4
Iron	0.16	5000
Magnesium	57	650
Manganese	0.027	38
Potassium	200	730
Sodium	4800	54,000
Vanadium	ND	5.9
Zinc	ND	15

ND - Not detected.

4K. Provide results from sampling of surface-water intakes 0 to 15 miles downstream of each source.

No surface water intakes have been identified in the 0 - 15-mile target distance. Therefore, no sampling can be completed.

4L. Estimate the size of the upgradient drainage area for each source.

As defined in 55 FR 241 (Reference 2) the drainage area includes both the source area and the area upgradient, with the exception of any portion for which runoff is diverted from entering the source by storm drains or run-on control and/or runoff management systems.

Based on that definition, the upgradient drainage area for each source area was estimated using the USGS topographic map, 1977 overflight maps of WFF, and the WFF stormdrain map. The drainage areas are summarized below, followed by a brief description of each.

	Drainage Area (Acres)
Fire Training Area	2.0
Waste Oil Dump	7.9
Aviation Fuel Tank Farm	3.7
Scrapyard	4.9
PCB Transformer	0.9

The drainage area for the Fire Training Area is comprised of the source area as defined under Item 2I, and the area immediately south and extending to the access road. The area south of the access road is diverted from the source area by the WFF stormdrain system.

The drainage area for the Waste Oil Dump includes the former dump site and a portion of Runway 17-35, which is graded slightly and appears to drain into the source area.

The drainage area for the AFTF includes the area immediately upgradient extending to Andersen Street and the source area (which includes the former tank locations and the areas between those locations).

The drainage area for the Scrapyard includes the source area and a relatively flat upgradient drainage area which includes Building N-222 and a portion of the fenced area surrounding the entire facility.

The PCB Transformer drainage area includes the source area, Building N-161C, and an additional small area adjacent to the building.

4M. Determine the 2-year, 24-hour rainfall for the site.

The 2-year, 24-hour rainfall for WFF is 3.8 inches. This figure was obtained from the Soil Conservation Service (SCS) in Accomac, Virginia (Reference 34).

4N. Discuss the average annual streamflow associated with each surface-water body located 0 to 15 miles downstream of each source.

No surface water bodies are directly associated with the Fire Training Area and Scrapyard/ PCB Transformer sites. Average annual streamflow data was unavailable for Jenneys Gut, Little Mosquito Creek, and Mosquito Creek. Given the tidal nature of the creeks in the vicinity of WFF, little emphasis is apparently placed on gauging of streamflow in this area. Persons and/or agencies contacted in seeking this data include:

William Bott
Wallops Flight Facility
National Aeronautics and Space Administration (Reference 35)

Cully Hession, Engineer
Virginia Soil and Water Conservation Commission (Reference 36)

Michelle Fults, Water Resources Planner
Virginia State Water Control Board
Water Resources Development (Reference 37)

Paul Herman
Virginia State Water Control Board
Surface Water Division (Reference 38)

4O. Determine surface soil types at the facility.

The EPA has indicated on the deficiency checklist that this data, provided in the PA/SI Reports, is acceptable. No further action is required.

4P. Determine if sources are located in a 1-year, 10-year, 100-year, or 500-year flood plain.

The EPA has indicated on the deficiency checklist that this data, provided in the PA/SI Reports, is acceptable. No further action is required.

4Q. Discuss fisheries (recreational or commercial) in surface-water bodies 0 to 15 miles downstream of each source:

4Q1. Describe annual production (in pounds) of human food chain organisms (e.g., trout, shellfish, snapping turtles, crabs) per acres of streams and rivers 0 to 15 miles downstream of each source.

All of Little Mosquito Creek and its tributaries were condemned as shellfish areas in April 1989. No data on shellfish production was available for Jenneys Gut, Mosquito Creek, or Cockle Creek. These areas are used for commercial and recreational fishing, however no landings data was available. (Reference 39.)

4Q2. Describe annual production (in pounds) of human food chain organisms (e.g., trout, shellfish, snapping turtles, crabs) per acre of ponds, lakes, bays, or oceans 0 to 15 miles downstream of each source.

All landings data in Virginia is reported on a voluntary basis. Available landings data for Chincoteague Bay and inshore (0-3 miles) ocean was provided by the Virginia Marine Resources Commission (Reference 39). That data is presented, by species, in Table 4Q2-1 for Chincoteague Bay and Table 4Q2-2 for the inshore ocean.

4R. Identify closed fisheries 0 to 15 miles downstream of each source.

The Virginia Marine Resources Commission did not report any closed fisheries in the vicinity of WFF. The Virginia Department of Health provided a listing of condemned shellfish areas in the vicinity. The most significant closure is Little Mosquito Creek. The shellfish condemnations reported resulted either from high fecal coliform bacteria levels or permitted discharge locations. Closures to shellfish harvesting in the vicinity of permitted discharges serve as buffer zones to ensure public health. The condemnation notices are included in Volume II of this report (Reference 32).

TABLE 4Q2-1. REPORTED ANNUAL PRODUCTION OF HUMAN FOOD CHAIN ORGANISMS: CHINCOTEAGUE BAY

CHINCOTEAGUE BAY LANDINGS										
SPECIES	1986		1987		1988		1989		1990	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
Blue Crab	72,560	$25,249	12,123	$ 6,062	160,080	$ 79,512	180,086	$ 54,026	57,852	$ 30,349
Quahog	35,319	35,699	50,130	62,571	109,608	173,975	146,269	127,658	115,115	125,989
Oysters	4,082	10,693	19,295	69,160	1,563	5,805	7,083	27,516	1,618	5,951
American Eel									434	651
Northern Puffer	200	400								
Bluefish							11,409	3,166		
Butterfish							371	169		
Atlantic Croaker							12	7		
Grey Seatrout							757	960		
Sharks							207	104		
Spanish Mackerel							23	11		
Spot							10,769	5,133		
Fish, Other							420	35		
TOTALS	112,161	$72,041	81,548	$137,793	271,251	$259,292	357,406	$218,785	175,019	$162,940

Source: Virginia Marine Resources Commission

TABLE 4Q2-2. REPORTED ANNUAL PRODUCTION OF HUMAN FOOD CHAIN ORGANISMS: INSHORE (0-3 MILES) OCEAN

INSHORE (0-3 MILES) OCEAN LANDINGS										
SPECIES	1986		1987		1988		1989		1990	
	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value	Pounds	Value
Angler	20	$ 20	44	$ 23	140	$ 84	41	$ 41	44	$ 54
Bluefish	180,153	17,704	177,756	30,480	140,725	20,261	109,660	20,861	178,650	38,733
Bonito			8	2	35	25				
Butterfish	6,449	1,977	2,165	944	2,452	994	5,456	2,076	7,251	2,706
Cobia			31	6	100	20	49	37	90	73
Atlantic Croaker	140,902	41,772	31,973	15,077	37,415	14,217	21,210	14,996	669	429
Drum, Red	26	7	62	19			467	140		
Drum, Black	4,204	1,592							86	52
Flounder, Summer	4,178	5,893	94,211	149,661	13,273	20,202	365	557	37	38
Hake, Red	136	22	12	2	286	32	565	72	2,149	475
King Mackerel	36	39	250	95	64	100	220	430	525	832
King Whiting	428	161	1,617	493	450	152	373	118	3,418	1,706
Atlantic Mackerel	208	47	692	286	1,194	465	5,000	500	3,167	667
Mullets	7	2	348	107			216	54	1	1
Scup	100	33	160	60	750	300	25	6	157	49
Pigfish									37	5
Black Sea Bass	150	139	372	475	26	48	2	2	100	82
Grey Seatrout	186,580	61,856	135,498	80,362	60,449	40,844	73,707	87,786	134,891	107,316
American Shad	50,450	7,508	173,172	59,426	125,587	37,066	117,894	27,679	142,213	63,088
Dogfish	3,557	684	2,479	745	8,516	4,088	4,356	2,172	12,709	5,803
Sharks	2,582	721	2,958	698	6,683	2,520	6,959	2,968	940	478
Spanish Mackerel	582	146	5,044	2,510	45,648	15,987	14,135	6,337	5,213	2,049
Spot	22,264	5,999	128,792	35,781	25,676	10,865	25,635	11,268	90,518	54,493

Source: Virginia Marine Resources Commission

TABLE 4Q2-2 (CONTINUED)

Northern Puffer	190	$ 400			275	$ 70	23	$ 19		
Tuna	258	33	279	$ 104	662	69	1,030	306	1,193	$ 168
Silver Hake	913	329								
Horseshoe Crab	37,064	4,417	3,590	449						
Conchs	25,150	14,882	63,002	32,842	2,432	1,156	22	13	16	3
Fish, Other	36,137	2,675	112,671	8,944	62,150	5,369	62,573	5,478	18,332	1,873
Scallops			360	1,127						
Squid			30	12	3	1				
Shellfish, Other			10	4	269	77				
TOTALS	702,724	$169,058	938,276	$420,784	535,260	$175,012	449,983	$183,916	602,426	$281,173

Source: Virginia Marine Resources Commission

4S. Provide results from sampling of human food chain organism tissues in streams and rivers 0 to 15 miles downstream of each source and in ponds, lakes, and bays that receive drainage from the sources.

As no evidence of direct surface water contamination resulting from the source areas at WFF was found, sampling of human food chain organism tissues 0 to 15 miles downstream has not been completed, and is deemed unnecessary. In addition, due to the tidal nature of the downstream surface water bodies, tissue sampling would not be truly representative of these source areas.

SECTION FIVE: AIR PATHWAY INFORMATION

5A. Describe if there has been an observed release (i.e., visual or analytical evidence) of a hazardous substance to the atmosphere.

The EPA has indicated on the deficiency checklist that this discussion, provided in the PA/SI Reports, is acceptable. No further discussion is required.

5B. Determine the shortest distance to the closest residence or regularly occupied building or area from any on-site source.

Fire Training Area: The closest regularly occupied building to the Fire Training Area is NASA Building M-15, Rocket Storage and Inspection Shelter No. 1 (Reference 40). Rocket motors, ignitions, and pyrotechnics are inspected and stored at the facility, which is located approximately 1750 feet from the Fire Training Area.

Waste Oil Dump: The closest regularly occupied building to the Waste Oil Dump is NASA Building A-41, Runway FPS-16 Radar Operations (Reference 40). Building A-41 is approximately 1800 feet distant from the Waste Oil Dump site.

Aviation Fuel Tank Farm: The closest regularly occupied building to the AFTF is NASA Building B-129, Aircraft Fire and Crash Building (Reference 40). Building B-129 is approximately 300 feet from the perimeter of the AFTF area.

Scrapyard/PCB Transformer: The closest regularly occupied building to the Scrapyard site is NASA Building N-222, Surplus Utilization and Disposal Building, which is immediately adjacent to the Scrapyard site and enclosed in the fenced area (Reference 40). The building closest to the PCB Transformer site is the immediately adjacent NASA Building N-161, Flight Information Control and Analysis Laboratory.

5C. Determine if any of the following resources are located within a 1/2-mile radius of each source.

5C1. Commercial agriculture.

No commercial agriculture is located within a 1/2-mile radius of the Fire Training Area, Waste Oil Dump, or the AFTF. Within a 1/2-mile radius of the Scrapyard/PCB Transformer site, a small portion of NASA property has been periodically leased to local farmers for agricultural purposes. The area, located southwest of the Main Gate and northwest of the intersection of State Roads 175 and 765, is scheduled for development for Navy housing (Reference 7).

5C2. Commercial silviculture.

No commercial silviculture areas have been identified within a 1/2-mile radius of any of the identified sources.

5C3. Major or designated recreation area.

No major or designated recreation areas, defined as primary contact water recreation areas (Reference 37) are located within a 1/2-mile radius of the Fire Training Area or the Waste Oil Dump. The 1/2-mile radii for the AFTF site and the Scrapyard/PCB Transformer extend to the east of State Road 175 to the Wallops Island National Wildlife Refuge. However, this area is a wildlife preserve with limited human traffic and is not considered a major recreation area.

5D. Determine if sensitive environments are within a 4-mile radius of each source.

The Wallops Island National Wildlife Refuge is located within 4 miles of each of the source areas. The refuge, which is managed by the U. S. Department of Interior, Fish and Wildlife Service (FWS), is located east and southeast of State Road 175, adjacent to the Main Base. The Wallops Island Wildlife Refuge is a preserve managed by the FWS in conjunction with

the Chincoteague National Wildlife Refuge. The Wallops Island Refuge is utilized primarily for limited wildfowl hunting and wildlife and habitat surveys.

5E. Determine the total area of wetlands within a 4-mile radius of each source.

The wetlands areas were determined from the U.S. Fish and Wildlife Service National Wetlands Inventory Map (Reference 33). The wetlands area within a 4-mile radius of each source are as follows:

Fire Training Area:	11,690 acres
Waste Oil Dump:	12,400 acres
Aviation Fuel Tank Farm:	14,646 acres
Scrapyard/PCB Transformer:	12,969 acres

SECTION SIX: SOIL EXPOSURE PATHWAY INFORMATION

6A. Describe any areas of contamination that are within 2 feet of the ground surface; provide the areal extent of contamination.

The EPA has indicated on the deficiency checklist that this information, provided in the PA/SI Reports, is acceptable. No further discussion is required.

6B. Provide locations and depths of soil samples and results.

The EPA has indicated on the deficiency checklist that this information, provided in the PA/SI Reports, is acceptable. No further discussion is required.

6C. Provide results of background soil sampling.

The EPA has indicated on the deficiency checklist that this information, provided in the PA/SI Reports, is acceptable. No further discussion is required.

6D. Describe the measures taken to limit access to areas with soil contamination within two feet of the surface (e.g., fences, security guards).

Access to the WFF is limited by marshland and water in the northeast and northwest quadrants, and by a chain-link security fence in the southeast and southwest quadrants. Entrance to the Main Base is controlled by a manned security gate. All personnel and visitors are required to have badges and vehicle passes, and security personnel complete routine security patrols throughout the Main Base Area. In addition, the Scrapyard area is isolated by a chain link fence with a locking gate.

All excavation, including soil sampling, requires a digging permit from the NASA Facilities Engineering Branch. Digging request forms must be submitted in advance of any on-base excavation activities.

6E. Determine if any of the following are located near or within an area of soil contamination (within 2 feet of the surface); provide the number of individuals for 6E1 and 6E2:

6E1. Within 200 feet of any residences, schools, or day care centers and within the property boundary.

No residences, schools, or day care centers are located within 200 feet of the Fire Training Area, Waste Oil Dump, AFTF, or Scrapyard/PCB Transformer sites. Therefore, the number of individuals meeting this criteria is zero.

6E2. Within 200 feet of the work place area and within a work place property boundary.

The Scrapyard and PCB Transformer areas are adjacent to regularly occupied work areas. Building N-222, adjacent to the Scrapyard, is the Surplus Utilization and Disposal Building. Two NASA personnel regularly work in Building N-222. Building N-161, adjacent to the PCB Transformer site, is the Flight Information Control and Analysis Laboratory. A total of 65 personnel work in Building N-161 (Reference 18).

6E3. Within boundaries of commercial agriculture, silviculture, livestock production, or grazing area.

The source areas evaluated in this report are not within the boundaries of commercial agriculture, silviculture, livestock production, or grazing areas.

6E4. Within boundaries of a terrestrial-sensitive environmental (see Table 5-5, December 1990 Federal Register).

The source areas evaluated in this report are not within the boundaries of a terrestrial sensitive environment as defined in Table 5-5 of the 40 CFR 300 Amendment published in 55 FR 241.

6F. Determine the number of individuals who live, work, or attend school within the following distances of soil contamination (within 2 feet of the surface).

Number of Individuals within Target Distances of Soil Contamination

RADIUS		Fire Training Area	Aviation Fuel Tank Farm	Scrapyard/PCB Transformer
6F1.	0 - 1/4 mile	85	329	257
6F2.	1/4 - 1/2 mile	347	277	709
6F3.	1/2 - 1 mile	415	695	299

(References 4, 6, and 18.)

The Waste Oil Dump site was not included in the above table as no indication of remaining soil contamination was found during the SI and this Revision of SI.

SECTION 7.0: REFERENCES

1. NASA, 1990. National Aeronautics and Space Administration. "Final Summary Report - Scrapyard, PCB Transformer, Photographic Tank, Waste Oil Dump, NASA Wallops Flight Facility." Prepared by Ebasco Services, Inc., September 1990.

2. USEPA, 1990. United States Environmental Protection Agency, "Appendix A to Part 300 (Amended) - Uncontrolled Hazardous Waste Site Ranking System; A Users Manual," 40 CFR Part 300, Federal Register, Volume 55, No. 241, December 14, 1990.

3. NASA, 1990. National Aeronautics and Space Administration, "Final Site Inspection Report, Wallops Flight Facility," Prepared by Ebasco Services, Inc., January 1990.

4. Accomack County, 1990 (?). "1990 U.S. Census Population Counts, Accomack-Northampton Planning District." Provided by Sandra Manter, Environmental Planner, Accomack County Department of Environmental Affairs.

5. Accomack County, 1989. "Accomack County Comprehensive Plan, County of Accomack, Virginia." Prepared by Accomack County Planning Commission, September 1989. Provided by Sandra Manter, Environmental Planner, Accomack County Department of Environmental Affairs, pp. II-1 - II-3, II-74, II-81.

6. NASA, 1991. National Aeronautics and Space Administration. "Revised Final Corrective Action Plan, Aviation Fuel Tank Farm, Wallops Flight Facility." pp. 50-52. Prepared by Ebasco Services, Inc., August 1991.

7. NASA, 1988. National Aeronautics and Space Administration. "Goddard Space Flight Center Facilities Master Plan, Volume 3, Wallops Flight Facility." June 1988, pp. 3-36, 3-37, 3-45, 3-60.

8. NASA, 1992. National Aeronautics and Space Administration. Personal communication between Theresa Spagnuolo of NASA and K. Thorpe (Metcalf & Eddy), April 30, 1992 (site visit).

9. NASA, 1990. National Aeronautics and Space Administration. "Final Soil Gas Report, Wallops Flight Facility." Prepared by Ebasco Services, Inc., September 1990.

10. NASA, 1992. National Aeronautics and Space Administration. "Final Design Investigation of the Aviation Fuel Tank Farm Area, Wallops Flight Facility." Prepared by Metcalf & Eddy, May 1992. Appendix H.

11. NASA, 1992. National Aeronautics and Space Administration. "Field Sampling and Analysis Plan, Delivery Order 7, Revision of Site Investigation, Wallops Flight Facility." Prepared by Metcalf & Eddy, May 1992.

12. NASA, 1988. National Aeronautics and Space Administration. "Preliminary Assessment Report for Wallops Flight Facility." Prepared by Ebasco Services, Inc., April 1988.

13. Commonwealth of Virginia, 1991. Letter from Mary Ann Sykes, State Water Control Board, Groundwater Program to P. Klinedinst (Metcalf & Eddy), December 20, 1991. Enclosure: STORET Database Printout.

14. Commonwealth of Virginia, 1992. Letter from Evans Massie, Compliance Officer, State Water Control Board, Division of Water Supply Engineering, to P. Klinedinst (Metcalf & Eddy), January 24, 1992. Enclosure: Public Water Supplies Listing.

15. Accomack County, 1992. Personal communication between Pierce Eichelberger of the Accomack County Department of Environmental Affairs, and K. Thorpe (Metcalf & Eddy) July 1992.

16. Commonwealth of Virginia, 1990. Virginia Regulation VR 680-15-01. "Water Withdrawal Reporting." State Water Control Board, December 1990.

17. Commonwealth of Virginia, 1991. Letter from Michelle Fults, Water Resources Planner, State Water Control Board to P. Klinedinst (Metcalf & Eddy), November 19, 1991. Enclosures: 1990 pumpage data for NASA and Town of Chincoteague water supply wells; excerpt from "Eastern Shore Water Supply Plan," Virginia State Water Control Board Planning Bulletin 342, March 1988. pp. II-2, II-15 - II-23.

18. NASA, 1992. National Aeronautics and Space Administration. Facsimile transmittal from T. Spagnuolo of NASA to K. Thorpe (Metcalf & Eddy), February 11, 1992.

19. NOAA, 1992. National Oceanic and Atmospheric Administration. Personal communication between Ed Seman, Manager of NOAA and E. Hogan (Metcalf & Eddy), April 23, 1992. On-going operations interview.

20. NASA, 1992. National Aeronautics and Space Administration. Monthly average precipitation and temperature data, NASA Climatological Center.

21. Horsley Witten Hegemann, Inc., 1991. "Groundwater Supply Protection and Management Plan for the Eastern Shore of Virginia, Final Report." Prepared for Eastern Shore of Virginia Groundwater Study Committee, August 13, 1992. pp. 2-4, 2-7, 2-8.

22. Commonwealth of Virginia, 1991. Personal communication between Paul Herman of the State Water Control Board and P. Klinedinst (Metcalf & Eddy), January 2, 1992.

23. U.S. Fish and Wildlife Service, 1992. "Draft Environmental Impact Statement for the Chincoteague National Wildlife Refuge Master Plan." January 1992.

24. U.S. Fish and Wildlife Service, 1991. "Economic Analysis of Designating Critical Habitat for the Atlantic Coast Population of the Piping Plover," Draft. Prepared by Richard Aiken and Anne Hecht. June 1991.

25. Commonwealth of Virginia, 1991. "Federal and State Listed Endangered and Threatened Species in Virginia," Virginia Department of Game and Inland Fisheries, October, 1991.

26. Commonwealth of Virginia, 1992. Personal communication between Karen Terwilliger, Virginia Department of Game and Inland Fisheries, and K. Thorpe (Metcalf & Eddy), August 26, 1992.

27. NASA, 1991. National Aeronautics and Space Administration. Memorandum for the Record from Pamela Whitman of NASA, June 20, 1991.

28. NASA, 1992. National Aeronautics and Space Administration. Personal Communication between Pamela Whitman of NASA and K. Thorpe (Metcalf & Eddy), June 19, 1992.

29. NASA, 1991(?). National Aeronautics and Space Administration. "Environmental Assessment for Construction of Force Main from Wallops Island to the Wallops Flight Facility Main Base." Not dated. p. 6.

30. Commonwealth of Virginia, 1991. Personal communication between Sonya Knur of the Virginia Marine Resources Commission and P. Klinedinst (Metcalf & Eddy), December 20, 1991.

31. Accomack County, 1992. Personal communication between Paul Widgin of the Accomack County Shellfish Sanitation Bureau and K. Thorpe (Metcalf & Eddy), January 10, 1992.

32. Commonwealth of Virginia, 1991. Facsimile transmittal of Shellfish Area Condemnation Notices from Keith Skiles, Virginia Department of Health Office of Water Programs to P. Klinedinst (Metcalf & Eddy), December 18, 1991.

33. U.S. Department of the Interior, 1978. National Wetlands Inventory Maps (Hallwood and Chincoteague West Quadrangles). Fish and Wildlife Service, 1978.

34. USDA, 1992. United States Department of Agriculture. Personal communication between Rodney Lewis, District Conservation Officer, of the USDA Soil Conservation Service, Accomac, Virginia and K. Thorpe (Metcalf & Eddy), February 6, 1992.

35. NASA, 1992. National Aeronautics and Space Administration. Personal communication between William Bott of NASA and K. Thorpe (Metcalf & Eddy), January 29, 1992.

36. Commonwealth of Virginia, 1992. Personal communication between Cully Hession of the Virginia Soil and Water Conservation Commission and K. Thorpe (Metcalf & Eddy), January 31, 1992.

37. Commonwealth of Virginia, 1992. Personal communication between Michelle Fults of the Virginia State Water Control Board and K. Thorpe (Metcalf & Eddy), March 19, 1992.

38. Commonwealth of Virginia, 1992. Personal communication between Paul Herman of the Virginia State Water Control Board and K. Thorpe (Metcalf & Eddy), January 1992.

39. Commonwealth of Virginia, 1992. Chincoteague Bay and Inshore Ocean Landings Data (1986-1990). Provided by Sonya Knur, Virginia Marine Resources Commission, January 1992.

40. NASA, 1992. National Aeronautics and Space Administration. Personal communication between Theresa Spagnuolo of NASA and R. Williams (Metcalf & Eddy). Document in Metcalf & Eddy Memorandum from R. Williams to E. Hogan, January 27, 1992.

APPENDIX A

MAP POCKETS

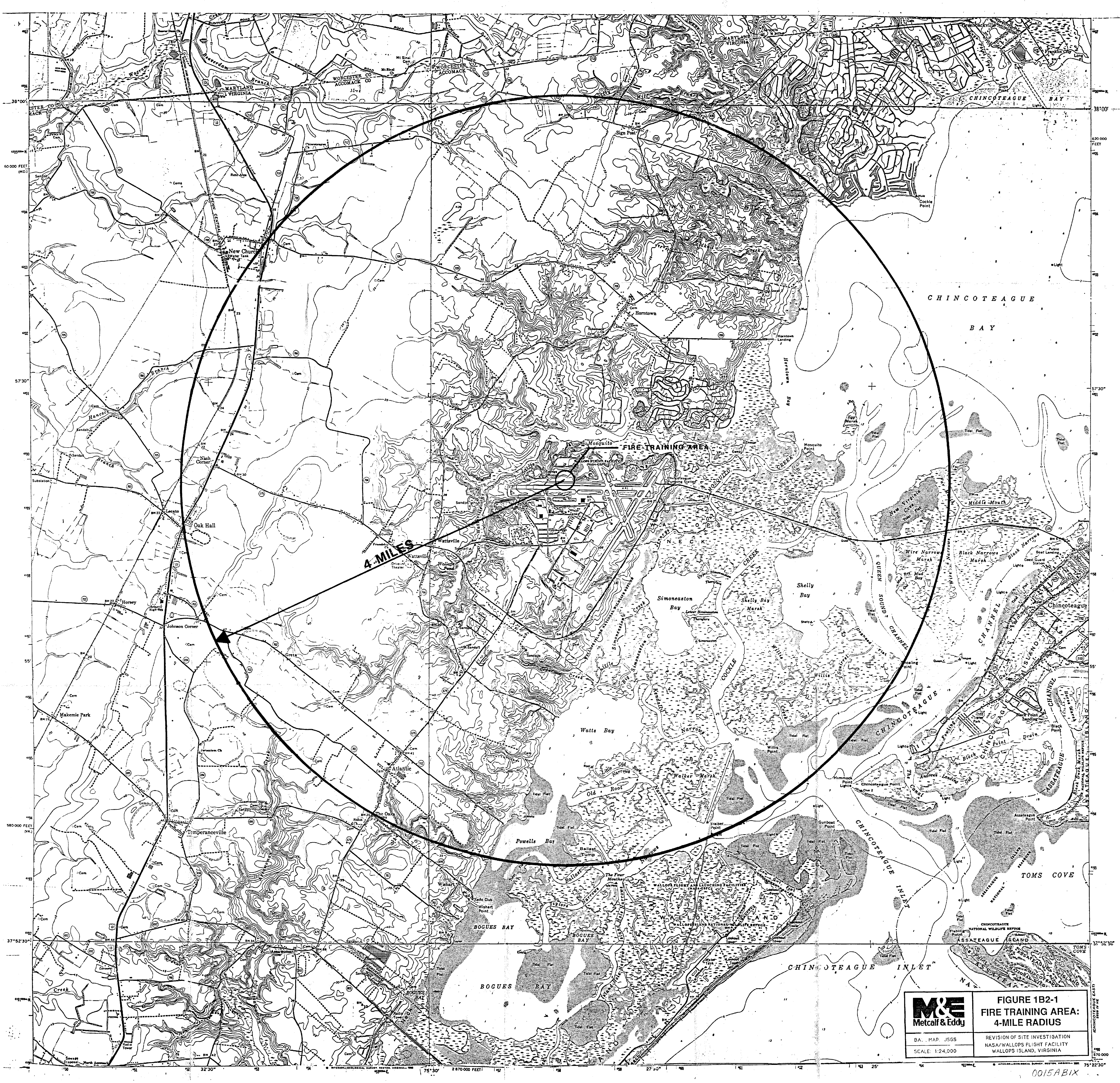


FIGURE 1B2-1
FIRE TRAINING AREA:
4-MILE RADIUS

REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA

0015ABIX

4-MILES

AVIATION FUEL TANK FARM

CHINCOTEAGUE BAY

CHINCOTEAGUE INLET

WALLOPS ISLAND

ASSATEAGUE ISLAND

BOGUES BAY

Watts Bay

Powells Bay

TOMS COVE

Horntown

New Church

Oak Hall

Temperanceville

Atlantic

Wattsville

Chincoteague

Horntown Landing

Mosquito Point

Cockle Point

Shelly Bay

Simoneaston Bay

Willis Marsh

Walker Marsh

Gunboat Point

Assateague Point

Black Point

Chincoteague Point

Hammock Point

Shoaling Point

Wallops Island National Wildlife Refuge

Chincoteague National Wildlife Refuge

Assateague National Seashore

Metcalf & Eddy

FIGURE 1B2-3
AVIATION FUEL TANK FARM: 4-MILE RADIUS

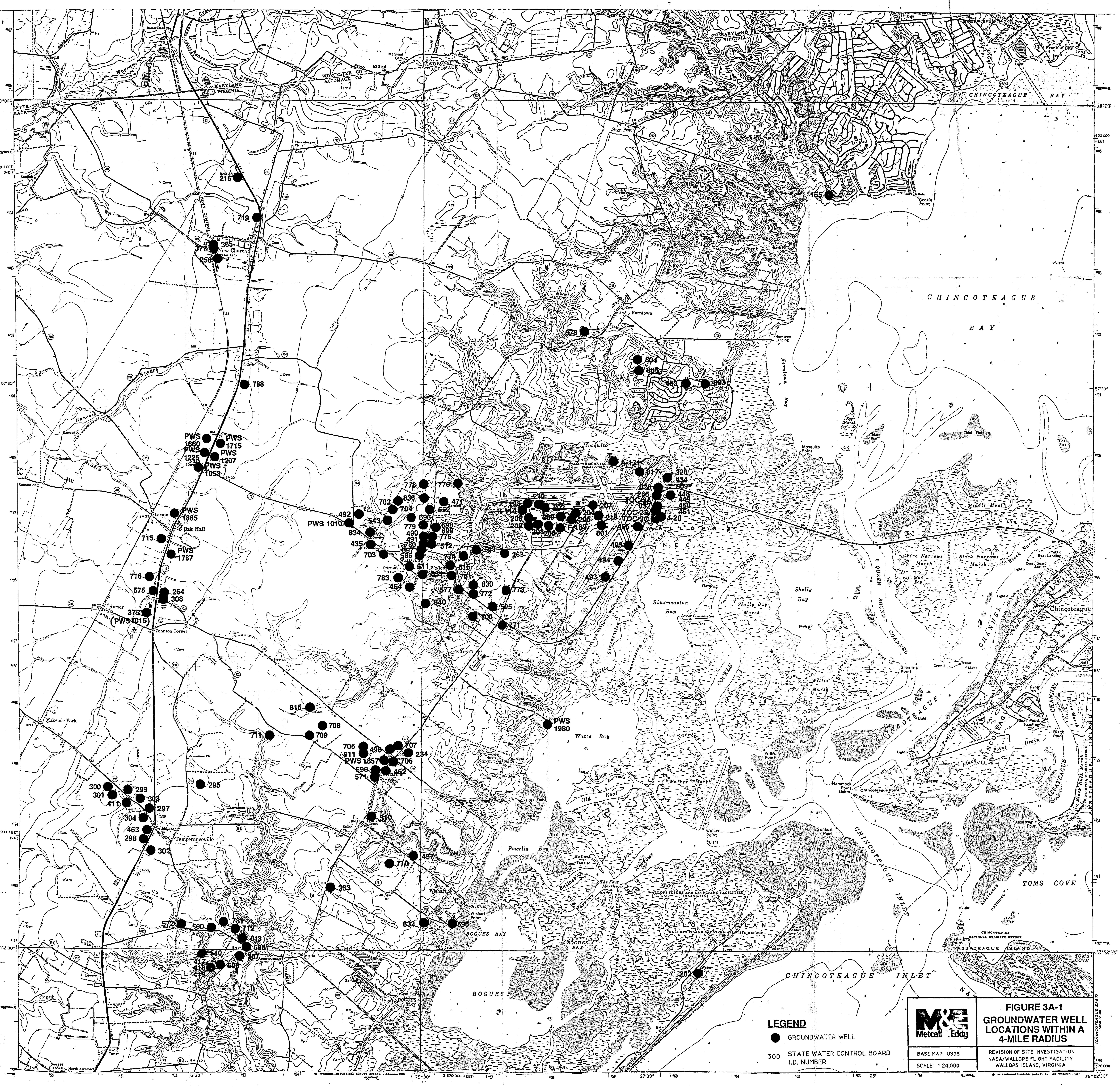
BASE MAP: USGS

SCALE: 1:24,000

REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA

FIGURE 1B2-4
SCRAPYARD/PCB TRANSFORMER: 4-MILE RADIUS

REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA


LEGEND
GROUNDWATER WELL
300 STATE WATER CONTROL BOARD I.D. NUMBER
Metcalf & Eddy
FIGURE 3A-1
GROUNDWATER WELL LOCATIONS WITHIN A 4-MILE RADIUS
BASE MAP: USGS
SCALE: 1:24,000
REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA
CHINCOTEAGUE BAY
CHINCOTEAGUE INLET
BOGUES BAY
TOMS COVE
WATTS BAY
SIMONEASTON BAY
New Church
Horntown
Oak Hall
Temperanceville
Chincoteague

DOMESTIC WATER
WALLOPS FLIGHT FACILITY
MAIN BASE

NASA
National Aeronautics and Space Administration
Goddard Space Flight Center

North

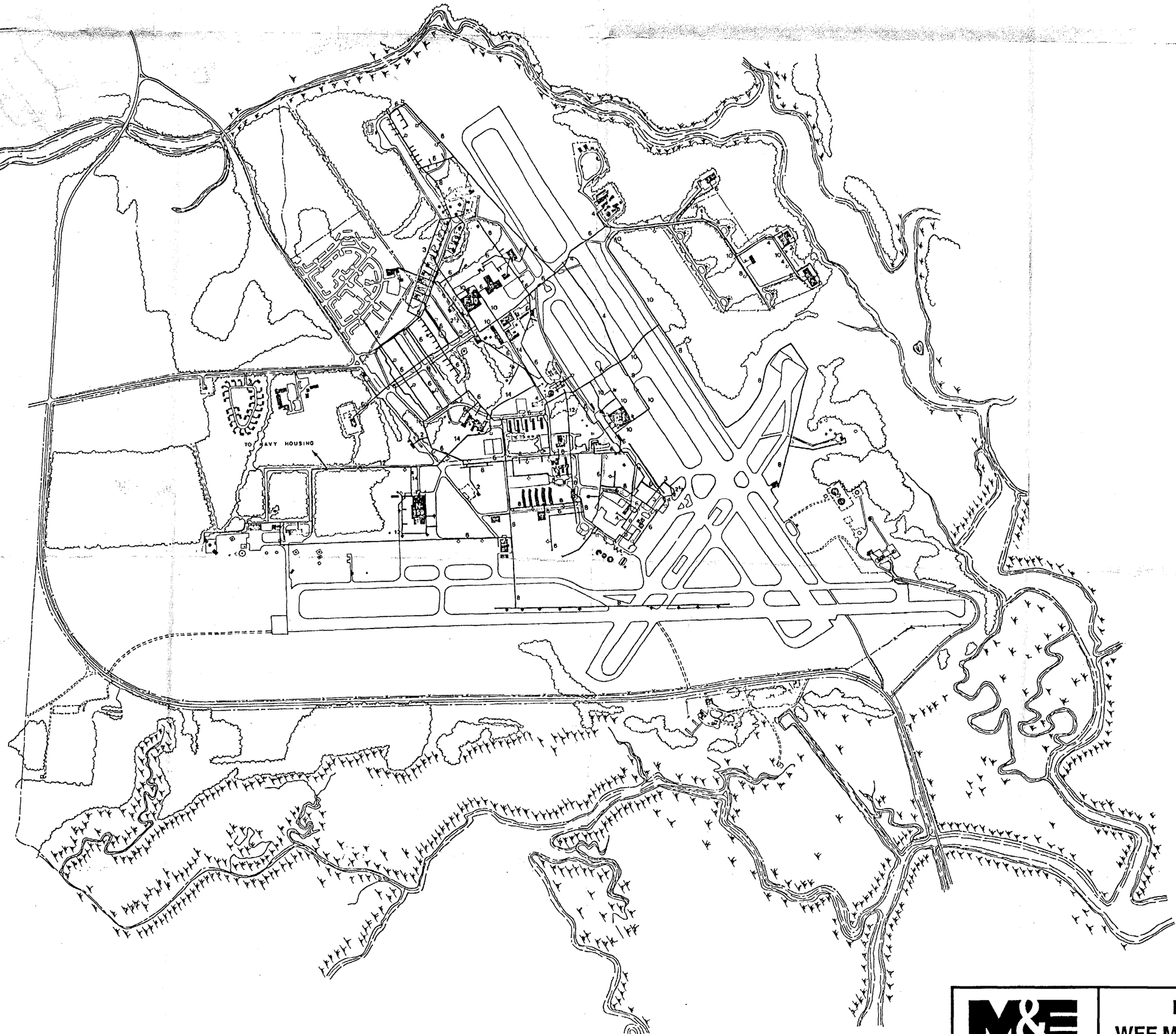
0 500 1000 2000 3000
Scale in feet

Water Line

Fire Hydrant

Flush Type Hydrant

8 Pipe Size (in inches)



Metcalf & Eddy	**FIGURE 3B-2** **WFF MAIN BASE WATER DISTRIBUTION SYSTEMS**
BASE MAP: NASA	REVISION OF SITE INVESTIGATION NASA/WALLOPS FLIGHT FACILITY WALLOPS ISLAND, VIRGINIA
SCALE: 1"=1000'	

LITTLE MOSQUITO CREEK

WASTEPOOL DUMP SOURCE AREA

MOSQUITO CREEK

AMATION TIDEL TANK FARM SOURCE AREA

JENNEYS GUT

CHINCOTEAGUE BAY

CHINCOTEAGUE INLET

NOTE: CREEKS AND BAYS IN THE VICINITY OF THE WALLOPS FLIGHT FACILITY ARE SUBJECT TO TIDAL INFLUENCE AND FLUSHING.

LEGEND

GENERAL DRAINAGE PATTERN

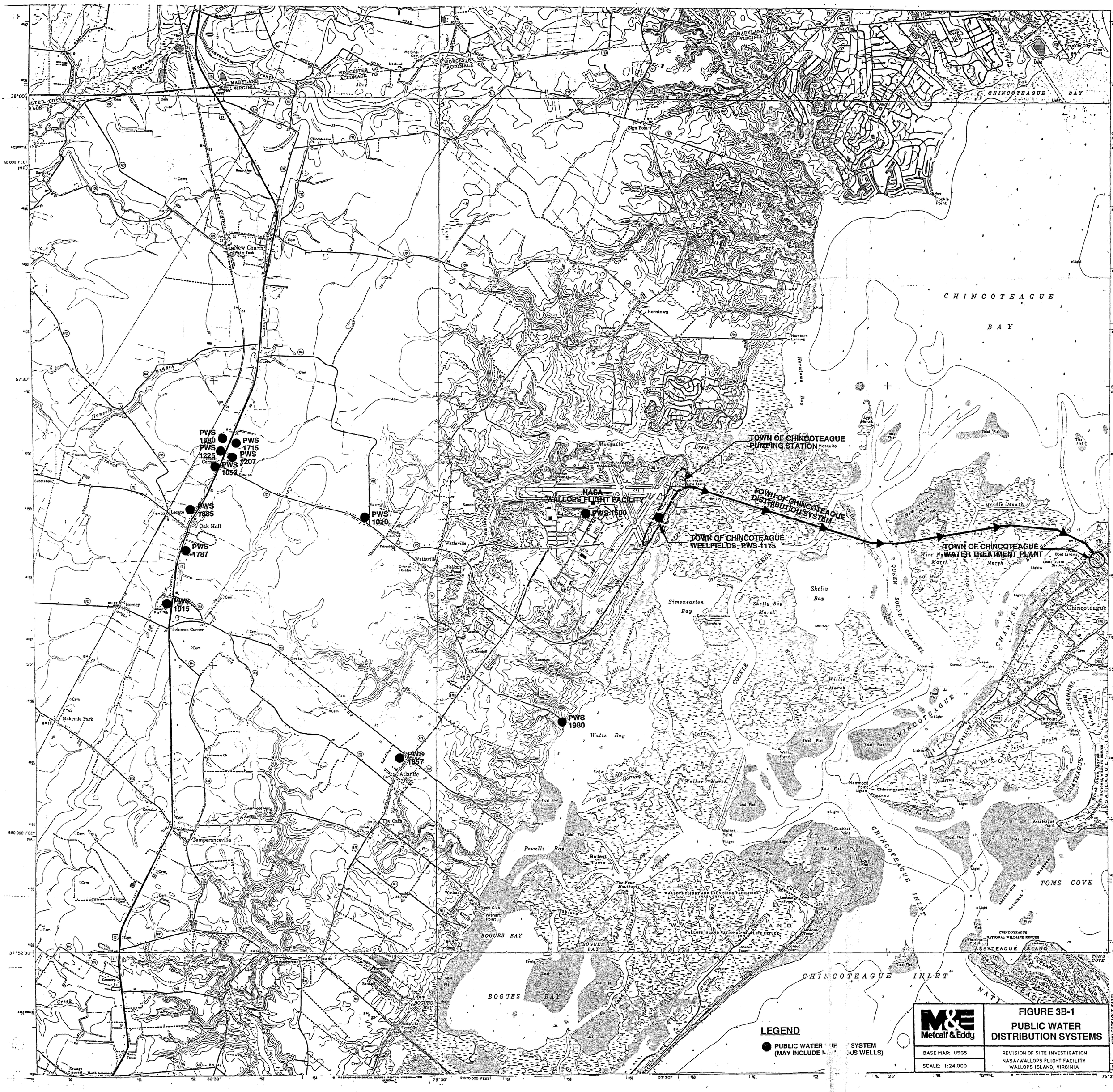
Metcalf & Eddy

FIGURE 4A-1
SURFACE RUNOFF PATTERNS AND NEAREST SURFACE WATER BODY

BASE MAP: USGS

SCALE: 1:24,000

REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA


PWS 1680
PWS 1715
PWS 1225
PWS 1207
PWS 1053
PWS 1885
PWS 1010
PWS 1787
PWS 1015
PWS 1980
PWS 1857
PWS 1500
NASA WALLOPS FLIGHT FACILITY
TOWN OF CHINCOTEAGUE PUMPING STATION
TOWN OF CHINCOTEAGUE DISTRIBUTION SYSTEM
TOWN OF CHINCOTEAGUE WELLFIELDS PWS-1175
TOWN OF CHINCOTEAGUE WATER TREATMENT PLANT
CHINCOTEAGUE BAY
BOGUES BAY
TOMS COVE
CHINCOTEAGUE INLET
WALLOPS ISLAND
ASSATEAGUE ISLAND
Temperanceville
Atlantic
Wattsville
Oak Hall
Johnson Corner
Makemie Park
Horntown
Greenbackville
Chincoteague
Watts Bay
Powells Bay
Shelly Bay
Simoneaston Bay
LEGEND
PUBLIC WATER SYSTEM (MAY INCLUDE NON-COMMUNITY WELLS)
Metcalf & Eddy
FIGURE 3B-1
PUBLIC WATER DISTRIBUTION SYSTEMS
BASE MAP: USGS
SCALE: 1:24,000
REVISION OF SITE INVESTIGATION
NASA/WALLOPS FLIGHT FACILITY
WALLOPS ISLAND, VIRGINIA

APPENDIX B

E_1 CALCULATIONS

Project _____ Acct. No. _____ Page _____ of _____

Subject Net Annual Precipitation Comptd. By Kat Date 2/6/92

Detail _____ Ck'd. By _____ Date _____

From the Federal Register, December 14, 1990, pg. 51,600.

① Calculate monthly potential evapotranspiration (E_i), in lieu of actual evapotranspiration data, as follows:

$$E_i = 0.6 F_i (10 T_i / I)^a \text{ where:}$$

E_i = Monthly potential evapotranspiration (inches) for month i

F_i = Monthly latitude adjusting value for month i

T_i = Mean monthly temperature (°C) for month i

$$I = \sum_{i=1}^{12} (T_i/5)^{1.514}$$

$$a = 6.75 \times 10^{-7} I^3 - 7.71 \times 10^{-5} I^2 + 1.79 \times 10^{-2} I + 0.49239$$

② Mean monthly temperature data in °F was provided by NASA. *

	Mean Temp. (°F)	T_i (°C) **
Jan	35.5	1.9
Feb	37.7	3.2
Mar	44.3	6.8
Apr	53.2	11.8
May	62.5	16.9
Jun	71.0	21.7
Jul	76.3	24.6
Aug	75.2	24.0
Sep	69.1	20.6
Oct	59.2	15.1
Nov	48.8	9.3
Dec	40.3	4.6

* Jan 1951 - Jan 1959; Jan 1963 - Dec 1988

** °C = 5/9 (°F - 32)

③ Compute I.

$$I = \sum_{i=1}^{12} (T_i/5)^{1.514} = 60.76$$

© Compute a.

$$a = 6.75\times10^{-7} I^3 - 7.71\times10^{-5} I^2 + 1.79\times10^{-2} I + 0.49239$$

Where $I = 60.76$

$a = 1.45$

(d) Determine monthly latitude adjusting values (F_i) from Table 3-3, pg 51600, FR 55241, December 14, 1990, by interpolation using latitude = 38°N.

	F_i
Jan	0.85
Feb	0.84
Mar	1.03
Apr	1.10
May	1.23
Jun	1.23
Jul	1.25
Aug	1.17
Sep	1.04
Oct	0.96
Nov	0.85
Dec	0.83

(e) Determine E_i where $E_i = 0.6 F_i (10 T_i / I)^a$.

	F_i	T_i (°C)	E_i (inches)
Jan	0.85	1.9	0.09
Feb	0.84	3.2	0.20
Mar	1.03	6.8	0.73
Apr	1.10	11.8	1.73
May	1.23	16.9	3.25
Jun	1.23	21.7	4.67
Jul	1.25	24.6	5.70
Aug	1.17	24.0	5.15
Sep	1.04	20.6	3.66
Oct	0.96	15.1	2.16
Nov	0.85	9.3	0.95
Dec	0.83	4.6	0.33

Project [illegible] Acct. No. [illegible] Page [illegible] of [illegible]

Subject Net Annual Precipitation Comptd. By Kat Date 2/6/92

Detail Ck'd. By Date

② Compute Annual Net Precipitation by subtracting monthly potential evapotranspiration (E_i) from monthly precipitation data provided by NASA.

	Precip (in)	E_i (in)	Net Precip (in)
Jan	3.08	0.09	2.99
Feb	2.86	0.20	2.66
Mar	3.47	0.73	2.74
Apr	2.64	1.73	0.91
May	3.08	3.25	0
Jun	2.97	4.67	0
Jul	3.27	5.70	0
Aug	4.08	5.15	0
Sep	2.94	3.66	0
Oct	2.76	2.16	0.60
Nov	2.76	0.95	1.81
Dec	2.84	0.33	2.51

Annual Net Precipitation 14.22 inches

APPENDIX C

ANALYTICAL RESULTS

Polychlorinated Biphenyls
EPA Method 8080

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7PC-SD1
SPECTRALYTIX Sample ID: MET92-001-92050662 Sample Type: Soil
Date Sampled : 05/19/92 Date Received: 05/21/92
Date Extracted: 05/27/92 Date Analyzed: 06/02/92

Analyte	Result	Detection Limit	Units
PCB-1016	ND	50	µg/kg
PCB-1221	ND	50	µg/kg
PCB-1232	ND	50	µg/kg
PCB-1242	ND	50	µg/kg
PCB-1248	ND	50	µg/kg
PCB-1254	ND	50	µg/kg
PCB-1260	ND	50	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Polychlorinated Biphenyls
EPA Method 8080

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7PC-SD2
SPECTRALYTIX Sample ID: MET92-001-92050663 Sample Type: Soil
Date Sampled : 05/19/92 Date Received: 05/21/92
Date Extracted: 05/27/92 Date Analyzed: 06/02/92

Analyte	Result	Detection Limit	Units
PCB-1016	ND	50	µg/kg
PCB-1221	ND	50	µg/kg
PCB-1232	ND	50	µg/kg
PCB-1242	ND	50	µg/kg
PCB-1248	ND	50	µg/kg
PCB-1254	ND	50	µg/kg
PCB-1260	ND	50	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Polychlorinated Biphenyls
EPA Method 8080

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7SY-SD1
SPECTRALYTIX Sample ID: MET92-002-92050751 Sample Type: Soil
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Extracted: 05/28/92 Date Analyzed: 06/02/92

Analyte	Result	Detection Limit	Units
PCB-1016	ND	50	µg/kg
PCB-1221	ND	50	µg/kg
PCB-1232	ND	50	µg/kg
PCB-1242	ND	50	µg/kg
PCB-1248	ND	50	µg/kg
PCB-1254	ND	50	µg/kg
PCB-1260	ND	50	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Polychlorinated Biphenyls
EPA Method 8080

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7SY-SD2
SPECTRALYTIX Sample ID: MET92-001-92050665 Sample Type: Soil
Date Sampled : 05/19/92 Date Received: 05/21/92
Date Extracted: 05/27/92 Date Analyzed: 06/02/92

Analyte	Result	Detection Limit	Units
PCB-1016	ND	50	µg/kg
PCB-1221	ND	50	µg/kg
PCB-1232	ND	50	µg/kg
PCB-1242	ND	50	µg/kg
PCB-1248	ND	50	µg/kg
PCB-1254	ND	50	µg/kg
PCB-1260	1,600	50	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Polychlorinated Biphenyls
EPA Method 8080

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7SY-SD3
SPECTRALYTIX Sample ID: MET92-002-92050752 Sample Type: Soil
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Extracted: 05/28/92 Date Analyzed: 06/02/92

Analyte	Result	Detection Limit	Units
PCB-1016	ND	50	µg/kg
PCB-1221	ND	50	µg/kg
PCB-1232	ND	50	µg/kg
PCB-1242	ND	50	µg/kg
PCB-1248	ND	50	µg/kg
PCB-1254	ND	50	µg/kg
PCB-1260	ND	50	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Volatile Organic Compounds - EPA Method 8240/624

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD1
SPECTRALYTIX Sample ID: MET92-001-92050671 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed: 05/28/92

Analyte	Result	Detection Limit	Units
Chloromethane	ND	10	µg/kg
Bromomethane	ND	10	µg/kg
Vinyl Chloride	ND	10	µg/kg
Chloroethane	ND	10	µg/kg
Methylene Chloride	ND	10	µg/kg
Acetone	ND	10	µg/kg
Carbon Disulfide	ND	10	µg/kg
1,1-Dichloroethene	ND	10	µg/kg
1,1-Dichloroethane	ND	10	µg/kg
1,2-Dichloroethenes, total	ND	10	µg/kg
Chloroform	ND	10	µg/kg
1,2-Dichloroethane	ND	10	µg/kg
2-Butanone	ND	10	µg/kg
1,1,1-Trichloroethane	ND	10	µg/kg
Carbon Tetrachloride	ND	10	µg/kg
Bromodichloromethane	ND	10	µg/kg
1,2-Dichloropropane	ND	10	µg/kg
Cis-1,3-Dichloropropene	ND	10	µg/kg
Trichloroethene	ND	10	µg/kg
Dibromochloromethane	ND	10	µg/kg
1,1,2-Trichloroethane	ND	10	µg/kg
Benzene	ND	10	µg/kg
Trans-1,3-Dichloropropene	ND	10	µg/kg
Bromoform	ND	10	µg/kg
4-Methyl-2-Pentanone	ND	10	µg/kg
2-Hexanone	ND	10	µg/kg
Tetrachloroethene	ND	10	µg/kg
1,1,2,2-Tetrachloroethane	ND	10	µg/kg
Toluene	ND	10	µg/kg
Chlorobenzene	ND	10	µg/kg
Ethylbenzene	ND	10	µg/kg
Styrene	ND	10	µg/kg
Xylenes, total	ND	10	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD1
SPECTRALYTIX Sample ID: MET92-001-92050671 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed : 05/30/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD1
SPECTRALYTIX Sample ID: MET92-001-92050671 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Extracted: 05/29/92 Date Analyzed: 06/04/92

Analyte	Result	Detection Limit	Units
Phenol	ND	330	µg/kg
Bis(2-Chloroethyl) Ether	ND	330	µg/kg
2-Chlorophenol	ND	330	µg/kg
1,3-Dichlorobenzene	ND	330	µg/kg
1,4-Dichlorobenzene	ND	330	µg/kg
1,2-Dichlorobenzene	ND	330	µg/kg
2-Methylphenol	ND	330	µg/kg
2,2'-Oxybis-(1-chloropropane)	ND	330	µg/kg
4-Methylphenol	ND	330	µg/kg
N-Nitroso-di-n-propylamine	ND	330	µg/kg
Hexachloroethane	ND	330	µg/kg
Nitrobenzene	ND	330	µg/kg
Isophorone	ND	330	µg/kg
2-Nitrophenol	ND	330	µg/kg
2,4-Dimethylphenol	ND	330	µg/kg
Bis(2-Chloroethoxy)methane	ND	330	µg/kg
2,4-Dichlorophenol	ND	330	µg/kg
1,2,4-Trichlorobenzene	ND	330	µg/kg
Naphthalene	ND	330	µg/kg
4-Chloroaniline	ND	330	µg/kg
Hexachlorobutadiene	ND	330	µg/kg
4-Chloro-3-methylphenol	ND	330	µg/kg
2-Methylnaphthalene	ND	330	µg/kg
Hexachlorocyclopentadiene	ND	330	µg/kg
2,4,6-Trichlorophenol	ND	330	µg/kg
2,4,5-Trichlorophenol	ND	1,700	µg/kg
2-Chloronaphthalene	ND	330	µg/kg
2-Nitroaniline	ND	1,700	µg/kg
Dimethyl Phthalate	ND	330	µg/kg
Acenaphthylene	ND	330	µg/kg
3-Nitroaniline	ND	1,700	µg/kg
Acenaphthene	ND	330	µg/kg
2,4-Dinitrophenol	ND	1,700	µg/kg
4-Nitrophenol	ND	1,700	µg/kg
Dibenzofuran	ND	330	µg/kg

ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270
(continued)

SPECTRALYTIX Sample ID: MET92-001-92050671

Analyte	Result	Detection Limit	Units
2,4-Dinitrotoluene	ND	330	µg/kg
2,6-Dinitrotoluene	ND	330	µg/kg
Diethyl Phthalate	ND	330	µg/kg
4-Chlorophenyl Phenyl Ether	ND	330	µg/kg
Fluorene	ND	330	µg/kg
4-Nitroaniline	ND	1,700	µg/kg
4,6-Dinitro-2-methylphenol	ND	1,700	µg/kg
N-Nitrosodiphenylamine	ND	330	µg/kg
4-Bromophenyl Phenyl Ether	ND	330	µg/kg
Hexachlorobenzene	ND	330	µg/kg
Pentachlorophenol	ND	1,700	µg/kg
Phenanthrene	ND	330	µg/kg
Anthracene	ND	330	µg/kg
Carbazole	ND	330	µg/kg
Di-n-butyl Phthalate	ND	330	µg/kg
Fluoranthene	ND	330	µg/kg
Pyrene	ND	330	µg/kg
Butylbenzyl Phthalate	ND	330	µg/kg
3,3'-Dichlorobenzidine	ND	330	µg/kg
Benzo(a)anthracene	ND	330	µg/kg
Bis(2-Ethylhexyl) Phthalate	ND	330	µg/kg
Chrysene	ND	330	µg/kg
Di-n-octyl Phthalate	ND	330	µg/kg
Benzo(b)fluoranthene	ND	330	µg/kg
Benzo(k)fluoranthene	ND	330	µg/kg
Benzo(a)pyrene	ND	330	µg/kg
Indeno(1,2,3-cd)pyrene	ND	330	µg/kg
Dibenz(a,h)anthracene	ND	330	µg/kg
Benzo(g,h,i)perylene	ND	330	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9208043-08A
Client ID: WFF7-FT-SD1
Collected: 08/06/92
Dilution: 1

Matrix: SOIL
Method: SW846 8080
Units: ug/Kg

Analyst: AD
Analyzed: 08/12/92
Prepared: 08/11/92

GC TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
4,4'-DDD	BQL	4.10	
4,4'-DDE	BQL	1.49	
4,4'-DDT	BQL	4.46	
Aldrin	BQL	1.49	
alpha-BHC	BQL	1.12	
Aroclor 1016	BQL	18.6	
Aroclor 1221	BQL	18.6	
Aroclor 1232	BQL	18.6	
Aroclor 1242	BQL	24.2	
Aroclor 1248	BQL	37.2	
Aroclor 1254	BQL	37.2	
Aroclor 1260	BQL	37.2	
beta-BHC	BQL	2.23	
Chlordane	BQL	5.20	
delta-BHC	BQL	3.35	
Dieldrin	BQL	0.75	
Endosulfan I	BQL	5.20	
Endosulfan II	BQL	1.49	
Endosulfan sulfate	BQL	24.5	
Endrin	BQL	2.23	
Endrin aldehyde	BQL	8.56	
gamma-BHC (Lindane)	BQL	1.49	
Heptachlor	BQL	1.12	
Heptachlor epoxide	BQL	30.9	
Methoxychlor	BQL	65.4	
Toxaphene	BQL	89.2	

Total Metals

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD1
SPECTRALYTIX Sample ID: MET92-001-92050671 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92

Analyte	Result	Detection Limit	Units
Aluminum	1,400	10	mg/kg
Antimony	ND	0.50	mg/kg
Arsenic	ND	0.20	mg/kg
Barium	11	5.0	mg/kg
Berylium	ND	0.5	mg/kg
Cadmium	ND	1.0	mg/kg
Calcium	190	5.0	mg/kg
Chromium	ND	2.0	mg/kg
Cobalt	ND	2.5	mg/kg
Copper	ND	2.0	mg/kg
Iron	600	5.0	mg/kg
Lead	ND	5.0	mg/kg
Magnesium	14	5.0	mg/kg
Manganese	22	1.0	mg/kg
Mercury	ND	0.050	mg/kg
Nickel	ND	5.0	mg/kg
Potassium	77	5.0	mg/kg
Selenium	ND	0.20	mg/kg
Silver	ND	2.0	mg/kg
Sodium	13	5.0	mg/kg
Thallium	ND	0.50	mg/kg
Vanadium	ND	2.5	mg/kg
Zinc	ND	2.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Analyte not detected at or above the listed reporting limit.

Cyanides
Via EPA Method 335.3

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD1
SPECTRALYTIX Sample ID: MET92-001-92050671 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed : 06/03/92

Analyte	Result	Detection Limit	Units
Cyanide (CN)	ND	1	mg/kg

Units of mg/L are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Volatile Organic Compounds - EPA Method 8240/624

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD2
SPECTRALYTIX Sample ID: MET92-001-92050669 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed: 05/28/92

Analyte	Result	Detection Limit	Units
Chloromethane	ND	10	µg/kg
Bromomethane	ND	10	µg/kg
Vinyl Chloride	ND	10	µg/kg
Chloroethane	ND	10	µg/kg
Methylene Chloride	ND	10	µg/kg
Acetone	ND	10	µg/kg
Carbon Disulfide	ND	10	µg/kg
1,1-Dichloroethene	ND	10	µg/kg
1,1-Dichloroethane	ND	10	µg/kg
1,2-Dichloroethenes, total	ND	10	µg/kg
Chloroform	ND	10	µg/kg
1,2-Dichloroethane	ND	10	µg/kg
2-Butanone	ND	10	µg/kg
1,1,1-Trichloroethane	ND	10	µg/kg
Carbon Tetrachloride	ND	10	µg/kg
Bromodichloromethane	ND	10	µg/kg
1,2-Dichloropropane	ND	10	µg/kg
Cis-1,3-Dichloropropene	ND	10	µg/kg
Trichloroethene	ND	10	µg/kg
Dibromochloromethane	ND	10	µg/kg
1,1,2-Trichloroethane	ND	10	µg/kg
Benzene	ND	10	µg/kg
Trans-1,3-Dichloropropene	ND	10	µg/kg
Bromoform	ND	10	µg/kg
4-Methyl-2-Pentanone	ND	10	µg/kg
2-Hexanone	ND	10	µg/kg
Tetrachloroethene	ND	10	µg/kg
1,1,2,2-Tetrachloroethane	ND	10	µg/kg
Toluene	ND	10	µg/kg
Chlorobenzene	ND	10	µg/kg
Ethylbenzene	ND	10	µg/kg
Styrene	ND	10	µg/kg
Xylenes, total	ND	10	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD2
SPECTRALYTIX Sample ID: MET92-001-92050669 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed : 05/30/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD2
SPECTRALYTIX Sample ID: MET92-001-92050669 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Extracted: 05/29/92 Date Analyzed: 06/04/92

Analyte	Result	Detection Limit	Units
Phenol	ND	330	µg/kg
Bis(2-Chloroethyl) Ether	ND	330	µg/kg
2-Chlorophenol	ND	330	µg/kg
1,3-Dichlorobenzene	ND	330	µg/kg
1,4-Dichlorobenzene	ND	330	µg/kg
1,2-Dichlorobenzene	ND	330	µg/kg
2-Methylphenol	ND	330	µg/kg
2,2'-Oxybis-(1-chloropropane)	ND	330	µg/kg
4-Methylphenol	ND	330	µg/kg
N-Nitroso-di-n-propylamine	ND	330	µg/kg
Hexachloroethane	ND	330	µg/kg
Nitrobenzene	ND	330	µg/kg
Isophorone	ND	330	µg/kg
2-Nitrophenol	ND	330	µg/kg
2,4-Dimethylphenol	ND	330	µg/kg
Bis(2-Chloroethoxy)methane	ND	330	µg/kg
2,4-Dichlorophenol	ND	330	µg/kg
1,2,4-Trichlorobenzene	ND	330	µg/kg
Naphthalene	ND	330	µg/kg
4-Chloroaniline	ND	330	µg/kg
Hexachlorobutadiene	ND	330	µg/kg
4-Chloro-3-methylphenol	ND	330	µg/kg
2-Methylnaphthalene	ND	330	µg/kg
Hexachlorocyclopentadiene	ND	330	µg/kg
2,4,6-Trichlorophenol	ND	330	µg/kg
2,4,5-Trichlorophenol	ND	1,700	µg/kg
2-Chloronaphthalene	ND	330	µg/kg
2-Nitroaniline	ND	1,700	µg/kg
Dimethyl Phthalate	ND	330	µg/kg
Acenaphthylene	ND	330	µg/kg
3-Nitroaniline	ND	1,700	µg/kg
Acenaphthene	ND	330	µg/kg
2,4-Dinitrophenol	ND	1,700	µg/kg
4-Nitrophenol	ND	1,700	µg/kg
Dibenzofuran	ND	330	µg/kg

ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270
(continued)

SPECTRALYTIX Sample ID: MET92-001-92050669

Analyte	Result	Detection Limit	Units
2,4-Dinitrotoluene	ND	330	µg/kg
2,6-Dinitrotoluene	ND	330	µg/kg
Diethyl Phthalate	ND	330	µg/kg
4-Chlorophenyl Phenyl Ether	ND	330	µg/kg
Fluorene	ND	330	µg/kg
4-Nitroaniline	ND	1,700	µg/kg
4,6-Dinitro-2-methylphenol	ND	1,700	µg/kg
N-Nitrosodiphenylamine	ND	330	µg/kg
4-Bromophenyl Phenyl Ether	ND	330	µg/kg
Hexachlorobenzene	ND	330	µg/kg
Pentachlorophenol	ND	1,700	µg/kg
Phenanthrene	ND	330	µg/kg
Anthracene	ND	330	µg/kg
Carbazole	ND	330	µg/kg
Di-n-butyl Phthalate	ND	330	µg/kg
Fluoranthene	ND	330	µg/kg
Pyrene	ND	330	µg/kg
Butylbenzyl Phthalate	ND	330	µg/kg
3,3'-Dichlorobenzidine	ND	330	µg/kg
Benzo(a)anthracene	ND	330	µg/kg
Bis(2-Ethylhexyl) Phthalate	ND	330	µg/kg
Chrysene	ND	330	µg/kg
Di-n-octyl Phthalate	ND	330	µg/kg
Benzo(b)fluoranthene	ND	330	µg/kg
Benzo(k)fluoranthene	ND	330	µg/kg
Benzo(a)pyrene	ND	330	µg/kg
Indeno(1,2,3-cd)pyrene	ND	330	µg/kg
Dibenz(a,h)anthracene	ND	330	µg/kg
Benzo(g,h,i)perylene	ND	330	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9208043-09A
Client ID: WFF7-FT-SD2
Collected: 08/06/92
Dilution: 1

Matrix: SOIL
Method: SW846 8080
Units: ug/Kg

Analyst: AD
Analyzed: 08/12/92
Prepared: 08/11/92

GC TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
4,4'-DDD	BQL	4.06	
4,4'-DDE	4.94	1.47	
4,4'-DDT	BQL	4.42	
Aldrin	BQL	1.47	
alpha-BHC	BQL	1.11	
Aroclor 1016	BQL	18.4	
Aroclor 1221	BQL	18.4	
Aroclor 1232	BQL	18.4	
Aroclor 1242	BQL	24.0	
Aroclor 1248	BQL	36.8	
Aroclor 1254	BQL	36.8	
Aroclor 1260	BQL	36.8	
beta-BHC	BQL	2.21	
Chlordane	BQL	5.16	
delta-BHC	BQL	3.32	
Dieldrin	BQL	0.73	
Endosulfan I	BQL	5.16	
Endosulfan II	BQL	1.47	
Endosulfan sulfate	BQL	24.3	
Endrin	BQL	2.21	
Endrin aldehyde	BQL	8.48	
gamma-BHC (Lindane)	BQL	1.47	
Heptachlor	BQL	1.11	
Heptachlor epoxide	BQL	30.6	
Methoxychlor	BQL	64.8	
Toxaphene	BQL	88.4	

Total Metals

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD2
SPECTRALYTIX Sample ID: MET92-001-92050669 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92

Analyte	Result	Detection Limit	Units
Aluminum	1,100	10	mg/kg
Antimony	ND	0.50	mg/kg
Arsenic	ND	0.20	mg/kg
Barium	27	5.0	mg/kg
Berylium	ND	0.5	mg/kg
Cadmium	2.5	1.0	mg/kg
Calcium	160	5.0	mg/kg
Chromium	2.1	2.0	mg/kg
Cobalt	ND	2.5	mg/kg
Copper	130	2.0	mg/kg
Iron	580	5.0	mg/kg
Lead	ND	5.0	mg/kg
Magnesium	14	5.0	mg/kg
Manganese	27	1.0	mg/kg
Mercury	ND	0.050	mg/kg
Nickel	ND	5.0	mg/kg
Potassium	100	5.0	mg/kg
Selenium	ND	0.20	mg/kg
Silver	2.6	2.0	mg/kg
Sodium	18	5.0	mg/kg
Thallium	ND	0.50	mg/kg
Vanadium	ND	2.5	mg/kg
Zinc	150	2.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Analyte not detected at or above the listed reporting limit.

Cyanides
Via EPA Method 335.3

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD2
SPECTRALYTIX Sample ID: MET92-001-92050669 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed : 06/03/92

Analyte	Result	Detection Limit	Units
Cyanide (CN)	ND	1	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Volatile Organic Compounds - EPA Method 8240/624

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7FT-SD3
SPECTRALYTIX Sample ID: MET92-002-92050754 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed: 05/29/92

Analyte	Result	Detection Limit	Units
Chloromethane	ND	10	µg/kg
Bromomethane	ND	10	µg/kg
Vinyl Chloride	ND	10	µg/kg
Chloroethane	ND	10	µg/kg
Methylene Chloride	ND	10	µg/kg
Acetone	ND	10	µg/kg
Carbon Disulfide	ND	10	µg/kg
1,1-Dichloroethene	ND	10	µg/kg
1,1-Dichloroethane	ND	10	µg/kg
1,2-Dichloroethenes, total	ND	10	µg/kg
Chloroform	ND	10	µg/kg
1,2-Dichloroethane	ND	10	µg/kg
2-Butanone	ND	10	µg/kg
1,1,1-Trichloroethane	ND	10	µg/kg
Carbon Tetrachloride	ND	10	µg/kg
Bromodichloromethane	ND	10	µg/kg
1,2-Dichloropropane	ND	10	µg/kg
Cis-1,3-Dichloropropene	ND	10	µg/kg
Trichloroethene	ND	10	µg/kg
Dibromochloromethane	ND	10	µg/kg
1,1,2-Trichloroethane	ND	10	µg/kg
Benzene	ND	10	µg/kg
Trans-1,3-Dichloropropene	ND	10	µg/kg
Bromoform	ND	10	µg/kg
4-Methyl-2-Pentanone	ND	10	µg/kg
2-Hexanone	ND	10	µg/kg
Tetrachloroethene	ND	10	µg/kg
1,1,2,2-Tetrachloroethane	ND	10	µg/kg
Toluene	ND	10	µg/kg
Chlorobenzene	ND	10	µg/kg
Ethylbenzene	ND	10	µg/kg
Styrene	ND	10	µg/kg
Xylenes, total	ND	10	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7FT-SD3
SPECTRALYTIX Sample ID: MET92-002-92050754 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed : 05/30/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7FT-SD3
SPECTRALYTIX Sample ID: MET92-002-92050754 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Extracted: 05/29/92 Date Analyzed: 06/05/92

Analyte	Result	Detection Limit	Units
Phenol	ND	330	µg/kg
Bis(2-Chloroethyl) Ether	ND	330	µg/kg
2-Chlorophenol	ND	330	µg/kg
1,3-Dichlorobenzene	ND	330	µg/kg
1,4-Dichlorobenzene	ND	330	µg/kg
1,2-Dichlorobenzene	ND	330	µg/kg
2-Methylphenol	ND	330	µg/kg
2,2'-Oxybis-(1-chloropropane)	ND	330	µg/kg
4-Methylphenol	ND	330	µg/kg
N-Nitroso-di-n-propylamine	ND	330	µg/kg
Hexachloroethane	ND	330	µg/kg
Nitrobenzene	ND	330	µg/kg
Isophorone	ND	330	µg/kg
2-Nitrophenol	ND	330	µg/kg
2,4-Dimethylphenol	ND	330	µg/kg
Bis(2-Chloroethoxy)methane	ND	330	µg/kg
2,4-Dichlorophenol	ND	330	µg/kg
1,2,4-Trichlorobenzene	ND	330	µg/kg
Naphthalene	ND	330	µg/kg
4-Chloroaniline	ND	330	µg/kg
Hexachlorobutadiene	ND	330	µg/kg
4-Chloro-3-methylphenol	ND	330	µg/kg
2-Methylnaphthalene	ND	330	µg/kg
Hexachlorocyclopentadiene	ND	330	µg/kg
2,4,6-Trichlorophenol	ND	330	µg/kg
2,4,5-Trichlorophenol	ND	1,700	µg/kg
2-Chloronaphthalene	ND	330	µg/kg
2-Nitroaniline	ND	1,700	µg/kg
Dimethyl Phthalate	ND	330	µg/kg
Acenaphthylene	ND	330	µg/kg
3-Nitroaniline	ND	1,700	µg/kg
Acenaphthene	ND	330	µg/kg
2,4-Dinitrophenol	ND	1,700	µg/kg
4-Nitrophenol	ND	1,700	µg/kg
Dibenzofuran	ND	330	µg/kg

ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270
(continued)

SPECTRALYTIX Sample ID: MET92-002-92050754

Analyte	Result	Detection Limit	Units
2,4-Dinitrotoluene	ND	330	µg/kg
2,6-Dinitrotoluene	ND	330	µg/kg
Diethyl Phthalate	ND	330	µg/kg
4-Chlorophenyl Phenyl Ether	ND	330	µg/kg
Fluorene	ND	330	µg/kg
4-Nitroaniline	ND	1,700	µg/kg
4,6-Dinitro-2-methylphenol	ND	1,700	µg/kg
N-Nitrosodiphenylamine	ND	330	µg/kg
4-Bromophenyl Phenyl Ether	ND	330	µg/kg
Hexachlorobenzene	ND	330	µg/kg
Pentachlorophenol	ND	1,700	µg/kg
Phenanthrene	ND	330	µg/kg
Anthracene	ND	330	µg/kg
Carbazole	ND	330	µg/kg
Di-n-butyl Phthalate	ND	330	µg/kg
Fluoranthene	ND	330	µg/kg
Pyrene	ND	330	µg/kg
Butylbenzyl Phthalate	ND	330	µg/kg
3,3'-Dichlorobenzidine	ND	330	µg/kg
Benzo(a)anthracene	ND	330	µg/kg
Bis(2-Ethylhexyl) Phthalate	ND	330	µg/kg
Chrysene	ND	330	µg/kg
Di-n-octyl Phthalate	ND	330	µg/kg
Benzo(b)fluoranthene	ND	330	µg/kg
Benzo(k)fluoranthene	ND	330	µg/kg
Benzo(a)pyrene	ND	330	µg/kg
Indeno(1,2,3-cd)pyrene	ND	330	µg/kg
Dibenz(a,h)anthracene	ND	330	µg/kg
Benzo(g,h,i)perylene	ND	330	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9208043-10A
Client ID: WFF7-FT-SD3
Collected: 08/06/92
Dilution: 1

Matrix: SOIL
Method: SW846 8080
Units: ug/Kg

Analyst: AD
Analyzed: 08/13/92
Prepared: 08/11/92

GC TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
4,4'-DDD	BQL	4.13	
4,4'-DDE	2.00	1.50	
4,4'-DDT	BQL	4.50	
Aldrin	BQL	1.50	
alpha-BHC	BQL	1.13	
Aroclor 1016	BQL	18.8	
Aroclor 1221	BQL	18.8	
Aroclor 1232	BQL	18.8	
Aroclor 1242	BQL	24.4	
Aroclor 1248	BQL	37.5	
Aroclor 1254	BQL	37.5	
Aroclor 1260	BQL	37.5	
beta-BHC	BQL	2.25	
Chlordane	BQL	5.25	
delta-BHC	BQL	3.38	
Dieldrin	BQL	0.75	
Endosulfan I	BQL	5.25	
Endosulfan II	BQL	1.50	
Endosulfan sulfate	BQL	24.8	
Endrin	BQL	2.25	
Endrin aldehyde	BQL	8.64	
gamma-BHC (Lindane)	BQL	1.50	
Heptachlor	BQL	1.13	
Heptachlor epoxide	BQL	31.1	
Methoxychlor	BQL	66.0	
Toxaphene	BQL	90.0	

Total Metals

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7FT-SD3
SPECTRALYTIX Sample ID: MET92-002-92050754 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Aluminum	2,300	10	mg/kg
Antimony	ND	0.50	mg/kg
Arsenic	0.54	0.20	mg/kg
Barium	10	5.0	mg/kg
Berylium	ND	0.50	mg/kg
Cadmium	1.3	1.0	mg/kg
Calcium	92	5.0	mg/kg
Chromium	2.3	2.0	mg/kg
Cobalt	ND	2.5	mg/kg
Copper	15	2.0	mg/kg
Iron	1,600	5.0	mg/kg
Lead	9.1	5.0	mg/kg
Magnesium	6.1	5.0	mg/kg
Manganese	17	1.0	mg/kg
Mercury	ND	0.050	mg/kg
Nickel	ND	2.5	mg/kg
Potassium	77	5.0	mg/kg
Selenium	ND	0.20	mg/kg
Silver	ND	2.0	mg/kg
Sodium	6.4	0.50	mg/kg
Thallium	ND	0.50	mg/kg
Vanadium	5.4	2.5	mg/kg
Zinc	5.9	2.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Analyte not detected at or above the listed reporting limit.

Cyanides
Via EPA Method 335.3

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7FT-SD3
SPECTRALYTIX Sample ID: MET92-002-92050754 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed : 06/03/92

Analyte	Result	Detection Limit	Units
Cyanide (CN)	ND	1	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Volatile Organic Compounds - EPA Method 8240/624

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD4
SPECTRALYTIX Sample ID: MET92-001-92050670 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed: 05/28/92

Analyte	Result	Detection Limit	Units
Chloromethane	ND	10	µg/kg
Bromomethane	ND	10	µg/kg
Vinyl Chloride	ND	10	µg/kg
Chloroethane	ND	10	µg/kg
Methylene Chloride	ND	10	µg/kg
Acetone	ND	10	µg/kg
Carbon Disulfide	ND	10	µg/kg
1,1-Dichloroethene	ND	10	µg/kg
1,1-Dichloroethane	ND	10	µg/kg
1,2-Dichloroethenes, total	ND	10	µg/kg
Chloroform	ND	10	µg/kg
1,2-Dichloroethane	ND	10	µg/kg
2-Butanone	ND	10	µg/kg
1,1,1-Trichloroethane	ND	10	µg/kg
Carbon Tetrachloride	ND	10	µg/kg
Bromodichloromethane	ND	10	µg/kg
1,2-Dichloropropane	ND	10	µg/kg
Cis-1,3-Dichloropropene	ND	10	µg/kg
Trichloroethene	ND	10	µg/kg
Dibromochloromethane	ND	10	µg/kg
1,1,2-Trichloroethane	ND	10	µg/kg
Benzene	ND	10	µg/kg
Trans-1,3-Dichloropropene	ND	10	µg/kg
Bromoform	ND	10	µg/kg
4-Methyl-2-Pentanone	ND	10	µg/kg
2-Hexanone	ND	10	µg/kg
Tetrachloroethene	ND	10	µg/kg
1,1,2,2-Tetrachloroethane	ND	10	µg/kg
Toluene	ND	10	µg/kg
Chlorobenzene	ND	10	µg/kg
Ethylbenzene	ND	10	µg/kg
Styrene	ND	10	µg/kg
Xylenes, total	ND	10	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD4
SPECTRALYTIX Sample ID: MET92-001-92050670 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed : 05/30/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD4
SPECTRALYTIX Sample ID: MET92-001-92050670 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Extracted: 05/29/92 Date Analyzed: 06/04/92

Analyte	Result	Detection Limit	Units
Phenol	ND	330	µg/kg
Bis(2-Chloroethyl) Ether	ND	330	µg/kg
2-Chlorophenol	ND	330	µg/kg
1,3-Dichlorobenzene	ND	330	µg/kg
1,4-Dichlorobenzene	ND	330	µg/kg
1,2-Dichlorobenzene	ND	330	µg/kg
2-Methylphenol	ND	330	µg/kg
2,2'-Oxybis-(1-chloropropane)	ND	330	µg/kg
4-Methylphenol	ND	330	µg/kg
N-Nitroso-di-n-propylamine	ND	330	µg/kg
Hexachloroethane	ND	330	µg/kg
Nitrobenzene	ND	330	µg/kg
Isophorone	ND	330	µg/kg
2-Nitrophenol	ND	330	µg/kg
2,4-Dimethylphenol	ND	330	µg/kg
Bis(2-Chloroethoxy)methane	ND	330	µg/kg
2,4-Dichlorophenol	ND	330	µg/kg
1,2,4-Trichlorobenzene	ND	330	µg/kg
Naphthalene	ND	330	µg/kg
4-Chloroaniline	ND	330	µg/kg
Hexachlorobutadiene	ND	330	µg/kg
4-Chloro-3-methylphenol	ND	330	µg/kg
2-Methylnaphthalene	ND	330	µg/kg
Hexachlorocyclopentadiene	ND	330	µg/kg
2,4,6-Trichlorophenol	ND	330	µg/kg
2,4,5-Trichlorophenol	ND	1,700	µg/kg
2-Chloronaphthalene	ND	330	µg/kg
2-Nitroaniline	ND	1,700	µg/kg
Dimethyl Phthalate	ND	330	µg/kg
Acenaphthylene	ND	330	µg/kg
3-Nitroaniline	ND	1,700	µg/kg
Acenaphthene	ND	330	µg/kg
2,4-Dinitrophenol	ND	1,700	µg/kg
4-Nitrophenol	ND	1,700	µg/kg
Dibenzofuran	ND	330	µg/kg

ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270
(continued)

SPECTRALYTIX Sample ID: MET92-001-92050670

Analyte	Result	Detection Limit	Units
2,4-Dinitrotoluene	ND	330	µg/kg
2,6-Dinitrotoluene	ND	330	µg/kg
Diethyl Phthalate	ND	330	µg/kg
4-Chlorophenyl Phenyl Ether	ND	330	µg/kg
Fluorene	ND	330	µg/kg
4-Nitroaniline	ND	1,700	µg/kg
4,6-Dinitro-2-methylphenol	ND	1,700	µg/kg
N-Nitrosodiphenylamine	ND	330	µg/kg
4-Bromophenyl Phenyl Ether	ND	330	µg/kg
Hexachlorobenzene	ND	330	µg/kg
Pentachlorophenol	ND	1,700	µg/kg
Phenanthrene	ND	330	µg/kg
Anthracene	ND	330	µg/kg
Carbazole	ND	330	µg/kg
Di-n-butyl Phthalate	ND	330	µg/kg
Fluoranthene	ND	330	µg/kg
Pyrene	ND	330	µg/kg
Butylbenzyl Phthalate	ND	330	µg/kg
3,3'-Dichlorobenzidine	ND	330	µg/kg
Benzo(a)anthracene	ND	330	µg/kg
Bis(2-Ethylhexyl) Phthalate	ND	330	µg/kg
Chrysene	ND	330	µg/kg
Di-n-octyl Phthalate	ND	330	µg/kg
Benzo(b)fluoranthene	ND	330	µg/kg
Benzo(k)fluoranthene	ND	330	µg/kg
Benzo(a)pyrene	ND	330	µg/kg
Indeno(1,2,3-cd)pyrene	ND	330	µg/kg
Dibenz(a,h)anthracene	ND	330	µg/kg
Benzo(g,h,i)perylene	ND	330	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9208043-11A
Client ID: WFF7-FT-SD4
Collected: 08/06/92
Dilution: 1

Matrix: SOIL
Method: SW846 8080
Units: ug/Kg

Analyst: AD
Analyzed: 08/12/92
Prepared: 08/11/92

GC TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
4,4'-DDD	BQL	4.28	
4,4'-DDE	7.24	1.55	
4,4'-DDT	2.29	4.66	J
Aldrin	BQL	1.55	
alpha-BHC	BQL	1.17	
Aroclor 1016	BQL	19.4	
Aroclor 1221	BQL	19.4	
Aroclor 1232	BQL	19.4	
Aroclor 1242	BQL	25.3	
Aroclor 1248	BQL	38.9	
Aroclor 1254	BQL	38.9	
Aroclor 1260	BQL	38.9	
beta-BHC	BQL	2.33	
Chlordane	BQL	5.44	
delta-BHC	BQL	3.50	
Dieldrin	BQL	0.77	
Endosulfan I	BQL	5.44	
Endosulfan II	BQL	1.55	
Endosulfan sulfate	BQL	25.6	
Endrin	BQL	2.33	
Endrin aldehyde	BQL	8.94	
gamma-BHC (Lindane)	BQL	1.55	
Heptachlor	BQL	1.17	
Heptachlor epoxide	BQL	32.2	
Methoxychlor	BQL	68.4	
Toxaphene	BQL	93.3	

Total Metals

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD4
SPECTRALYTIX Sample ID: MET92-001-92050670 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92

Analyte	Result	Detection Limit	Units
Aluminum	1,600	10	mg/kg
Antimony	ND	0.50	mg/kg
Arsenic	ND	0.20	mg/kg
Barium	24	5.0	mg/kg
Berylium	ND	0.5	mg/kg
Cadmium	1.6	1.0	mg/kg
Calcium	160	5.0	mg/kg
Chromium	ND	2.0	mg/kg
Cobalt	ND	2.5	mg/kg
Copper	110	2.0	mg/kg
Iron	510	5.0	mg/kg
Lead	ND	5.0	mg/kg
Magnesium	15	5.0	mg/kg
Manganese	37	1.0	mg/kg
Mercury	ND	0.050	mg/kg
Nickel	ND	5.0	mg/kg
Potassium	83	5.0	mg/kg
Selenium	ND	0.20	mg/kg
Silver	ND	2.0	mg/kg
Sodium	5.5	5.0	mg/kg
Thallium	ND	0.50	mg/kg
Vanadium	ND	2.5	mg/kg
Zinc	82	2.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Analyte not detected at or above the listed reporting limit.

Cyanides
Via EPA Method 335.3

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7FT-SD4
SPECTRALYTIX Sample ID: MET92-001-92050670 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed : 06/03/92

Analyte	Result	Detection Limit	Units
Cyanide (CN)	ND	1	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Volatile Organic Compounds - EPA Method 8240/624

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7BA-SW1
SPECTRALYTIX Sample ID: MET92-002-92050747 Sample Type: Water
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Analyzed: 05/29/92

Analyte	Result	Detection Limit	Units
Chloromethane	ND	10	µg/L
Bromomethane	ND	10	µg/L
Vinyl Chloride	ND	10	µg/L
Chloroethane	ND	10	µg/L
Methylene Chloride	ND	10	µg/L
Acetone	ND	10	µg/L
Carbon Disulfide	ND	10	µg/L
1,1-Dichloroethene	ND	10	µg/L
1,1-Dichloroethane	ND	10	µg/L
1,2-Dichloroethenes, total	ND	10	µg/L
Chloroform	ND	10	µg/L
1,2-Dichloroethane	ND	10	µg/L
2-Butanone	ND	10	µg/L
1,1,1-Trichloroethane	ND	10	µg/L
Carbon Tetrachloride	ND	10	µg/L
Bromodichloromethane	ND	10	µg/L
1,2-Dichloropropane	ND	10	µg/L
Cis-1,3-Dichloropropene	ND	10	µg/L
Trichloroethene	ND	10	µg/L
Dibromochloromethane	ND	10	µg/L
1,1,2-Trichloroethane	ND	10	µg/L
Benzene	ND	10	µg/L
Trans-1,3-Dichloropropene	ND	10	µg/L
Bromoform	ND	10	µg/L
4-Methyl-2-Pentanone	ND	10	µg/L
2-Hexanone	ND	10	µg/L
Tetrachloroethene	ND	10	µg/L
1,1,2,2-Tetrachloroethane	ND	10	µg/L
Toluene	ND	10	µg/L
Chlorobenzene	ND	10	µg/L
Ethylbenzene	ND	10	µg/L
Styrene	ND	10	µg/L
Xylenes, total	ND	10	µg/L

Units of µg/L are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7BA-SW1
SPECTRALYTIX Sample ID: MET92-002-92050747 Sample Type: Water
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Analyzed : 05/29/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/L

Units of mg/L are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9208043-03A
Client ID: WFF7AF-SW1
Collected: 08/07/92
Dilution: 1

Matrix: WATER
Method: 40CFR136 624
Units: ug/L

Analyst: YY
Analyzed: 08/12/92
Prepared:

VOLATILE TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
1,1,1-Trichloroethane	BQL	5.00	
1,1,2,2-Tetrachloroethane	BQL	5.00	
1,1,2-Trichloroethane	BQL	5.00	
1,1-Dichloroethane	BQL	5.00	
1,1-Dichloroethene	BQL	5.00	
1,2-Dichlorobenzene	BQL	10.0	
1,2-Dichloroethane	BQL	5.00	
1,2-Dichloropropane	BQL	5.00	
1,3-Dichlorobenzene	BQL	10.0	
1,4-Dichlorobenzene	BQL	10.0	
2-Chloroethylvinyl ether	BQL	10.0	
Benzene	BQL	5.00	
Bromodichloromethane	BQL	5.00	
Bromoform	BQL	5.00	
Bromomethane	BQL	10.0	
Carbon Tetrachloride	BQL	5.00	
Chlorobenzene	BQL	5.00	
Chloroethane	BQL	10.0	
Chloroform	BQL	5.00	
Chloromethane	BQL	10.0	
cis-1,3-Dichloropropene	BQL	5.00	
Dibromochloromethane	BQL	5.00	
Ethyl Benzene	BQL	5.00	
Methylene Chloride	1.63	5.00	J
Tetrachloroethene	BQL	5.00	
Toluene	BQL	5.00	
trans-1,2-Dichloroethene	BQL	5.00	
trans-1,3-Dichloropropene	BQL	5.00	
Trichloroethene	1.46	5.00	J
Trichlorofluoromethane	BQL	10.0	
Vinyl Chloride	BQL	10.0	

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7BA-SW1
SPECTRALYTIX Sample ID: MET92-002-92050747 Sample Type: Water
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Extracted: 05/27/92 Date Analyzed: 06/09/92

Analyte	Result	Detection Limit	Units
Phenol	ND	10	µg/L
Bis(2-Chloroethyl) Ether	ND	10	µg/L
2-Chlorophenol	ND	10	µg/L
1,3-Dichlorobenzene	ND	10	µg/L
1,4-Dichlorobenzene	ND	10	µg/L
1,2-Dichlorobenzene	ND	10	µg/L
2-Methylphenol	ND	10	µg/L
2,2'-Oxybis-(1-chloropropane)	ND	10	µg/L
4-Methylphenol	ND	10	µg/L
N-Nitroso-di-n-propylamine	ND	10	µg/L
Hexachloroethane	ND	10	µg/L
Nitrobenzene	ND	10	µg/L
Isophorone	ND	10	µg/L
2-Nitrophenol	ND	10	µg/L
2,4-Dimethylphenol	ND	10	µg/L
Bis(2-Chloroethoxy)methane	ND	10	µg/L
2,4-Dichlorophenol	ND	10	µg/L
1,2,4-Trichlorobenzene	ND	10	µg/L
Naphthalene	ND	10	µg/L
4-Chloroaniline	ND	10	µg/L
Hexachlorobutadiene	ND	10	µg/L
4-Chloro-3-methylphenol	ND	10	µg/L
2-Methylnaphthalene	ND	10	µg/L
Hexachlorocyclopentadiene	ND	10	µg/L
2,4,6-Trichlorophenol	ND	10	µg/L
2,4,5-Trichlorophenol	ND	50	µg/L
2-Chloronaphthalene	ND	10	µg/L
2-Nitroaniline	ND	50	µg/L
Dimethyl Phthalate	ND	10	µg/L
Acenaphthylene	ND	10	µg/L
3-Nitroaniline	ND	50	µg/L
Acenaphthene	ND	10	µg/L
2,4-Dinitrophenol	ND	50	µg/L
4-Nitrophenol	ND	50	µg/L
Dibenzofuran	ND	10	µg/L

ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270
(continued)

SPECTRALYTIX Sample ID: MET92-002-92050747

Analyte	Result	Detection Limit	Units
2,4-Dinitrotoluene	ND	10	µg/L
2,6-Dinitrotoluene	ND	10	µg/L
Diethyl Phthalate	ND	10	µg/L
4-Chlorophenyl Phenyl Ether	ND	10	µg/L
Fluorene	ND	10	µg/L
4-Nitroaniline	ND	50	µg/L
4,6-Dinitro-2-methylphenol	ND	50	µg/L
N-Nitrosodiphenylamine	ND	10	µg/L
4-Bromophenyl Phenyl Ether	ND	10	µg/L
Hexachlorobenzene	ND	10	µg/L
Pentachlorophenol	ND	50	µg/L
Phenanthrene	ND	10	µg/L
Anthracene	ND	10	µg/L
Carbazole	ND	10	µg/L
Di-n-butyl Phthalate	ND	10	µg/L
Fluoranthene	ND	10	µg/L
Pyrene	ND	10	µg/L
Butylbenzyl Phthalate	ND	10	µg/L
3,3'-Dichlorobenzidine	ND	10	µg/L
Benzo(a)anthracene	ND	10	µg/L
Bis(2-Ethylhexyl) Phthalate	ND	10	µg/L
Chrysene	ND	10	µg/L
Di-n-octyl Phthalate	ND	10	µg/L
Benzo(b)fluoranthene	ND	10	µg/L
Benzo(k)fluoranthene	ND	10	µg/L
Benzo(a)pyrene	ND	10	µg/L
Indeno(1,2,3-cd)pyrene	ND	10	µg/L
Dibenz(a,h)anthracene	ND	10	µg/L
Benzo(g,h,i)perylene	ND	10	µg/L

Units of µg/L are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Organochlorine Pesticides/PCB's
EPA Method 8080

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7BA-SW1
SPECTRALYTIX Sample ID: MET92-002-92050747 Sample Type: Water
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Extracted: 05/28/92 Date Analyzed: 06/02/92

Analyte	Result	Detection Limit	Units
alpha-BHC	ND	0.05	µg/L
beta-BHC	ND	0.05	µg/L
delta-BHC	ND	0.05	µg/L
gamma-BHC (Lindane)	ND	0.05	µg/L
Heptachlor	ND	0.05	µg/L
Aldrin	ND	0.05	µg/L
Heptachlor epoxide	ND	0.05	µg/L
gamma-Chlordane	ND	0.05	µg/L
Endosulfan I	ND	0.05	µg/L
alpha-Chlordane	ND	0.05	µg/L
Dieldrin	ND	0.1	µg/L
4,4'-DDE	ND	0.1	µg/L
Endrin	ND	0.1	µg/L
Endosulfan II	ND	0.1	µg/L
4,4'-DDD	ND	0.1	µg/L
Endosulfin sulfate	ND	0.1	µg/L
4,4'-DDT	ND	0.1	µg/L
Endrin ketone	ND	0.1	µg/L
Endrin aldehyde	ND	0.1	µg/L
Methoxychlor	ND	0.5	µg/L
Toxaphene	ND	5.0	µg/L
PCB-1016	ND	1.0	µg/L
PCB-1221	ND	1.0	µg/L
PCB-1232	ND	1.0	µg/L
PCB-1242	ND	1.0	µg/L
PCB-1248	ND	1.0	µg/L
PCB-1254	ND	1.0	µg/L
PCB-1260	ND	1.0	µg/L

Units of µg/L are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Metals

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7BA-SW1
SPECTRALYTIX Sample ID: MET92-002-92050747 Sample Type: Water
Date Sampled : 05/21/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Aluminum	ND	0.10	mg/L
Antimony	ND	0.0050	mg/L
Arsenic	ND	0.0020	mg/L
Barium	ND	0.050	mg/L
Berylium	ND	0.005	mg/L
Cadmium	ND	0.010	mg/L
Calcium	190	0.050	mg/L
Chromium	ND	0.020	mg/L
Cobalt	ND	0.025	mg/L
Copper	0.033	0.020	mg/L
Iron	0.16	0.050	mg/L
Lead	ND	0.050	mg/L
Magnesium	57	0.050	mg/L
Manganese	0.027	0.010	mg/L
Mercury	ND	0.00050	mg/L
Nickel	ND	0.025	mg/L
Potassium	200	0.050	mg/L
Selenium	ND	0.0020	mg/L
Silver	ND	0.020	mg/L
Sodium	4,800	0.050	mg/L
Thallium	ND	0.0050	mg/L
Vanadium	ND	0.025	mg/L
Zinc	ND	0.020	mg/L

Units of mg/L are equivalent to ppm.
ND = Analyte not detected at or above the listed reporting limit.

EPA-CLP Target Compound List
Volatile Organic Compounds - EPA Method 8240/624

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7BA-SD1
SPECTRALYTIX Sample ID: MET92-002-92050748 Sample Type: Soil
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Analyzed: 05/28/92

Analyte	Result	Detection Limit	Units
Chloromethane	ND	10	µg/kg
Bromomethane	ND	10	µg/kg
Vinyl Chloride	ND	10	µg/kg
Chloroethane	ND	10	µg/kg
Methylene Chloride	ND	10	µg/kg
Acetone	ND	10	µg/kg
Carbon Disulfide	ND	10	µg/kg
1,1-Dichloroethene	ND	10	µg/kg
1,1-Dichloroethane	ND	10	µg/kg
1,2-Dichloroethenes, total	ND	10	µg/kg
Chloroform	ND	10	µg/kg
1,2-Dichloroethane	ND	10	µg/kg
2-Butanone	ND	10	µg/kg
1,1,1-Trichloroethane	ND	10	µg/kg
Carbon Tetrachloride	ND	10	µg/kg
Bromodichloromethane	ND	10	µg/kg
1,2-Dichloropropane	ND	10	µg/kg
Cis-1,3-Dichloropropene	ND	10	µg/kg
Trichloroethene	ND	10	µg/kg
Dibromochloromethane	ND	10	µg/kg
1,1,2-Trichloroethane	ND	10	µg/kg
Benzene	ND	10	µg/kg
Trans-1,3-Dichloropropene	ND	10	µg/kg
Bromoform	ND	10	µg/kg
4-Methyl-2-Pentanone	ND	10	µg/kg
2-Hexanone	ND	10	µg/kg
Tetrachloroethene	ND	10	µg/kg
1,1,2,2-Tetrachloroethane	ND	10	µg/kg
Toluene	ND	10	µg/kg
Chlorobenzene	ND	10	µg/kg
Ethylbenzene	ND	10	µg/kg
Styrene	ND	10	µg/kg
Xylenes, total	ND	10	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7BA-SD1
SPECTRALYTIX Sample ID: MET92-002-92050748 Sample Type: Soil
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Analyzed : 05/29/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7BA-SD1
SPECTRALYTIX Sample ID: MET92-002-92050748 Sample Type: Soil
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Extracted: 05/29/92 Date Analyzed: 06/05/92

Analyte	Result	Detection Limit	Units
Phenol	ND	330	µg/kg
Bis(2-Chloroethyl) Ether	ND	330	µg/kg
2-Chlorophenol	ND	330	µg/kg
1,3-Dichlorobenzene	ND	330	µg/kg
1,4-Dichlorobenzene	ND	330	µg/kg
1,2-Dichlorobenzene	ND	330	µg/kg
2-Methylphenol	ND	330	µg/kg
2,2'-Oxybis-(1-chloropropane)	ND	330	µg/kg
4-Methylphenol	ND	330	µg/kg
N-Nitroso-di-n-propylamine	ND	330	µg/kg
Hexachloroethane	ND	330	µg/kg
Nitrobenzene	ND	330	µg/kg
Isophorone	ND	330	µg/kg
2-Nitrophenol	ND	330	µg/kg
2,4-Dimethylphenol	ND	330	µg/kg
Bis(2-Chloroethoxy)methane	ND	330	µg/kg
2,4-Dichlorophenol	ND	330	µg/kg
1,2,4-Trichlorobenzene	ND	330	µg/kg
Naphthalene	ND	330	µg/kg
4-Chloroaniline	ND	330	µg/kg
Hexachlorobutadiene	ND	330	µg/kg
4-Chloro-3-methylphenol	ND	330	µg/kg
2-Methylnaphthalene	ND	330	µg/kg
Hexachlorocyclopentadiene	ND	330	µg/kg
2,4,6-Trichlorophenol	ND	330	µg/kg
2,4,5-Trichlorophenol	ND	1,700	µg/kg
2-Chloronaphthalene	ND	330	µg/kg
2-Nitroaniline	ND	1,700	µg/kg
Dimethyl Phthalate	ND	330	µg/kg
Acenaphthylene	ND	330	µg/kg
3-Nitroaniline	ND	1,700	µg/kg
Acenaphthene	ND	330	µg/kg
2,4-Dinitrophenol	ND	1,700	µg/kg
4-Nitrophenol	ND	1,700	µg/kg
Dibenzofuran	ND	330	µg/kg

ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270
(continued)

SPECTRALYTIX Sample ID: MET92-002-92050748

Analyte	Result	Detection Limit	Units
2,4-Dinitrotoluene	ND	330	µg/kg
2,6-Dinitrotoluene	ND	330	µg/kg
Diethyl Phthalate	ND	330	µg/kg
4-Chlorophenyl Phenyl Ether	ND	330	µg/kg
Fluorene	ND	330	µg/kg
4-Nitroaniline	ND	1,700	µg/kg
4,6-Dinitro-2-methylphenol	ND	1,700	µg/kg
N-Nitrosodiphenylamine	ND	330	µg/kg
4-Bromophenyl Phenyl Ether	ND	330	µg/kg
Hexachlorobenzene	ND	330	µg/kg
Pentachlorophenol	ND	1,700	µg/kg
Phenanthrene	ND	330	µg/kg
Anthracene	ND	330	µg/kg
Carbazole	ND	330	µg/kg
Di-n-butyl Phthalate	ND	330	µg/kg
Fluoranthene	ND	330	µg/kg
Pyrene	ND	330	µg/kg
Butylbenzyl Phthalate	ND	330	µg/kg
3,3'-Dichlorobenzidine	ND	330	µg/kg
Benzo(a)anthracene	ND	330	µg/kg
Bis(2-Ethylhexyl) Phthalate	ND	330	µg/kg
Chrysene	ND	330	µg/kg
Di-n-octyl Phthalate	ND	330	µg/kg
Benzo(b)fluoranthene	ND	330	µg/kg
Benzo(k)fluoranthene	ND	330	µg/kg
Benzo(a)pyrene	ND	330	µg/kg
Indeno(1,2,3-cd)pyrene	ND	330	µg/kg
Dibenz(a,h)anthracene	ND	330	µg/kg
Benzo(g,h,i)perylene	ND	330	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9208043-06A
Client ID: WFF7BA-SD1
Collected: 08/07/92
Dilution: 1

Matrix: SOIL
Method: SW846 8080
Units: ug/Kg

Analyst: AD
Analyzed: 08/12/92
Prepared: 08/11/92

GC TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
4,4'-DDD	9.31	7.97	
4,4'-DDE	BQL	2.89	
4,4'-DDT	BQL	8.68	
Aldrin	BQL	2.89	
alpha-BHC	BQL	2.18	
Aroclor 1016	BQL	36.2	
Aroclor 1221	BQL	36.2	
Aroclor 1232	BQL	36.2	
Aroclor 1242	BQL	47.0	
Aroclor 1248	BQL	72.4	
Aroclor 1254	BQL	72.4	
Aroclor 1260	BQL	72.4	
beta-BHC	BQL	4.34	
Chlordane	BQL	10.1	
delta-BHC	BQL	6.52	
Dieldrin	BQL	1.45	
Endosulfan I	BQL	10.1	
Endosulfan II	BQL	2.89	
Endosulfan sulfate	BQL	47.8	
Endrin	BQL	4.34	
Endrin aldehyde	BQL	16.6	
gamma-BHC (Lindane)	BQL	2.89	
Heptachlor	BQL	2.18	
Heptachlor epoxide	BQL	60.1	
Methoxychlor	BQL	127.0	
Toxaphene	BQL	174.0	

Total Metals

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7BA-SD1
SPECTRALYTIX Sample ID: MET92-002-92050748 Sample Type: Soil
Date Sampled : 05/21/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Aluminum	2,300	10	mg/kg
Antimony	ND	0.50	mg/kg
Arsenic	2.2	0.20	mg/kg
Barium	ND	5.0	mg/kg
Berylium	ND	0.50	mg/kg
Cadmium	ND	1.0	mg/kg
Calcium	590	5.0	mg/kg
Chromium	5.4	2.0	mg/kg
Cobalt	ND	2.5	mg/kg
Copper	2.4	2.0	mg/kg
Iron	5,000	5.0	mg/kg
Lead	ND	5.0	mg/kg
Magnesium	650	5.0	mg/kg
Manganese	38	1.0	mg/kg
Mercury	ND	0.050	mg/kg
Nickel	ND	2.5	mg/kg
Potassium	730	5.0	mg/kg
Selenium	ND	0.20	mg/kg
Silver	ND	2.0	mg/kg
Sodium	54,000	0.50	mg/kg
Thallium	ND	0.50	mg/kg
Vanadium	5.9	2.5	mg/kg
Zinc	15	2.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Analyte not detected at or above the listed reporting limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7WO--SD1
SPECTRALYTIX Sample ID: MET92-001-92050672 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed : 05/30/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7WO-SB2
SPECTRALYTIX Sample ID: MET92-001-92050673 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed : 05/30/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7WO-SB3
SPECTRALYTIX Sample ID: MET92-001-92050674 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed : 05/30/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7WO-SB4
SPECTRALYTIX Sample ID: MET92-001-92050675 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed : 05/30/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7WO-SB5
SPECTRALYTIX Sample ID: MET92-001-92050676 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed : 05/30/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Volatile Organic Compounds - EPA Method 8240/624

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SD10
SPECTRALYTIX Sample ID: MET92-002-92050745 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/23/92
Date Analyzed: 06/01/92

Analyte	Result	Detection Limit	Units
Chloromethane	ND	10	µg/kg
Bromomethane	ND	10	µg/kg
Vinyl Chloride	ND	10	µg/kg
Chloroethane	ND	10	µg/kg
Methylene Chloride	ND	10	µg/kg
Acetone	ND	10	µg/kg
Carbon Disulfide	ND	10	µg/kg
1,1-Dichloroethene	ND	10	µg/kg
1,1-Dichloroethane	ND	10	µg/kg
1,2-Dichloroethenes, total	ND	10	µg/kg
Chloroform	ND	10	µg/kg
1,2-Dichloroethane	ND	10	µg/kg
2-Butanone	ND	10	µg/kg
1,1,1-Trichloroethane	ND	10	µg/kg
Carbon Tetrachloride	ND	10	µg/kg
Bromodichloromethane	ND	10	µg/kg
1,2-Dichloropropane	ND	10	µg/kg
Cis-1,3-Dichloropropene	ND	10	µg/kg
Trichloroethene	ND	10	µg/kg
Dibromochloromethane	ND	10	µg/kg
1,1,2-Trichloroethane	ND	10	µg/kg
Benzene	ND	10	µg/kg
Trans-1,3-Dichloropropene	ND	10	µg/kg
Bromoform	ND	10	µg/kg
4-Methyl-2-Pentanone	ND	10	µg/kg
2-Hexanone	ND	10	µg/kg
Tetrachloroethene	ND	10	µg/kg
1,1,2,2-Tetrachloroethane	ND	10	µg/kg
Toluene	ND	10	µg/kg
Chlorobenzene	ND	10	µg/kg
Ethylbenzene	ND	10	µg/kg
Styrene	ND	10	µg/kg
Xylenes, total	ND	10	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SD10
SPECTRALYTIX Sample ID: MET92-002-92050745 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/23/92
Date Analyzed : 05/29/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SD10
SPECTRALYTIX Sample ID: MET92-002-92050745 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/23/92
Date Extracted: 05/29/92 Date Analyzed: 06/05/92

Analyte	Result	Detection Limit	Units
Phenol	ND	330	µg/kg
Bis(2-Chloroethyl) Ether	ND	330	µg/kg
2-Chlorophenol	ND	330	µg/kg
1,3-Dichlorobenzene	ND	330	µg/kg
1,4-Dichlorobenzene	ND	330	µg/kg
1,2-Dichlorobenzene	ND	330	µg/kg
2-Methylphenol	ND	330	µg/kg
2,2'-Oxybis-(1-chloropropane)	ND	330	µg/kg
4-Methylphenol	ND	330	µg/kg
N-Nitroso-di-n-propylamine	ND	330	µg/kg
Hexachloroethane	ND	330	µg/kg
Nitrobenzene	ND	330	µg/kg
Isophorone	ND	330	µg/kg
2-Nitrophenol	ND	330	µg/kg
2,4-Dimethylphenol	ND	330	µg/kg
Bis(2-Chloroethoxy)methane	ND	330	µg/kg
2,4-Dichlorophenol	ND	330	µg/kg
1,2,4-Trichlorobenzene	ND	330	µg/kg
Naphthalene	ND	330	µg/kg
4-Chloroaniline	ND	330	µg/kg
Hexachlorobutadiene	ND	330	µg/kg
4-Chloro-3-methylphenol	ND	330	µg/kg
2-Methylnaphthalene	ND	330	µg/kg
Hexachlorocyclopentadiene	ND	330	µg/kg
2,4,6-Trichlorophenol	ND	330	µg/kg
2,4,5-Trichlorophenol	ND	1,700	µg/kg
2-Chloronaphthalene	ND	330	µg/kg
2-Nitroaniline	ND	1,700	µg/kg
Dimethyl Phthalate	ND	330	µg/kg
Acenaphthylene	ND	330	µg/kg
3-Nitroaniline	ND	1,700	µg/kg
Acenaphthene	ND	330	µg/kg
2,4-Dinitrophenol	ND	1,700	µg/kg
4-Nitrophenol	ND	1,700	µg/kg
Dibenzofuran	ND	330	µg/kg

ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270
(continued)

SPECTRALYTIX Sample ID: MET92-002-92050745

Analyte	Result	Detection Limit	Units
2,4-Dinitrotoluene	ND	330	µg/kg
2,6-Dinitrotoluene	ND	330	µg/kg
Diethyl Phthalate	ND	330	µg/kg
4-Chlorophenyl Phenyl Ether	ND	330	µg/kg
Fluorene	ND	330	µg/kg
4-Nitroaniline	ND	1,700	µg/kg
4,6-Dinitro-2-methylphenol	ND	1,700	µg/kg
N-Nitrosodiphenylamine	ND	330	µg/kg
4-Bromophenyl Phenyl Ether	ND	330	µg/kg
Hexachlorobenzene	ND	330	µg/kg
Pentachlorophenol	ND	1,700	µg/kg
Phenanthrene	ND	330	µg/kg
Anthracene	ND	330	µg/kg
Carbazole	ND	330	µg/kg
Di-n-butyl Phthalate	ND	330	µg/kg
Fluoranthene	ND	330	µg/kg
Pyrene	ND	330	µg/kg
Butylbenzyl Phthalate	ND	330	µg/kg
3,3'-Dichlorobenzidine	ND	330	µg/kg
Benzo(a)anthracene	ND	330	µg/kg
Bis(2-Ethylhexyl) Phthalate	ND	330	µg/kg
Chrysene	ND	330	µg/kg
Di-n-octyl Phthalate	ND	330	µg/kg
Benzo(b)fluoranthene	ND	330	µg/kg
Benzo(k)fluoranthene	ND	330	µg/kg
Benzo(a)pyrene	ND	330	µg/kg
Indeno(1,2,3-cd)pyrene	ND	330	µg/kg
Dibenz(a,h)anthracene	ND	330	µg/kg
Benzo(g,h,i)perylene	ND	330	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9208043-01A
Client ID: WFF7AF-SD10
Collected: 08/07/92
Dilution: 1

Matrix: SOIL
Method: SW846 8080
Units: ug/Kg

Analyst: PH
Analyzed: 08/13/92
Prepared: 08/11/92

GC TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
4,4'-DDD	23400.0	3.84	$
4,4'-DDE	BQL	1.39	
4,4'-DDT	362000.0	4.18	&
Aldrin	5.60	1.39	
alpha-BHC	1.74	1.05	
Aroclor 1016	BQL	17.4	
Aroclor 1221	BQL	17.4	
Aroclor 1232	BQL	17.4	
Aroclor 1242	BQL	22.6	
Aroclor 1248	BQL	34.8	
Aroclor 1254	BQL	34.8	
Aroclor 1260	BQL	34.8	
beta-BHC	BQL	2.09	
Chlordane	BQL	4.88	
delta-BHC	BQL	3.14	
Dieldrin	BQL	0.70	
Endosulfan I	BQL	4.88	
Endosulfan II	BQL	1.39	
Endosulfan sulfate	BQL	23.0	
Endrin	BQL	2.09	
Endrin aldehyde	BQL	8.02	
gamma-BHC (Lindane)	8.99	1.39	
Heptachlor	BQL	1.05	
Heptachlor epoxide	BQL	28.9	
Methoxychlor	BQL	61.3	
Toxaphene	BQL	83.6	

Total Metals

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SD10
SPECTRALYTIX Sample ID: MET92-002-92050745 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Aluminum	1,400	10	mg/kg
Antimony	ND	0.50	mg/kg
Arsenic	0.37	0.20	mg/kg
Barium	13	5.0	mg/kg
Berylium	ND	0.50	mg/kg
Cadmium	ND	1.0	mg/kg
Calcium	390	5.0	mg/kg
Chromium	ND	2.0	mg/kg
Cobalt	ND	2.5	mg/kg
Copper	3.0	2.0	mg/kg
Iron	1,100	5.0	mg/kg
Lead	8.9	5.0	mg/kg
Magnesium	47	5.0	mg/kg
Manganese	52	1.0	mg/kg
Mercury	ND	0.050	mg/kg
Nickel	ND	2.5	mg/kg
Potassium	150	5.0	mg/kg
Selenium	ND	0.20	mg/kg
Silver	ND	2.0	mg/kg
Sodium	22	0.50	mg/kg
Thallium	ND	0.50	mg/kg
Vanadium	3.5	2.5	mg/kg
Zinc	6.9	2.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Analyte not detected at or above the listed reporting limit.

Cyanides
Via EPA Method 335.3

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SD10
SPECTRALYTIX Sample ID: MET92-002-92050745 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/23/92
Date Analyzed : 06/03/92

Analyte	Result	Detection Limit	Units
Cyanide (CN)	ND	1	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Volatile Organic Compounds - EPA Method 8240/624

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SD2
SPECTRALYTIX Sample ID: MET92-002-92050750 Sample Type: Soil
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Analyzed: 05/29/92

Analyte	Result	Detection Limit	Units
Chloromethane	ND	10	µg/kg
Bromomethane	ND	10	µg/kg
Vinyl Chloride	ND	10	µg/kg
Chloroethane	ND	10	µg/kg
Methylene Chloride	ND	10	µg/kg
Acetone	ND	10	µg/kg
Carbon Disulfide	ND	10	µg/kg
1,1-Dichloroethene	ND	10	µg/kg
1,1-Dichloroethane	ND	10	µg/kg
1,2-Dichloroethenes, total	ND	10	µg/kg
Chloroform	ND	10	µg/kg
1,2-Dichloroethane	ND	10	µg/kg
2-Butanone	ND	10	µg/kg
1,1,1-Trichloroethane	ND	10	µg/kg
Carbon Tetrachloride	ND	10	µg/kg
Bromodichloromethane	ND	10	µg/kg
1,2-Dichloropropane	ND	10	µg/kg
Cis-1,3-Dichloropropene	ND	10	µg/kg
Trichloroethene	ND	10	µg/kg
Dibromochloromethane	ND	10	µg/kg
1,1,2-Trichloroethane	ND	10	µg/kg
Benzene	ND	10	µg/kg
Trans-1,3-Dichloropropene	ND	10	µg/kg
Bromoform	ND	10	µg/kg
4-Methyl-2-Pentanone	ND	10	µg/kg
2-Hexanone	ND	10	µg/kg
Tetrachloroethene	ND	10	µg/kg
1,1,2,2-Tetrachloroethane	ND	10	µg/kg
Toluene	ND	10	µg/kg
Chlorobenzene	ND	10	µg/kg
Ethylbenzene	ND	10	µg/kg
Styrene	ND	10	µg/kg
Xylenes, total	ND	10	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SD2
SPECTRALYTIX Sample ID: MET92-002-92050750 Sample Type: Soil
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Analyzed : 05/30/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SD2
SPECTRALYTIX Sample ID: MET92-002-92050750 Sample Type: Soil
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Extracted: 05/29/92 Date Analyzed: 06/05/92

Analyte	Result	Detection Limit	Units
Phenol	ND	330	µg/kg
Bis(2-Chloroethyl) Ether	ND	330	µg/kg
2-Chlorophenol	ND	330	µg/kg
1,3-Dichlorobenzene	ND	330	µg/kg
1,4-Dichlorobenzene	ND	330	µg/kg
1,2-Dichlorobenzene	ND	330	µg/kg
2-Methylphenol	ND	330	µg/kg
2,2'-Oxybis-(1-chloropropane)	ND	330	µg/kg
4-Methylphenol	ND	330	µg/kg
N-Nitroso-di-n-propylamine	ND	330	µg/kg
Hexachloroethane	ND	330	µg/kg
Nitrobenzene	ND	330	µg/kg
Isophorone	ND	330	µg/kg
2-Nitrophenol	ND	330	µg/kg
2,4-Dimethylphenol	ND	330	µg/kg
Bis(2-Chloroethoxy)methane	ND	330	µg/kg
2,4-Dichlorophenol	ND	330	µg/kg
1,2,4-Trichlorobenzene	ND	330	µg/kg
Naphthalene	ND	330	µg/kg
4-Chloroaniline	ND	330	µg/kg
Hexachlorobutadiene	ND	330	µg/kg
4-Chloro-3-methylphenol	ND	330	µg/kg
2-Methylnaphthalene	ND	330	µg/kg
Hexachlorocyclopentadiene	ND	330	µg/kg
2,4,6-Trichlorophenol	ND	330	µg/kg
2,4,5-Trichlorophenol	ND	1,700	µg/kg
2-Chloronaphthalene	ND	330	µg/kg
2-Nitroaniline	ND	1,700	µg/kg
Dimethyl Phthalate	ND	330	µg/kg
Acenaphthylene	ND	330	µg/kg
3-Nitroaniline	ND	1,700	µg/kg
Acenaphthene	ND	330	µg/kg
2,4-Dinitrophenol	ND	1,700	µg/kg
4-Nitrophenol	ND	1,700	µg/kg
Dibenzofuran	ND	330	µg/kg

ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270
(continued)

SPECTRALYTIX Sample ID: MET92-002-92050750

Analyte	Result	Detection Limit	Units
2,4-Dinitrotoluene	ND	330	µg/kg
2,6-Dinitrotoluene	ND	330	µg/kg
Diethyl Phthalate	ND	330	µg/kg
4-Chlorophenyl Phenyl Ether	ND	330	µg/kg
Fluorene	ND	330	µg/kg
4-Nitroaniline	ND	1,700	µg/kg
4,6-Dinitro-2-methylphenol	ND	1,700	µg/kg
N-Nitrosodiphenylamine	ND	330	µg/kg
4-Bromophenyl Phenyl Ether	ND	330	µg/kg
Hexachlorobenzene	ND	330	µg/kg
Pentachlorophenol	ND	1,700	µg/kg
Phenanthrene	ND	330	µg/kg
Anthracene	ND	330	µg/kg
Carbazole	ND	330	µg/kg
Di-n-butyl Phthalate	ND	330	µg/kg
Fluoranthene	ND	330	µg/kg
Pyrene	ND	330	µg/kg
Butylbenzyl Phthalate	ND	330	µg/kg
3,3'-Dichlorobenzidine	ND	330	µg/kg
Benzo(a)anthracene	ND	330	µg/kg
Bis(2-Ethylhexyl) Phthalate	ND	330	µg/kg
Chrysene	ND	330	µg/kg
Di-n-octyl Phthalate	ND	330	µg/kg
Benzo(b)fluoranthene	ND	330	µg/kg
Benzo(k)fluoranthene	ND	330	µg/kg
Benzo(a)pyrene	ND	330	µg/kg
Indeno(1,2,3-cd)pyrene	ND	330	µg/kg
Dibenz(a,h)anthracene	ND	330	µg/kg
Benzo(g,h,i)perylene	ND	330	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9208043-05A
Client ID: WFF7AF-SD2
Collected: 08/07/92
Dilution: 1

Matrix: SOIL
Method: SW846 8080
Units: ug/Kg

Analyst: AD
Analyzed: 08/12/92
Prepared: 08/11/92

GC TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
4,4'-DDD	799.0	4.91	
4,4'-DDE	51.9	1.78	
4,4'-DDT	30.5	5.35	
Aldrin	BQL	1.78	
alpha-BHC	BQL	1.34	
Aroclor 1016	BQL	22.3	
Aroclor 1221	BQL	22.3	
Aroclor 1232	BQL	22.3	
Aroclor 1242	BQL	29.0	
Aroclor 1248	BQL	44.6	
Aroclor 1254	BQL	44.6	
Aroclor 1260	BQL	44.6	
beta-BHC	BQL	2.67	
Chlordane	6.92	6.24	
delta-BHC	BQL	4.02	
Dieldrin	BQL	0.89	
Endosulfan I	3.83	6.24	J
Endosulfan II	BQL	1.78	
Endosulfan sulfate	BQL	29.4	
Endrin	BQL	2.67	
Endrin aldehyde	BQL	10.2	
gamma-BHC (Lindane)	BQL	1.78	
Heptachlor	BQL	1.34	
Heptachlor epoxide	BQL	37.0	
Methoxychlor	BQL	78.4	
Toxaphene	BQL	107.0	

Total Metals

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SD2
SPECTRALYTIX Sample ID: MET92-002-92050750 Sample Type: Soil
Date Sampled : 05/21/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Aluminum	370	10	mg/kg
Antimony	ND	0.50	mg/kg
Arsenic	0.43	0.20	mg/kg
Barium	ND	5.0	mg/kg
Berylium	ND	0.50	mg/kg
Cadmium	ND	1.0	mg/kg
Calcium	120	5.0	mg/kg
Chromium	ND	2.0	mg/kg
Cobalt	ND	2.5	mg/kg
Copper	ND	2.0	mg/kg
Iron	620	5.0	mg/kg
Lead	ND	5.0	mg/kg
Magnesium	20	5.0	mg/kg
Manganese	6.8	1.0	mg/kg
Mercury	ND	0.050	mg/kg
Nickel	ND	2.5	mg/kg
Potassium	16	5.0	mg/kg
Selenium	ND	0.20	mg/kg
Silver	ND	2.0	mg/kg
Sodium	7.3	0.50	mg/kg
Thallium	ND	0.50	mg/kg
Vanadium	2.9	2.5	mg/kg
Zinc	4.4	2.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Analyte not detected at or above the listed reporting limit.

EPA-CLP Target Compound List
Volatile Organic Compounds - EPA Method 8240/624

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WSS7AF-SD3
SPECTRALYTIX Sample ID: MET92-002-92050746 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/23/92
Date Analyzed: 05/28/92

Analyte	Result	Detection Limit	Units
Chloromethane	ND	10	µg/kg
Bromomethane	ND	10	µg/kg
Vinyl Chloride	ND	10	µg/kg
Chloroethane	ND	10	µg/kg
Methylene Chloride	ND	10	µg/kg
Acetone	ND	10	µg/kg
Carbon Disulfide	ND	10	µg/kg
1,1-Dichloroethene	ND	10	µg/kg
1,1-Dichloroethane	ND	10	µg/kg
1,2-Dichloroethenes, total	ND	10	µg/kg
Chloroform	ND	10	µg/kg
1,2-Dichloroethane	ND	10	µg/kg
2-Butanone	ND	10	µg/kg
1,1,1-Trichloroethane	ND	10	µg/kg
Carbon Tetrachloride	ND	10	µg/kg
Bromodichloromethane	ND	10	µg/kg
1,2-Dichloropropane	ND	10	µg/kg
Cis-1,3-Dichloropropene	ND	10	µg/kg
Trichloroethene	ND	10	µg/kg
Dibromochloromethane	ND	10	µg/kg
1,1,2-Trichloroethane	ND	10	µg/kg
Benzene	ND	10	µg/kg
Trans-1,3-Dichloropropene	ND	10	µg/kg
Bromoform	ND	10	µg/kg
4-Methyl-2-Pentanone	ND	10	µg/kg
2-Hexanone	ND	10	µg/kg
Tetrachloroethene	ND	10	µg/kg
1,1,2,2-Tetrachloroethane	ND	10	µg/kg
Toluene	ND	10	µg/kg
Chlorobenzene	ND	10	µg/kg
Ethylbenzene	ND	10	µg/kg
Styrene	ND	10	µg/kg
Xylenes, total	ND	10	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WSS7AF-SD3
SPECTRALYTIX Sample ID: MET92-002-92050746 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/23/92
Date Analyzed : 05/29/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WSS7AF-SD3
SPECTRALYTIX Sample ID: MET92-002-92050746 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/23/92
Date Extracted: 05/29/92 Date Analyzed: 06/05/92

Analyte	Result	Detection Limit	Units
Phenol	ND	330	µg/kg
Bis(2-Chloroethyl) Ether	ND	330	µg/kg
2-Chlorophenol	ND	330	µg/kg
1,3-Dichlorobenzene	ND	330	µg/kg
1,4-Dichlorobenzene	ND	330	µg/kg
1,2-Dichlorobenzene	ND	330	µg/kg
2-Methylphenol	ND	330	µg/kg
2,2'-Oxybis-(1-chloropropane)	ND	330	µg/kg
4-Methylphenol	ND	330	µg/kg
N-Nitroso-di-n-propylamine	ND	330	µg/kg
Hexachloroethane	ND	330	µg/kg
Nitrobenzene	ND	330	µg/kg
Isophorone	ND	330	µg/kg
2-Nitrophenol	ND	330	µg/kg
2,4-Dimethylphenol	ND	330	µg/kg
Bis(2-Chloroethoxy)methane	ND	330	µg/kg
2,4-Dichlorophenol	ND	330	µg/kg
1,2,4-Trichlorobenzene	ND	330	µg/kg
Naphthalene	ND	330	µg/kg
4-Chloroaniline	ND	330	µg/kg
Hexachlorobutadiene	ND	330	µg/kg
4-Chloro-3-methylphenol	ND	330	µg/kg
2-Methylnaphthalene	ND	330	µg/kg
Hexachlorocyclopentadiene	ND	330	µg/kg
2,4,6-Trichlorophenol	ND	330	µg/kg
2,4,5-Trichlorophenol	ND	1,700	µg/kg
2-Chloronaphthalene	ND	330	µg/kg
2-Nitroaniline	ND	1,700	µg/kg
Dimethyl Phthalate	ND	330	µg/kg
Acenaphthylene	ND	330	µg/kg
3-Nitroaniline	ND	1,700	µg/kg
Acenaphthene	ND	330	µg/kg
2,4-Dinitrophenol	ND	1,700	µg/kg
4-Nitrophenol	ND	1,700	µg/kg
Dibenzofuran	ND	330	µg/kg

ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270
(continued)

SPECTRALYTIX Sample ID: MET92-002-92050746

Analyte	Result	Detection Limit	Units
2,4-Dinitrotoluene	ND	330	µg/kg
2,6-Dinitrotoluene	ND	330	µg/kg
Diethyl Phthalate	ND	330	µg/kg
4-Chlorophenyl Phenyl Ether	ND	330	µg/kg
Fluorene	ND	330	µg/kg
4-Nitroaniline	ND	1,700	µg/kg
4,6-Dinitro-2-methylphenol	ND	1,700	µg/kg
N-Nitrosodiphenylamine	ND	330	µg/kg
4-Bromophenyl Phenyl Ether	ND	330	µg/kg
Hexachlorobenzene	ND	330	µg/kg
Pentachlorophenol	ND	1,700	µg/kg
Phenanthrene	ND	330	µg/kg
Anthracene	ND	330	µg/kg
Carbazole	ND	330	µg/kg
Di-n-butyl Phthalate	ND	330	µg/kg
Fluoranthene	ND	330	µg/kg
Pyrene	ND	330	µg/kg
Butylbenzyl Phthalate	ND	330	µg/kg
3,3'-Dichlorobenzidine	ND	330	µg/kg
Benzo(a)anthracene	ND	330	µg/kg
Bis(2-Ethylhexyl) Phthalate	ND	330	µg/kg
Chrysene	ND	330	µg/kg
Di-n-octyl Phthalate	ND	330	µg/kg
Benzo(b)fluoranthene	ND	330	µg/kg
Benzo(k)fluoranthene	ND	330	µg/kg
Benzo(a)pyrene	ND	330	µg/kg
Indeno(1,2,3-cd)pyrene	ND	330	µg/kg
Dibenz(a,h)anthracene	ND	330	µg/kg
Benzo(g,h,i)perylene	ND	330	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9208043-02A
Client ID: WFF7AF-SD3
Collected: 08/07/92
Dilution: 1

Matrix: SOIL
Method: SW846 8080
Units: ug/Kg

Analyst: AD
Analyzed: 08/12/92
Prepared: 08/11/92

GC TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
4,4'-DDD	BQL	4.39	
4,4'-DDE	7.47	1.59	
4,4'-DDT	31.1	4.78	
Aldrin	BQL	1.59	
alpha-BHC	BQL	1.20	
Aroclor 1016	BQL	19.9	
Aroclor 1221	BQL	19.9	
Aroclor 1232	BQL	19.9	
Aroclor 1242	BQL	25.9	
Aroclor 1248	BQL	39.9	
Aroclor 1254	BQL	39.9	
Aroclor 1260	BQL	39.9	
beta-BHC	BQL	2.39	
Chlordane	BQL	5.58	
delta-BHC	BQL	3.59	
Dieldrin	BQL	0.79	
Endosulfan I	BQL	5.58	
Endosulfan II	BQL	1.59	
Endosulfan sulfate	BQL	26.3	
Endrin	BQL	2.39	
Endrin aldehyde	BQL	9.17	
gamma-BHC (Lindane)	BQL	1.59	
Heptachlor	BQL	1.20	
Heptachlor epoxide	BQL	33.1	
Methoxychlor	BQL	70.2	
Toxaphene	BQL	95.7	

Total Metals

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WSS7AF-SD3
SPECTRALYTIX Sample ID: MET92-002-92050746 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Aluminum	3,600	10	mg/kg
Antimony	ND	0.50	mg/kg
Arsenic	0.70	0.20	mg/kg
Barium	25	5.0	mg/kg
Berylium	ND	0.50	mg/kg
Cadmium	ND	1.0	mg/kg
Calcium	330	5.0	mg/kg
Chromium	2.8	2.0	mg/kg
Cobalt	ND	2.5	mg/kg
Copper	3.7	2.0	mg/kg
Iron	2,900	5.0	mg/kg
Lead	ND	5.0	mg/kg
Magnesium	28	5.0	mg/kg
Manganese	110	1.0	mg/kg
Mercury	ND	0.050	mg/kg
Nickel	ND	2.5	mg/kg
Potassium	180	5.0	mg/kg
Selenium	ND	0.20	mg/kg
Silver	ND	2.0	mg/kg
Sodium	23	0.50	mg/kg
Thallium	ND	0.50	mg/kg
Vanadium	7.9	2.5	mg/kg
Zinc	7.9	2.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Analyte not detected at or above the listed reporting limit.

Cyanides
Via EPA Method 335.3

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WSS7AF-SD3
SPECTRALYTIX Sample ID: MET92-002-92050746 Sample Type: Soil
Date Sampled : 05/20/92 Date Received: 05/23/92
Date Analyzed : 06/03/92

Analyte	Result	Detection Limit	Units
Cyanide (CN)	ND	1	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SW1
SPECTRALYTIX Sample ID: MET92-002-92050753 Sample Type: Water
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Analyzed : 05/30/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/L

Units of mg/L are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 625

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SW1
SPECTRALYTIX Sample ID: MET92-002-92050753 Sample Type: Water
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Extracted: 05/27/92 Date Analyzed: 06/08/92

Analyte	Result	Detection Limit	Units
Phenol	ND	10	µg/L
Bis(2-Chloroethyl) Ether	ND	10	µg/L
2-Chlorophenol	ND	10	µg/L
1,3-Dichlorobenzene	ND	10	µg/L
1,4-Dichlorobenzene	ND	10	µg/L
1,2-Dichlorobenzene	ND	10	µg/L
2-Methylphenol	ND	10	µg/L
2,2'-Oxybis-(1-chloropropane)	ND	10	µg/L
4-Methylphenol	ND	10	µg/L
N-Nitroso-di-n-propylamine	ND	10	µg/L
Hexachloroethane	ND	10	µg/L
Nitrobenzene	ND	10	µg/L
Isophorone	ND	10	µg/L
2-Nitrophenol	ND	10	µg/L
2,4-Dimethylphenol	ND	10	µg/L
Bis(2-Chloroethoxy)methane	ND	10	µg/L
2,4-Dichlorophenol	ND	10	µg/L
1,2,4-Trichlorobenzene	ND	10	µg/L
Naphthalene	ND	10	µg/L
4-Chloroaniline	ND	10	µg/L
Hexachlorobutadiene	ND	10	µg/L
4-Chloro-3-methylphenol	ND	10	µg/L
2-Methylnaphthalene	ND	10	µg/L
Hexachlorocyclopentadiene	ND	10	µg/L
2,4,6-Trichlorophenol	ND	10	µg/L
2,4,5-Trichlorophenol	ND	50	µg/L
2-Chloronaphthalene	ND	10	µg/L
2-Nitroaniline	ND	50	µg/L
Dimethyl Phthalate	ND	10	µg/L
Acenaphthylene	ND	10	µg/L
3-Nitroaniline	ND	50	µg/L
Acenaphthene	ND	10	µg/L
2,4-Dinitrophenol	ND	50	µg/L
4-Nitrophenol	ND	50	µg/L
Dibenzofuran	ND	10	µg/L

ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 625
(continued)

SPECTRALYTIX Sample ID: MET92-002-92050753

Analyte	Result	Detection Limit	Units
2,4-Dinitrotoluene	ND	10	µg/L
2,6-Dinitrotoluene	ND	10	µg/L
Diethyl Phthalate	ND	10	µg/L
4-Chlorophenyl Phenyl Ether	ND	10	µg/L
Fluorene	ND	10	µg/L
4-Nitroaniline	ND	50	µg/L
4,6-Dinitro-2-methylphenol	ND	50	µg/L
N-Nitrosodiphenylamine	ND	10	µg/L
4-Bromophenyl Phenyl Ether	ND	10	µg/L
Hexachlorobenzene	ND	10	µg/L
Pentachlorophenol	ND	50	µg/L
Phenanthrene	ND	10	µg/L
Anthracene	ND	10	µg/L
Carbazole	ND	10	µg/L
Di-n-butyl Phthalate	ND	10	µg/L
Fluoranthene	ND	10	µg/L
Pyrene	ND	10	µg/L
Butylbenzyl Phthalate	ND	10	µg/L
3,3'-Dichlorobenzidine	ND	10	µg/L
Benzo(a)anthracene	ND	10	µg/L
Bis(2-Ethylhexyl) Phthalate	ND	10	µg/L
Chrysene	ND	10	µg/L
Di-n-octyl Phthalate	ND	10	µg/L
Benzo(b)fluoranthene	ND	10	µg/L
Benzo(k)fluoranthene	ND	10	µg/L
Benzo(a)pyrene	ND	10	µg/L
Indeno(1,2,3-cd)pyrene	ND	10	µg/L
Dibenz(a,h)anthracene	ND	10	µg/L
Benzo(g,h,i)perylene	ND	10	µg/L

Units of µg/L are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Organochlorine Pesticides/PCB's
EPA Method 8080

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SW1
SPECTRALYTIX Sample ID: MET92-002-92050753 Sample Type: Water
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Extracted: 05/28/92 Date Analyzed: 06/02/92

Analyte	Result	Detection Limit	Units
alpha-BHC	ND	0.05	µg/L
beta-BHC	ND	0.05	µg/L
delta-BHC	ND	0.05	µg/L
gamma-BHC (Lindane)	ND	0.05	µg/L
Heptachlor	ND	0.05	µg/L
Aldrin	ND	0.05	µg/L
Heptachlor epoxide	ND	0.05	µg/L
gamma-Chlordane	ND	0.05	µg/L
Endosulfan I	ND	0.05	µg/L
alpha-Chlordane	ND	0.05	µg/L
Dieldrin	ND	0.1	µg/L
4,4'-DDE	ND	0.1	µg/L
Endrin	ND	0.1	µg/L
Endosulfan II	ND	0.1	µg/L
4,4'-DDD	ND	0.1	µg/L
Endosulfin sulfate	ND	0.1	µg/L
4,4'-DDT	ND	0.1	µg/L
Endrin ketone	ND	0.1	µg/L
Endrin aldehyde	ND	0.1	µg/L
Methoxychlor	ND	0.5	µg/L
Toxaphene	ND	5.0	µg/L
PCB-1016	ND	1.0	µg/L
PCB-1221	ND	1.0	µg/L
PCB-1232	ND	1.0	µg/L
PCB-1242	ND	1.0	µg/L
PCB-1248	ND	1.0	µg/L
PCB-1254	ND	1.0	µg/L
PCB-1260	ND	1.0	µg/L

Units of µg/L are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Metals

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SW1
SPECTRALYTIX Sample ID: MET92-002-92050753 Sample Type: Water
Date Sampled : 05/21/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Aluminum	ND	0.10	mg/L
Antimony	ND	0.0050	mg/L
Arsenic	ND	0.0020	mg/L
Barium	ND	0.050	mg/L
Berylium	ND	0.005	mg/L
Cadmium	ND	0.010	mg/L
Calcium	8.6	0.050	mg/L
Chromium	ND	0.020	mg/L
Cobalt	ND	0.025	mg/L
Copper	0.083	0.020	mg/L
Iron	0.21	0.050	mg/L
Lead	ND	0.050	mg/L
Magnesium	3.0	0.050	mg/L
Manganese	0.084	0.010	mg/L
Mercury	ND	0.00050	mg/L
Nickel	ND	0.025	mg/L
Potassium	2.6	0.050	mg/L
Selenium	ND	0.0020	mg/L
Silver	ND	0.020	mg/L
Sodium	5.4	0.050	mg/L
Thallium	ND	0.0050	mg/L
Vanadium	ND	0.025	mg/L
Zinc	ND	0.020	mg/L

Units of mg/L are equivalent to ppm.
ND = Analyte not detected at or above the listed reporting limit.

EPA-CLP Target Compound List
Volatile Organic Compounds - EPA Method 8240/624

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SW2
SPECTRALYTIX Sample ID: MET92-002-92050749 Sample Type: Water
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Analyzed: 05/29/92

Analyte	Result	Detection Limit	Units
Chloromethane	ND	10	µg/L
Bromomethane	ND	10	µg/L
Vinyl Chloride	ND	10	µg/L
Chloroethane	ND	10	µg/L
Methylene Chloride	ND	10	µg/L
Acetone	ND	10	µg/L
Carbon Disulfide	ND	10	µg/L
1,1-Dichloroethene	ND	10	µg/L
1,1-Dichloroethane	ND	10	µg/L
1,2-Dichloroethenes, total	ND	10	µg/L
Chloroform	ND	10	µg/L
1,2-Dichloroethane	ND	10	µg/L
2-Butanone	ND	10	µg/L
1,1,1-Trichloroethane	ND	10	µg/L
Carbon Tetrachloride	ND	10	µg/L
Bromodichloromethane	ND	10	µg/L
1,2-Dichloropropane	ND	10	µg/L
Cis-1,3-Dichloropropene	ND	10	µg/L
Trichloroethene	ND	10	µg/L
Dibromochloromethane	ND	10	µg/L
1,1,2-Trichloroethane	ND	10	µg/L
Benzene	ND	10	µg/L
Trans-1,3-Dichloropropene	ND	10	µg/L
Bromoform	ND	10	µg/L
4-Methyl-2-Pentanone	ND	10	µg/L
2-Hexanone	ND	10	µg/L
Tetrachloroethene	ND	10	µg/L
1,1,2,2-Tetrachloroethane	ND	10	µg/L
Toluene	ND	10	µg/L
Chlorobenzene	ND	10	µg/L
Ethylbenzene	ND	10	µg/L
Styrene	ND	10	µg/L
Xylenes, total	ND	10	µg/L

Units of µg/L are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SW2
SPECTRALYTIX Sample ID: MET92-002-92050749 Sample Type: Water
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Analyzed : 05/30/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/L

Units of mg/L are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SW2
SPECTRALYTIX Sample ID: MET92-002-92050749 Sample Type: Water
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Extracted: 05/27/92 Date Analyzed: 06/08/92

Analyte	Result	Detection Limit	Units
Phenol	ND	10	µg/L
Bis(2-Chloroethyl) Ether	ND	10	µg/L
2-Chlorophenol	ND	10	µg/L
1,3-Dichlorobenzene	ND	10	µg/L
1,4-Dichlorobenzene	ND	10	µg/L
1,2-Dichlorobenzene	ND	10	µg/L
2-Methylphenol	ND	10	µg/L
2,2'-Oxybis-(1-chloropropane)	ND	10	µg/L
4-Methylphenol	ND	10	µg/L
N-Nitroso-di-n-propylamine	ND	10	µg/L
Hexachloroethane	ND	10	µg/L
Nitrobenzene	ND	10	µg/L
Isophorone	ND	10	µg/L
2-Nitrophenol	ND	10	µg/L
2,4-Dimethylphenol	ND	10	µg/L
Bis(2-Chloroethoxy)methane	ND	10	µg/L
2,4-Dichlorophenol	ND	10	µg/L
1,2,4-Trichlorobenzene	ND	10	µg/L
Naphthalene	ND	10	µg/L
4-Chloroaniline	ND	10	µg/L
Hexachlorobutadiene	ND	10	µg/L
4-Chloro-3-methylphenol	ND	10	µg/L
2-Methylnaphthalene	ND	10	µg/L
Hexachlorocyclopentadiene	ND	10	µg/L
2,4,6-Trichlorophenol	ND	10	µg/L
2,4,5-Trichlorophenol	ND	50	µg/L
2-Chloronaphthalene	ND	10	µg/L
2-Nitroaniline	ND	50	µg/L
Dimethyl Phthalate	ND	10	µg/L
Acenaphthylene	ND	10	µg/L
3-Nitroaniline	ND	50	µg/L
Acenaphthene	ND	10	µg/L
2,4-Dinitrophenol	ND	50	µg/L
4-Nitrophenol	ND	50	µg/L
Dibenzofuran	ND	10	µg/L

ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 8270
(continued)

SPECTRALYTIX Sample ID: MET92-002-92050749

Analyte	Result	Detection Limit	Units
2,4-Dinitrotoluene	ND	10	µg/L
2,6-Dinitrotoluene	ND	10	µg/L
Diethyl Phthalate	ND	10	µg/L
4-Chlorophenyl Phenyl Ether	ND	10	µg/L
Fluorene	ND	10	µg/L
4-Nitroaniline	ND	50	µg/L
4,6-Dinitro-2-methylphenol	ND	50	µg/L
N-Nitrosodiphenylamine	ND	10	µg/L
4-Bromophenyl Phenyl Ether	ND	10	µg/L
Hexachlorobenzene	ND	10	µg/L
Pentachlorophenol	ND	50	µg/L
Phenanthrene	ND	10	µg/L
Anthracene	ND	10	µg/L
Carbazole	ND	10	µg/L
Di-n-butyl Phthalate	ND	10	µg/L
Fluoranthene	ND	10	µg/L
Pyrene	ND	10	µg/L
Butylbenzyl Phthalate	ND	10	µg/L
3,3'-Dichlorobenzidine	ND	10	µg/L
Benzo(a)anthracene	ND	10	µg/L
Bis(2-Ethylhexyl) Phthalate	ND	10	µg/L
Chrysene	ND	10	µg/L
Di-n-octyl Phthalate	ND	10	µg/L
Benzo(b)fluoranthene	ND	10	µg/L
Benzo(k)fluoranthene	ND	10	µg/L
Benzo(a)pyrene	ND	10	µg/L
Indeno(1,2,3-cd)pyrene	ND	10	µg/L
Dibenz(a,h)anthracene	ND	10	µg/L
Benzo(g,h,i)perylene	ND	10	µg/L

Units of µg/L are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Organochlorine Pesticides/PCB's
EPA Method 8080

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SW2
SPECTRALYTIX Sample ID: MET92-002-92050749 Sample Type: Water
Date Sampled : 05/21/92 Date Received: 05/23/92
Date Extracted: 05/28/92 Date Analyzed: 06/02/92

Analyte	Result	Detection Limit	Units
alpha-BHC	ND	0.05	µg/L
beta-BHC	ND	0.05	µg/L
delta-BHC	ND	0.05	µg/L
gamma-BHC (Lindane)	ND	0.05	µg/L
Heptachlor	ND	0.05	µg/L
Aldrin	ND	0.05	µg/L
Heptachlor epoxide	ND	0.05	µg/L
gamma-Chlordane	ND	0.05	µg/L
Endosulfan I	ND	0.05	µg/L
alpha-Chlordane	ND	0.05	µg/L
Dieldrin	ND	0.1	µg/L
4,4'-DDE	ND	0.1	µg/L
Endrin	ND	0.1	µg/L
Endosulfan II	ND	0.1	µg/L
4,4'-DDD	ND	0.1	µg/L
Endosulfin sulfate	ND	0.1	µg/L
4,4'-DDT	ND	0.1	µg/L
Endrin ketone	ND	0.1	µg/L
Endrin aldehyde	ND	0.1	µg/L
Methoxychlor	ND	0.5	µg/L
Toxaphene	ND	5.0	µg/L
PCB-1016	ND	1.0	µg/L
PCB-1221	ND	1.0	µg/L
PCB-1232	ND	1.0	µg/L
PCB-1242	ND	1.0	µg/L
PCB-1248	ND	1.0	µg/L
PCB-1254	ND	1.0	µg/L
PCB-1260	ND	1.0	µg/L

Units of µg/L are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Metals

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SW2
SPECTRALYTIX Sample ID: MET92-002-92050749 Sample Type: Water
Date Sampled : 05/21/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Aluminum	ND	0.10	mg/L
Antimony	ND	0.0050	mg/L
Arsenic	ND	0.0020	mg/L
Barium	ND	0.050	mg/L
Berylium	ND	0.005	mg/L
Cadmium	ND	0.010	mg/L
Calcium	9.2	0.050	mg/L
Chromium	ND	0.020	mg/L
Cobalt	ND	0.025	mg/L
Copper	0.042	0.020	mg/L
Iron	0.12	0.050	mg/L
Lead	ND	0.050	mg/L
Magnesium	4.3	0.050	mg/L
Manganese	0.044	0.010	mg/L
Mercury	ND	0.00050	mg/L
Nickel	ND	0.025	mg/L
Potassium	3.5	0.050	mg/L
Selenium	ND	0.0020	mg/L
Silver	ND	0.020	mg/L
Sodium	8.2	0.050	mg/L
Thallium	ND	0.0050	mg/L
Vanadium	ND	0.025	mg/L
Zinc	ND	0.020	mg/L

Units of mg/L are equivalent to ppm.
ND = Analyte not detected at or above the listed reporting limit.

BTEX
EPA Method 8020

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB1
SPECTRALYTIX Sample ID: MET92-002-92050757 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed: 05/29/92

Analyte	Result	Detection Limit	Units
Benzene	250	3	µg/kg
Toluene	560	3	µg/kg
Ethylbenzene	390	3	µg/kg
Total Xylenes	3,500	3	µg/kg

Confirmation was performed using an Rt-X1 column in a dissimilar GC system.

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Lead and Manganese

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB1
SPECTRALYTIX Sample ID: MET92-002-92050757 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Lead	ND	5.0	mg/kg
Manganese	100	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

BTEX
EPA Method 8020

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB2
SPECTRALYTIX Sample ID: MET92-002-92050756 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed: 05/29/92

Analyte	Result	Detection Limit	Units
Benzene	ND	3	µg/kg
Toluene	ND	3	µg/kg
Ethylbenzene	ND	3	µg/kg
Total Xylenes	ND	3	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Lead and Manganese

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB2
SPECTRALYTIX Sample ID: MET92-002-92050756 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Lead	ND	5.0	mg/kg
Manganese	76	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

BTEX
EPA Method 8020

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB3
SPECTRALYTIX Sample ID: MET92-002-92050763 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed: 05/29/92

Analyte	Result	Detection Limit	Units
Benzene	ND	3	µg/kg
Toluene	ND	3	µg/kg
Ethylbenzene	ND	3	µg/kg
Total Xylenes	ND	3	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Lead and Manganese

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB3
SPECTRALYTIX Sample ID: MET92-002-92050763 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Lead	ND	5.0	mg/kg
Manganese	42	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

BTEX
EPA Method 8020

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB4
SPECTRALYTIX Sample ID: MET92-002-92050762 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed: 05/29/92

Analyte	Result	Detection Limit	Units
Benzene	ND	3	µg/kg
Toluene	ND	3	µg/kg
Ethylbenzene	ND	3	µg/kg
Total Xylenes	ND	3	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Lead and Manganese

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB4
SPECTRALYTIX Sample ID: MET92-002-92050762 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Lead	ND	5.0	mg/kg
Manganese	32	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

BTEX
EPA Method 8020

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB5
SPECTRALYTIX Sample ID: MET92-002-92050761 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed: 05/29/92

Analyte	Result	Detection Limit	Units
Benzene	ND	3	µg/kg
Toluene	1,600	3	µg/kg
Ethylbenzene	ND	3	µg/kg
Total Xylenes	550	3	µg/kg

Confirmation was performed using an Rt-X1 column in a dissimilar GC system.

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Lead and Manganese

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB5
SPECTRALYTIX Sample ID: MET92-002-92050761 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Lead	8.4	5.0	mg/kg
Manganese	84	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

BTEX
EPA Method 8020

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB6
SPECTRALYTIX Sample ID: MET92-002-92050760 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed: 05/29/92

Analyte	Result	Detection Limit	Units
Benzene	ND	3	µg/kg
Toluene	6	3	µg/kg
Ethylbenzene	ND	3	µg/kg
Total Xylenes	180	3	µg/kg

Confirmation was performed using an Rt-X1 column in a dissimilar GC system.

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Lead and Manganese

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB6
SPECTRALYTIX Sample ID: MET92-002-92050760 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Lead	11	5.0	mg/kg
Manganese	43	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

BTEX
EPA Method 8020

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB7
SPECTRALYTIX Sample ID: MET92-002-92050759 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed: 05/29/92

Analyte	Result	Detection Limit	Units
Benzene	ND	3	µg/kg
Toluene	ND	3	µg/kg
Ethylbenzene	ND	3	µg/kg
Total Xylenes	ND	3	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Lead and Manganese

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB7
SPECTRALYTIX Sample ID: MET92-002-92050759 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Lead	ND	5.0	mg/kg
Manganese	29	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

BTEX
EPA Method 8020

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB8
SPECTRALYTIX Sample ID: MET92-002-92050764 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed: 05/29/92

Analyte	Result	Detection Limit	Units
Benzene	ND	3	µg/kg
Toluene	ND	3	µg/kg
Ethylbenzene	ND	3	µg/kg
Total Xylenes	ND	3	µg/kg

Units of µg/kg are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Lead and Manganese

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-SB8
SPECTRALYTIX Sample ID: MET92-002-92050764 Sample Type: Soil
Date Sampled : 05/22/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Lead	ND	5.0	mg/kg
Manganese	26	1.0	mg/kg

Units of mg/kg are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Volatile Organic Compounds - EPA Method 8240/624

Client: METCALF & EDDY, INC./NASA 007
Client Sample ID: WFF7-TB1
SPECTRALYTIX Sample ID: MET92-001-92050677 Sample Type: Water
Date Sampled : 05/20/92 Date Received: 05/21/92
Date Analyzed: 06/03/92

Analyte	Result	Detection Limit	Units
Chloromethane	ND	10	µg/L
Bromomethane	ND	10	µg/L
Vinyl Chloride	ND	10	µg/L
Chloroethane	ND	10	µg/L
Methylene Chloride	ND	10	µg/L
Acetone	ND	10	µg/L
Carbon Disulfide	ND	10	µg/L
1,1-Dichloroethene	ND	10	µg/L
1,1-Dichloroethane	ND	10	µg/L
1,2-Dichloroethenes, total	ND	10	µg/L
Chloroform	ND	10	µg/L
1,2-Dichloroethane	ND	10	µg/L
2-Butanone	ND	10	µg/L
1,1,1-Trichloroethane	ND	10	µg/L
Carbon Tetrachloride	ND	10	µg/L
Bromodichloromethane	ND	10	µg/L
1,2-Dichloropropane	ND	10	µg/L
Cis-1,3-Dichloropropene	ND	10	µg/L
Trichloroethene	ND	10	µg/L
Dibromochloromethane	ND	10	µg/L
1,1,2-Trichloroethane	ND	10	µg/L
Benzene	ND	10	µg/L
Trans-1,3-Dichloropropene	ND	10	µg/L
2-Chloroethyl Vinyl Ether	ND	10	µg/L
Bromoform	ND	10	µg/L
4-Methyl-2-Pentanone	ND	10	µg/L
2-Hexanone	ND	10	µg/L
Tetrachloroethene	ND	10	µg/L
1,1,2,2-Tetrachloroethane	ND	10	µg/L
Toluene	ND	10	µg/L
Chlorobenzene	ND	10	µg/L
Ethylbenzene	ND	10	µg/L
Styrene	ND	10	µg/L
Xylenes, total	ND	10	µg/L

Units of µg/L are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Volatile Organic Compounds - EPA Method 8240/624

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7AF-TB2
SPECTRALYTIX Sample ID: MET92-002-92050765 Sample Type: Water
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed: 06/09/92

Analyte	Result	Detection Limit	Units
Chloromethane	ND	10	µg/L
Bromomethane	ND	10	µg/L
Vinyl Chloride	ND	10	µg/L
Chloroethane	ND	10	µg/L
Methylene Chloride	ND	10	µg/L
Acetone	ND	10	µg/L
Carbon Disulfide	ND	10	µg/L
1,1-Dichloroethene	ND	10	µg/L
1,1-Dichloroethane	ND	10	µg/L
1,2-Dichloroethenes, total	ND	10	µg/L
Chloroform	ND	10	µg/L
1,2-Dichloroethane	ND	10	µg/L
2-Butanone	ND	10	µg/L
1,1,1-Trichloroethane	ND	10	µg/L
Carbon Tetrachloride	ND	10	µg/L
Bromodichloromethane	ND	10	µg/L
1,2-Dichloropropane	ND	10	µg/L
Cis-1,3-Dichloropropene	ND	10	µg/L
Trichloroethene	ND	10	µg/L
Dibromochloromethane	ND	10	µg/L
1,1,2-Trichloroethane	ND	10	µg/L
Benzene	ND	10	µg/L
Trans-1,3-Dichloropropene	ND	10	µg/L
2-Chloroethyl Vinyl Ether	ND	10	µg/L
Bromoform	ND	10	µg/L
4-Methyl-2-Pentanone	ND	10	µg/L
2-Hexanone	ND	10	µg/L
Tetrachloroethene	ND	10	µg/L
1,1,2,2-Tetrachloroethane	ND	10	µg/L
Toluene	ND	10	µg/L
Chlorobenzene	ND	10	µg/L
Ethylbenzene	ND	10	µg/L
Styrene	ND	10	µg/L
Xylenes, total	ND	10	µg/L

Units of µg/L are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Volatile Organic Compounds - EPA Method 8240/624

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7-EB-1
SPECTRALYTIX Sample ID: MET92-002-92050755 Sample Type: Water
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed: 06/09/92

Analyte	Result	Detection Limit	Units
Chloromethane	ND	10	µg/L
Bromomethane	ND	10	µg/L
Vinyl Chloride	ND	10	µg/L
Chloroethane	ND	10	µg/L
Methylene Chloride	ND	10	µg/L
Acetone	ND	10	µg/L
Carbon Disulfide	ND	10	µg/L
1,1-Dichloroethene	ND	10	µg/L
1,1-Dichloroethane	ND	10	µg/L
1,2-Dichloroethenes, total	ND	10	µg/L
Chloroform	ND	10	µg/L
1,2-Dichloroethane	ND	10	µg/L
2-Butanone	ND	10	µg/L
1,1,1-Trichloroethane	ND	10	µg/L
Carbon Tetrachloride	ND	10	µg/L
Bromodichloromethane	ND	10	µg/L
1,2-Dichloropropane	ND	10	µg/L
Cis-1,3-Dichloropropene	ND	10	µg/L
Trichloroethene	ND	10	µg/L
Dibromochloromethane	ND	10	µg/L
1,1,2-Trichloroethane	ND	10	µg/L
Benzene	ND	10	µg/L
Trans-1,3-Dichloropropene	ND	10	µg/L
2-Chloroethyl Vinyl Ether	ND	10	µg/L
Bromoform	ND	10	µg/L
4-Methyl-2-Pentanone	ND	10	µg/L
2-Hexanone	ND	10	µg/L
Tetrachloroethene	ND	10	µg/L
1,1,2,2-Tetrachloroethane	ND	10	µg/L
Toluene	ND	10	µg/L
Chlorobenzene	ND	10	µg/L
Ethylbenzene	ND	10	µg/L
Styrene	ND	10	µg/L
Xylenes, total	ND	10	µg/L

Units of µg/L are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Petroleum Hydrocarbons
GC/FID - EPA Method 8015 Modified

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7-EB-1
SPECTRALYTIX Sample ID: MET92-002-92050755 Sample Type: Water
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed : 05/30/92

Analyte	Result	Detection Limit	Units
Total Petroleum Hydrocarbons	ND	1.0	mg/L

Units of mg/L are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 625

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7-EB-1
SPECTRALYTIX Sample ID: MET92-002-92050755 Sample Type: Water
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Extracted: 05/27/92 Date Analyzed: 06/09/92

Analyte	Result	Detection Limit	Units
Phenol	ND	10	µg/L
Bis(2-Chloroethyl) Ether	ND	10	µg/L
2-Chlorophenol	ND	10	µg/L
1,3-Dichlorobenzene	ND	10	µg/L
1,4-Dichlorobenzene	ND	10	µg/L
1,2-Dichlorobenzene	ND	10	µg/L
2-Methylphenol	ND	10	µg/L
2,2'-Oxybis-(1-chloropropane)	ND	10	µg/L
4-Methylphenol	ND	10	µg/L
N-Nitroso-di-n-propylamine	ND	10	µg/L
Hexachloroethane	ND	10	µg/L
Nitrobenzene	ND	10	µg/L
Isophorone	ND	10	µg/L
2-Nitrophenol	ND	10	µg/L
2,4-Dimethylphenol	ND	10	µg/L
Bis(2-Chloroethoxy)methane	ND	10	µg/L
2,4-Dichlorophenol	ND	10	µg/L
1,2,4-Trichlorobenzene	ND	10	µg/L
Naphthalene	ND	10	µg/L
4-Chloroaniline	ND	10	µg/L
Hexachlorobutadiene	ND	10	µg/L
4-Chloro-3-methylphenol	ND	10	µg/L
2-Methylnaphthalene	ND	10	µg/L
Hexachlorocyclopentadiene	ND	10	µg/L
2,4,6-Trichlorophenol	ND	10	µg/L
2,4,5-Trichlorophenol	ND	50	µg/L
2-Chloronaphthalene	ND	10	µg/L
2-Nitroaniline	ND	50	µg/L
Dimethyl Phthalate	ND	10	µg/L
Acenaphthylene	ND	10	µg/L
3-Nitroaniline	ND	50	µg/L
Acenaphthene	ND	10	µg/L
2,4-Dinitrophenol	ND	50	µg/L
4-Nitrophenol	ND	50	µg/L
Dibenzofuran	ND	10	µg/L

ND = Compound not detected at or above the listed detection limit.

EPA-CLP Target Compound List
Semivolatile Organic Compounds - EPA Method 625
(continued)

SPECTRALYTIX Sample ID: MET92-002-92050755

Analyte	Result	Detection Limit	Units
2,4-Dinitrotoluene	ND	10	µg/L
2,6-Dinitrotoluene	ND	10	µg/L
Diethyl Phthalate	ND	10	µg/L
4-Chlorophenyl Phenyl Ether	ND	10	µg/L
Fluorene	ND	10	µg/L
4-Nitroaniline	ND	50	µg/L
4,6-Dinitro-2-methylphenol	ND	50	µg/L
N-Nitrosodiphenylamine	ND	10	µg/L
4-Bromophenyl Phenyl Ether	ND	10	µg/L
Hexachlorobenzene	ND	10	µg/L
Pentachlorophenol	ND	50	µg/L
Phenanthrene	ND	10	µg/L
Anthracene	ND	10	µg/L
Carbazole	ND	10	µg/L
Di-n-butyl Phthalate	ND	10	µg/L
Fluoranthene	ND	10	µg/L
Pyrene	ND	10	µg/L
Butylbenzyl Phthalate	ND	10	µg/L
3,3'-Dichlorobenzidine	ND	10	µg/L
Benzo(a)anthracene	ND	10	µg/L
Bis(2-Ethylhexyl) Phthalate	ND	10	µg/L
Chrysene	ND	10	µg/L
Di-n-octyl Phthalate	ND	10	µg/L
Benzo(b)fluoranthene	ND	10	µg/L
Benzo(k)fluoranthene	ND	10	µg/L
Benzo(a)pyrene	ND	10	µg/L
Indeno(1,2,3-cd)pyrene	ND	10	µg/L
Dibenz(a,h)anthracene	ND	10	µg/L
Benzo(g,h,i)perylene	ND	10	µg/L

Units of µg/L are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Organochlorine Pesticides/PCB's
EPA Method 8080

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7-EB-1
SPECTRALYTIX Sample ID: MET92-002-92050755 Sample Type: Water
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Extracted: 05/28/92 Date Analyzed: 06/02/92

Analyte	Result	Detection Limit	Units
alpha-BHC	ND	0.05	µg/L
beta-BHC	ND	0.05	µg/L
delta-BHC	ND	0.05	µg/L
gamma-BHC (Lindane)	ND	0.05	µg/L
Heptachlor	ND	0.05	µg/L
Aldrin	ND	0.05	µg/L
Heptachlor epoxide	ND	0.05	µg/L
gamma-Chlordane	ND	0.05	µg/L
Endosulfan I	ND	0.05	µg/L
alpha-Chlordane	ND	0.05	µg/L
Dieldrin	ND	0.1	µg/L
4,4'-DDE	ND	0.1	µg/L
Endrin	ND	0.1	µg/L
Endosulfan II	ND	0.1	µg/L
4,4'-DDD	ND	0.1	µg/L
Endosulfin sulfate	ND	0.1	µg/L
4,4'-DDT	ND	0.1	µg/L
Endrin ketone	ND	0.1	µg/L
Endrin aldehyde	ND	0.1	µg/L
Methoxychlor	ND	0.5	µg/L
Toxaphene	ND	5.0	µg/L
PCB-1016	ND	1.0	µg/L
PCB-1221	ND	1.0	µg/L
PCB-1232	ND	1.0	µg/L
PCB-1242	ND	1.0	µg/L
PCB-1248	ND	1.0	µg/L
PCB-1254	ND	1.0	µg/L
PCB-1260	ND	1.0	µg/L

Units of µg/L are equivalent to ppb.
ND = Compound not detected at or above the listed detection limit.

Total Metals

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7-EB-1
SPECTRALYTIX Sample ID: MET92-002-92050755 Sample Type: Water
Date Sampled : 05/22/92 Date Received: 05/23/92

Analyte	Result	Detection Limit	Units
Aluminum	ND	0.10	mg/L
Antimony	ND	0.0050	mg/L
Arsenic	ND	0.0020	mg/L
Barium	ND	0.050	mg/L
Berylium	ND	0.005	mg/L
Cadmium	ND	0.010	mg/L
Calcium	0.080	0.050	mg/L
Chromium	ND	0.020	mg/L
Cobalt	ND	0.025	mg/L
Copper	0.021	0.020	mg/L
Iron	ND	0.050	mg/L
Lead	ND	0.050	mg/L
Magnesium	0.012	0.050	mg/L
Manganese	ND	0.010	mg/L
Mercury	ND	0.00050	mg/L
Nickel	ND	0.025	mg/L
Potassium	1.1	0.050	mg/L
Selenium	0.0029	0.0020	mg/L
Silver	ND	0.020	mg/L
Sodium	2.2	0.050	mg/L
Thallium	ND	0.0050	mg/L
Vanadium	ND	0.025	mg/L
Zinc	ND	0.020	mg/L

Units of mg/L are equivalent to ppm.
ND = Analyte not detected at or above the listed reporting limit.

Cyanides
Via EPA Method 335.3

Client: METCALF & EDDY, INC./NASA D07
Client Sample ID: WFF7-EB-1
SPECTRALYTIX Sample ID: MET92-002-92050755 Sample Type: Water
Date Sampled : 05/22/92 Date Received: 05/23/92
Date Analyzed : 06/03/92

Analyte	Result	Detection Limit	Units
Cyanide (CN)	ND	0.01	mg/L

Units of mg/L are equivalent to ppm.
ND = Compound not detected at or above the listed detection limit.

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9208043-12A
Client ID: EQUIPMENT BLANK
Collected: 08/06/92
Dilution: 1

Matrix: WATER
Method: 40CFR136 608
Units: ug/L

Analyst: AD
Analyzed: 08/12/92
Prepared: 08/10/92

GC TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
4,4'-DDD	BQL	0.101	
4,4'-DDE	BQL	0.023	
4,4'-DDT	BQL	0.141	
Aldrin	BQL	0.010	
alpha-BHC	BQL	0.007	
Aroclor 1016	BQL	0.500	
Aroclor 1221	BQL	0.500	
Aroclor 1232	BQL	0.500	
Aroclor 1242	BQL	0.500	
Aroclor 1248	BQL	0.500	
Aroclor 1254	BQL	0.500	
Aroclor 1260	BQL	0.500	
beta-BHC	BQL	0.019	
Chlordane	BQL	0.140	
delta-BHC	BQL	0.005	
Dieldrin	BQL	0.032	
Endosulfan I	BQL	0.033	
Endosulfan II	BQL	0.043	
Endosulfan sulfate	BQL	0.125	
Endrin	BQL	0.030	
Endrin aldehyde	BQL	0.289	
Heptachlor	BQL	0.015	
Heptachlor epoxide	BQL	0.013	
Lindane (gamma-BHC)	BQL	0.010	
Toxaphene	BQL	1.00	

GP ENVIRONMENTAL SERVICES
WET CHEMISTRY ANALYSIS RESULTS

GP ID: 9208043-01A
Client ID: WFF7AF-SD10
Matrix: SOIL
Collected: 08/07/92

Parameter	Method	Result	Det.Lim.	Units	Dil.	Prepared	Analyzed By
Percent Solids	MCAWW 160.3	96.1		%			08/11/92 SCT

GP ID: 9208043-02A
Client ID: WFF7AF-SD3
Matrix: SOIL
Collected: 08/07/92

Parameter	Method	Result	Det.Lim.	Units	Dil.	Prepared	Analyzed By
Percent Solids	MCAWW 160.3	83.9		%			08/11/92 SCT

GP ID: 9208043-03C
Client ID: WFF7AF-SW1
Matrix: WATER
Collected: 08/07/92

Parameter	Method	Result	Det.Lim.	Units	Dil.	Prepared	Analyzed By
Total Cyanide	SOW390/335.2	BQL	10.0	ug/L	1		08/13/92 VM

GP ID: 9208043-04A
Client ID: WFF7AF-SW2
Matrix: WATER
Collected: 08/07/92

Parameter	Method	Result	Det.Lim.	Units	Dil.	Prepared	Analyzed By
Total Cyanide	SOW390/335.2	BQL	10.0	ug/L	1		08/13/92 VM

GP ID: 9208043-05B
Client ID: WFF7AF-SD2
Matrix: SOIL
Collected: 08/07/92

Parameter	Method	Result	Det.Lim.	Units	Dil.	Prepared	Analyzed By
Total Cyanide	SW846 9010	BQL	2.65	mg/Kg	1		08/13/92 VM
Percent Solids	MCAWW 160.3	75.4		%			08/11/92 SCT

GP ID: 9208043-06B
Client ID: WFF7BA-SD1
Matrix: SOIL
Collected: 08/07/92

Parameter	Method	Result	Det.Lim.	Units	Dil.	Prepared	Analyzed By
Total Cyanide	SW846 9010	BQL	4.30	mg/Kg	1		08/13/92 VM

GP ENVIRONMENTAL SERVICES
WET CHEMISTRY ANALYSIS RESULTS

GP ID: 9208043-06B
Client ID: WFF7BA-SD1
Matrix: SOIL
Collected: 08/07/92

Parameter	Method	Result	Det.Lim.	Units	Dil.	Prepared	Analyzed By
Percent Solids	MCAWW 160.3	46.4		%			08/11/92 SCT

GP ID: 9208043-07A
Client ID: WFFF7BA-SW1
Matrix: WATER
Collected: 08/07/92

Parameter	Method	Result	Det.Lim.	Units	Dil.	Prepared	Analyzed By
Total Cyanide	SOW390/335.2	BQL	10.0	ug/L	1		08/13/92 VM

GP ID: 9208043-08A
Client ID: WFF7-FT-SD1
Matrix: SOIL
Collected: 08/06/92

Parameter	Method	Result	Det.Lim.	Units	Dil.	Prepared	Analyzed By
Percent Solids	MCAWW 160.3	90.3		%			08/11/92 SCT

GP ID: 9208043-09A
Client ID: WFF7-FT-SD2
Matrix: SOIL
Collected: 08/06/92

Parameter	Method	Result	Det.Lim.	Units	Dil.	Prepared	Analyzed By
Percent Solids	MCAWW 160.3	91.3		%			08/11/92 SCT

GP ID: 9208043-10A
Client ID: WFF7-FT-SD3
Matrix: SOIL
Collected: 08/06/92

Parameter	Method	Result	Det.Lim.	Units	Dil.	Prepared	Analyzed By
Percent Solids	MCAWW 160.3	89.4		%			08/11/92 SCT

GP ID: 9208043-11A
Client ID: WFF7-FT-SD4
Matrix: SOIL
Collected: 08/06/92

Parameter	Method	Result	Det.Lim.	Units	Dil.	Prepared	Analyzed By
Percent Solids	MCAWW 160.3	86.2		%			08/11/92 SCT

GP ENVIRONMENTAL SERVICES
ORGANIC ANALYSIS RESULTS

GP ID: 9208043-13A
Client ID: TRIP BLANK
Collected: 08/06/92
Dilution: 1

Matrix: WATER
Method: 40CFR136 624
Units: ug/L

Analyst: YY
Analyzed: 08/12/92
Prepared:

VOLATILE TARGET COMPOUNDS

Parameter	Result	Det.Lim.	Qualifier
1,1,1-Trichloroethane	BQL	5.00	
1,1,2,2-Tetrachloroethane	BQL	5.00	
1,1,2-Trichloroethane	BQL	5.00	
1,1-Dichloroethane	BQL	5.00	
1,1-Dichloroethene	BQL	5.00	
1,2-Dichlorobenzene	BQL	10.0	
1,2-Dichloroethane	BQL	5.00	
1,2-Dichloropropane	BQL	5.00	
1,3-Dichlorobenzene	BQL	10.0	
1,4-Dichlorobenzene	BQL	10.0	
2-Chloroethylvinyl ether	BQL	10.0	
Benzene	BQL	5.00	
Bromodichloromethane	BQL	5.00	
Bromoform	BQL	5.00	
Bromomethane	BQL	10.0	
Carbon Tetrachloride	BQL	5.00	
Chlorobenzene	BQL	5.00	
Chloroethane	BQL	10.0	
Chloroform	BQL	5.00	
Chloromethane	BQL	10.0	
cis-1,3-Dichloropropene	BQL	5.00	
Dibromochloromethane	BQL	5.00	
Ethyl Benzene	BQL	5.00	
Methylene Chloride	1.66	5.00	J
Tetrachloroethene	BQL	5.00	
Toluene	BQL	5.00	
trans-1,2-Dichloroethene	BQL	5.00	
trans-1,3-Dichloropropene	BQL	5.00	
Trichloroethene	BQL	5.00	
Trichlorofluoromethane	BQL	10.0	
Vinyl Chloride	BQL	10.0	