3732 Charter Park Drive
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BENCHMARK

ASBESTOS SURVEY REPORT

Community Storage
(ID: Building 82)

NASA-AMES
Moffett Field
Mt. View, CA 94035

BUILDING INSPECTIONS

ENVIRONMENTAL ENGINEERING

SPECIALIZED TRAINING

CONTRACT MANAGEMENT

Prepared for:
NASA - AMES (PAI CORPORTATION)
Nasa-ames Research Center
Moffett Field, CA 94035-1000

Prepared by:
Benchmark Environmental Engineering
November 8, 2001
Project Number: **E01-448-A-SU**

Prepared By:

Terri MacFarlane
a California Certified Asbestos Consultant
90-2747

Reviewed By:

Terri MacFarlane
a California Certified Asbestos Consultant
90-2747

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Executive Summary

Benchmark Environmental Engineering (Benchmark) was retained by NASA - Ames (PAI Corportation) to perform an Asbestos Hazard Emergency Response Act (AHERA) style asbestos survey of the Community Storage (Building ID: Building 82), to determine the locations of accessible and to the extent feasible, inaccessible friable and non-friable asbestos containing building materials (ACBM).

This inspection included interior and exterior areas. Pre-existing survey data was used to help provide a picture of existing condition of this building. Benchmark collected additional samples of the construction material to help supplement existing data, to contradict existing data or to provide additional data of materials not perviously identified.

No friable asbestos-containing materials were observed in the building.

Asbestos was detected in the following non-friable materials:

Roofing Material

Section 1 Introduction

Benchmark Environmental Engineering (Benchmark) performed an Asbestos Hazard Emergency Response Act (AHERA) style asbestos survey of the Community Storage located at Moffett Field, Mt. View, CA, to identify ACBM. This report identifies the locations and asbestos content of friable and non-friable ACBM, provides assessment of the friable ACBM in relation to the material's hazard potential to building occupants and provides removal cost estimates.

This inspection included interior and exterior areas. Pre-existing survey data was used to help provide a picture of existing condition of this building. Benchmark collected additional samples of the construction material to help supplement existing data, to contradict existing data or to provide additional data of materials not perviously identified.

All identified suspect asbestos-containing materials are summarized in Section 3. Materials testing positive for asbestos including material assessments, recommended response actions, and quantities are described in Section 4. Removal cost estimates for asbestos-containing materials are included in Section 5.

Removal cost estimates (Section 5) are for budgeting purposes only and should not be used as a quote for removal of the materials. It is not our recommendation to remove these materials unless they are beyond repair, or planned demolition or renovation activities will disturb the materials. Estimates are based on recent pricing we have received from contractors performing similar work and may vary from actual prices obtained due to the actual scope of work, quantity of material removed, control measures specified and contractor work loads.

On Wednesday, August 1, 2001 Terri MacFarlane (90-2747) , a California Certified Asbestos Consultant and Roy J. Mabus (92-0191) , a California Certified Asbestos Consultant, from Benchmark, performed an asbestos survey of the building(s) in accordance with the Asbestos Hazard and Emergency Response Act of 1987 (AHERA).

DISCLAIMER

This report is prepared for the express use and benefit of NASA - Ames (PAI Corportation), its agents and employees. The information in this report or portions thereof may be required to be included in notifications to employees, contractors or other visitors to the building(s). This report is not intended to be used as a specification or work plan for any of the work suggested or recommended in this report.

This report is based upon conditions observed at the property and information made available to the surveyor. This report does not intend to identify all hazards or unsafe

available to the surveyor. This report does not intend to identify all hazards or unsafe conditions, nor to indicate that other hazards or unsafe conditions do not exist at the premises.

Section 2 Description of Building Construction and Systems

Number of Floors: 1 **Year Built:** 1944 **Total Square Footage:** 580

Exterior Wall construction components consist of: Metal

Building Description/Comments:

This building is a corrugated steel-frame Quonset hut with no foundation. The metal exterior is tan. This facility was built in 1944.

Comments:

Tetra Tech, Inc. did an asbestos survey on this facility in September of 1993.

Section 3 Summary of Findings for Suspect Materials

The following table is a list of all materials at this building which were tested for the presence of asbestos or were assumed to contain asbestos along with overall sample results. Complete information on asbestos containing materials is included in Section 4 of this report.

Each unique material within the building is assigned a unique HM number by the surveyor at the time the survey is performed.

Section 3 and Section 4 are organized by building, surfacing, thermal systems insulation, flooring, walls, ceilings, roofing and miscellaneous materials.

Site Information
Community Storage (Site ID: Parcel 5)
Moffett Field
Mt. View, CA 94035

Client Information
NASA - Ames (PAI Corportation)
NASA-Ames Research Center
Moffett Field, CA 94035-1000

Survey Performed By	*Inspector*	*Inspection Date*	*Job Number*
Benchmark Environmental Engineering	Terri MacFarlane	Wednesday, August 1, 2001	E01-448-A-SU

Suspect Material	*Category*	*HM Number*	*Material Location(s)*	*Asbestos Present?*
Roofing Material Sealant	Roofing	RM-1		Yes

Section 4 Material Information Tables

Site Information
Community Storage (Site ID: Parcel 5)
Moffett Field
Mt. View, CA 94035

Client Information
NASA - Ames (PAI Corportation)
NASA-Ames Research Center
Moffett Field, CA 94035-1000

Survey Performed By	*Inspector*	*Inspection Date*	*Job Number*
Benchmark Environmental Engineering	Terri MacFarlane	Wednesday, August 1, 2001	E01-448-A-SU

Material Description: **Roofing Material Sealant** | *Material Number*: **RM-1** | *Asbestos Present?*: **Yes**

Material Category	*Friable Classification*	*EPA Category*	*Total Quantity*	*Unit of Measure*
Roofing	Non-Friable	Category I	20	Square Feet

General Condition	*Damage Category*	*Overall Material Assessment*	*Recommended Response*
		Not Assessed under AHERA	Abate Prior to Demolition

General Material Comments

Material Location(s)

Sample ID(s)	*Sample Location(s)*	*Floor*	*Analyzed*	*Overall Result*	*Layer(s) Reported by Lab*	*Results by Layer*
RM-1-01-4860-82-1	Exterior West		Yes	35%	1) Roofing material 2) 3)	35 % Chrysotile
RM-1-01-4861-82-2	Exterior Middle		Yes	35%	1) Roofing material 2) 3)	35 % Chrysotile
RM-1-01-4862-82-3	Exterior East		Yes	35%	1) Roofing material 2) 3)	35 % Chrysotile

Section 5 Removal Cost Estimate Summary

These estimates are for budgeting purposes only and should not be used as a quote for removal of the materials. It is not our recommendation to remove these materials unless they are beyond repair, or planned demolition or renovation activities will disturb the materials. Estimates are based on recent pricing we have received from contractors performing similar work and may vary from actual prices obtained due to the actual scope of work, quantity of material removed, control measures specified and contractor work loads, etc.

Building Community Storage

HM	EPA Category	Suspect Material	Material Location	QTY. Units Removal Costs (low to high)
1	Category I	Roofing Material Sealant		20 Square Feet $500

Total Removal Costs: $500 to $500

Building	Floor	Sample #	Sample Location	Room #	Material Sampled	% and Type
82		01-4860-82-1	Exterior West		Roofing Material Sealant	35% Chrysotile
82		01-4861-82-2	Exterior Middle		Roofing Material Sealant	35% Chrysotile
82		01-4862-82-3	Exterior East		Roofing Material Sealant	35% Chrysotile

Appendix A

Definitions of Terms and Assessment Criteria

Definitions of Terms and Assessment Criteria

This survey report organizes information on each suspect ACBM identified in tables located in Section 4. This section describes how to interpret the data found on materials listed in Section 4.

Material description contains the description of the suspect homogeneous asbestos containing building material.

Material Serial Number is used to reference the material for reinspections, etc..

Asbestos type and content describes the type of asbestos and its percentage in the material.

Asbestos Results for positive materials are shown as a percentage. Samples having less than 1% asbestos are reported as containing "Trace" amounts of asbestos and samples with no detected asbestos are reported as "BLD" or below limit of detection.

Sample number(s) identifies a particular material sample obtained from a specific sample location. Sample numbers are used primarily for laboratory identification.

Sample Location identifies where the samples of this material were obtained.

Material Category categorizes each material as surfacing, TSI or miscellaneous.
Surfacing Materials - Asbestos containing materials that are sprayed-on, trowled-on or otherwise applied to surfaces, such as acoustical plaster on ceilings and fireproofing on structural members, or other materials on surfaces for acoustical, fireproofing, or other purposes.

Thermal Systems Insulation (TSI) - Asbestos containing materials applied to pipes, fittings, boilers, breaching, tanks, ducts or other interior structural components to prevent heat loss or gain or water condensation.

Miscellaneous Materials - Asbestos containing materials applied to or a part of building components that are not classified as surfacing materials or thermal systems insulation.

Quantity & Units reports approximate total quantity per unit of measure for each material.

Building(s) & Floor(s) specifies where a material is located.

Material Location describes where the material is found throughout the building.

Material Condition identifies the material as Friable, Non-friable or Jacketed (for thermal systems insulation only) if asbestos is present.

Friable - An asbestos containing material that can be crumbled, pulverized or reduced to powder, when dry, by hand pressure, such as spray applied fireproofing on structural steel members, spray applied acoustical ceiling materials or damaged thermal systems insulation. Friable materials are of greatest concern due to their potential fiber release.

Non-Friable - An asbestos containing material where the asbestos is bound tightly in a matrix or sealed by a protective layer. Non-friable materials can become friable by being rendered to a crumbled, pulverized or powdered state, when dry, by crushing, sanding, sawing, shot-blasting, severe weathering or by other mechanically induced means. Common examples of non-friable materials are adhesives, floor tiles, transite and roofing materials.

Jacketed - An asbestos containing material applied to thermal systems insulation and "jacketed" with a protective outer layer such as canvas or metal to keep the material in good condition. Undamaged jacketed ACBM is considered non-friable. If the jacketing is damaged, the material is considered friable.

Damage Category describes the type of damage, if any, to the material. The following damage categories are used: None, Physical, Air, and Water.

Material Assessment identifies the condition of the material in relation to physical and water damage, delamination of the material from its substrate, the extent of the damage and the potential for damage from building conditions, such as, accessibility by building occupants, influence of vibration, etc. The six standard assessment categories ranked by hazard potential, with the first being the lowest hazard are as follows: 1) Potential for Damage, 2) Potential for Significant Damage, 3) Damaged, 4) Damaged with Potential for Damage, 5) Damaged with Potential for Significant Damage, and 6) Significantly Damaged. Only friable materials are assessed under AHERA regulations. Non-friable materials, unless damaged, are not assessed and can be assumed to be in good condition.

Damaged - The damage or deterioration of the material results in inadequate cohesion or adhesion with crumbling, blistering, water stains, marring or otherwise abraded over less than on-tenth (1/10) of the surface if the damage is evenly distributed or one-fourth (1/4) if the damage is localized.

Significant Damage - The damage or deterioration of the material results in inadequate adhesion or cohesion and the damage is extensive and severe with one or more of the following characteristics: 1) Crumbling or blistering over at least one-tenth (1/10) of the surface if evenly distributed, one-fourth (1/4) if the damage is localized; 2) Areas of the material hanging from the surface, delaminated, or showing adhesive failure; 3) Water stains, gouges or marred.

Recommended Response suggests the appropriate options for controlling or maintaining ACBM in a safe manner. There are four options used:
Operations & Maintenance (O&M) - A program designed to "manage" asbestos in-place. As long as asbestos containing materials remain in a building, an O&M program should be instituted to alert maintenance personnel, custodial workers and outside vendors of the existence and location of these materials and to set a policy for the maintenance of these materials. The material is usually only required to be removed if it is significantly damaged, prior to demolition of the building or if it will be disturbed by renovation activities.

Repair - The restoration of damaged or deteriorated asbestos containing building materials to an intact condition. Once the intact condition is established, the material should be included in an O&M program. The material is usually only required to be removed if it is significantly damaged, prior to demolition of the building or if it will be disturbed by renovation activities.

Abate Due to Condition - This material is significantly damaged and is unsafe in its current condition. The access to the area should be restricted to personnel equipped with appropriate personal protection. This material should be properly removed by a licensed contractor using workers trained in the safe removal of asbestos.

Abate Prior to Renovation - This material should be properly removed prior to planned renovation activities by a licensed contractor using workers trained in the safe removal of asbestos. This recommendation is usually made only on survey reports prepared prior to planned renovation activities.

Comments & Damage Description contains any additional information and or specific details of material damage are noted here.

EPA Category provides the appropriate material category as outlined in the NESHAPS regulation. The four options are friable, Category 1, Category 2, and needs determination.

Friable - Materials containing greater than 1% asbestos are always considered Regulated Asbestos Containing Materials

Appendix B

Bulk Sampling Protocol and Analytical Methods

Bulk Sampling Protocol and Analytical Methods

Bulk samples of suspect asbestos containing building materials were obtained using standard industrial hygiene techniques including wetting the material to minimize fiber release. Our personnel wore half-face air purifying respirators equipped with high efficiency particulate (HEPA) filters while obtaining samples

Our sampling strategy for suspect friable surfacing materials was based on the guidelines outlined in the EPA publication Asbestos in Buildings: Simplified Sampling Scheme for Friable Surfacing Materials, and the procedures outlined in 40 CFR 763, Subpart E (AHERA). For non-friable suspect materials, AHERA requires the building inspector to determine the appropriate number of samples to obtain and analyze. Usually one to three samples of non-friable materials are collected.

For each homogeneous material identified by visual inspection as suspect material, random samples are obtained. A single bulk sample is randomly selected from each homogeneous material for first-round testing. If the sample is positive, the remaining samples are not analyzed; if the sample is negative, the other samples are submitted for study. Every sample must be reported negative if the material is to be considered non-asbestos containing.

The bulk samples were delivered to an independent laboratory that participates in the bulk sample proficiency analysis program conducted by the United States Environmental Protection Agency and is accredited by the National Voluntary Laboratory Program (NVLAP). The samples were analyzed using Polarized Light Microscopy (PLM) with dispersion staining to estimate the percent of asbestos composition by volume. Samples with no observable asbestiform minerals are designated as None-Detected. Samples in which asbestiform minerals are observed, but exist in concentrations of less than one percent (<1%), are designated as present in Trace amounts; all other samples are designated as asbestos containing with the appropriate percent of asbestos noted.

Appendix C

Laboratory Bulk Sampling Reports

SCHNEIDER LABORATORIES

INCORPORATED

2512 W. Cary Street • Richmond, Virginia • 23220-5117
804-353-6778 • 800-785-LABS (5227) • (FAX) 804-353-6928
Excellence in Service and Technology
AIHA/ELLAP 100527, NVLAP 1150, NYELAP 11413, CAELAP 2078, NC 593, SC 93003

LABORATORY ANALYSIS REPORT

Asbestos Identification by EPA Method 600/R-93/116

ACCOUNT: 2541-01-104
CLIENT: Benchmark
ADDRESS: 3732 Charter Park Drive
San Jose, CA 95136

PO NO.:
PROJECT NAME:
PROJECT NO.: E01-448-A-SU
JOB LOCATION: Parcel S, Bldg 82

DATE COLLECTED:
DATE RECEIVED: 8/24/2001
DATE ANALYZED: 8/25/2001
DATE REPORTED: 8/27/2001

Client Sample No.	SLI Sample/ Layer ID	Sample Identification/ Layer Name	Asbestos Detected (Yes/No)	Sample Description
01-486082-1	2027550	Ext West		
	Layer 1:	Caulk	**Yes**	Gray, Granular
	35% Asbestos		CHRYSOTILE 35%	
	65% Non-Asbestos		CELLULOSE FIBER 3%, NON FIBROUS MATERIAL 62%	
01-486182-2	2027551	Ext Middle		
	Layer 1:	Caulk	**Yes**	Gray, Granular
	35% Asbestos		CHRYSOTILE 35%	
	65% Non-Asbestos		CELLULOSE FIBER 5%, NON FIBROUS MATERIAL 60%	
01-486282-3	2027552	Ext East		
	Layer 1:	Caulk	**Yes**	Gray, Granular
	35% Asbestos		CHRYSOTILE 35%	
	65% Non-Asbestos		CELLULOSE FIBER 3%, NON FIBROUS MATERIAL 62%	

ANALYST: JONNELLE G. HARGROVE
Total no. of pages in report = /

REVIEWED BY **Beverly A. Schrage, Analyst**

Samples analyzed by the EPA Test Method are subject to the inherent limitations of light microscopy including interference by matrix components. Gravimetric reduction and correlative analyses are recommended for all non-friable, organically bound materials. For calibrated visual estimate, 1% is the concentration at which there is a quantitative uncertainty. This report relates only to the items tested, must not be reproduced except in full with the approval of the lab, and must not be used to claim NVLAP or other government agency endorsement.

2SC(1-01-K2

BENCHMARK

Sample Location Works[illegible]
Chain Of Cus[illegible]

3680 Charter Park Dr Suite E San Jose, CA 95136
(408) 448-7594 (408) 448-3849 (fax)

Project Number: C01-448-A56 Date: ____________ Technician: ____________

Project Location: Parcel 5, Bldg 82

Client Name: Kris Company: NASA

Project Type	Type Of Analysis	Turnaround Time
(Asbestos)	(PLM/Bulk (EPA 600))	Same Day 3 Hr 6 Hr
Lead-based Paint	EPA SW846-7420, FLAA	24 Hour
Lead Risk Assessment	Dust Wipes, Paint Chips	(48 Hour)
Lead (water)	Air, Soil	72 Hour
Mold/Fungus/Bacteria	SM313B, GFAA, Water	5 Day
Indoor Air Quality	TEM/Bulk (Chatfield)	Other: ____________
Other: ____________	Other: ____________	TTP = Test Till Positive

Homogenous Material Group	Material / Component	Sample Number	Location Of Samples	Analysis Specification
	ROOF CAULK	01-486082-1	EXT. WEST ROOFING CAULK	
		01-486082-2	EXT. MIDDLE ROOFING CAULK	
		01-486082-3	EXT. EAST ROOFING CAULK	

Relinquished By:	Received By:	Date/Time Received
T-[illegible]	[illegible] UPS 1Z2E28992[illegible]10132194 (R)	8/24/01 945

Appendix D

Summary of Regulatory Requirements

Appendix D Summary of Regulatory Requirements

This appendix provides a summary of building owner and manager requirements under various asbestos regulations promulgated by the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA) to protect building occupants and employees from exposure to asbestos.

Survey Requirements

Prior to any renovation activity, OSHA and EPA regulations require that a complete asbestos survey be performed to determine if asbestos is present in any suspect asbestos containing material that will be present in the construction or work area. This survey report addresses accessible materials. It is recommended that prior to renovation activites, inaccessible areas that could contain asbestos materials be inspected.

Notification and Posting Requirements

Regulatory agencies feel that the building owner or manager should be responsible for knowing and communicating the locations of asbestos in their buildings to building employees, outside contractors and tenants to prevent exposure to asbestos.

Under the California Health and Safety Code, building owners and managers are required to provide annual notifications regarding known asbestos containing materials in their buildings to building employees, tenants, vendors and outside contractors. Therefore, specific information contained in this survey report is required to be included in the notification.

OSHA requires building employees, outside contractors, vendors and construction contractors bidding on or performing work in buildings be provided with notification regarding asbestos containing materials in their work areas. OSHA also requires that asbestos warning signs be posted in mechanical rooms.

Removal Requirements

Under EPA regulations, asbestos containing materials must be properly removed by licensed asbestos abatement contractors prior to renovation or demolition activities that would disturb friable materials or cause non-friable materials to become friable and a regulated material.

Repair of Damaged Materials and Cleanup of Debris

OSHA requires that asbestos containing debris be immediately cleaned up. It is recommended that damaged materials that may release fibers be repaired as soon as possible to prevent fiber release and potential exposures.

Training Requirements

OSHA requires employers whose employees are likely to or required to disturb asbestos to receive an asbestos training course. Refresher training is required to be provided annually.

Appendix E

AHERA Building Inspector Certifications

State of California
Division of Occupational Safety and Health

Certified Asbestos Consultant

Terri A. MacFarlane

Name

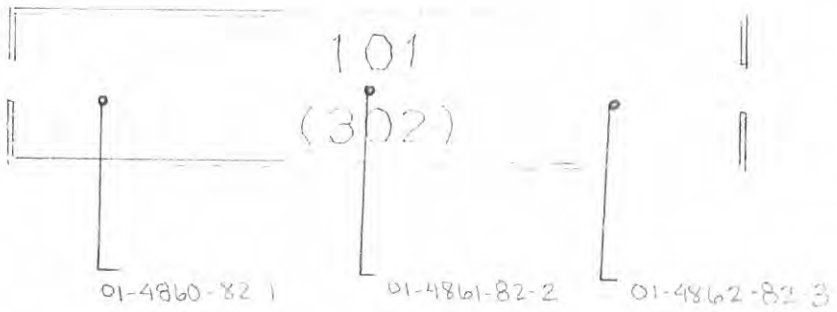
Certification No. **90–2747**

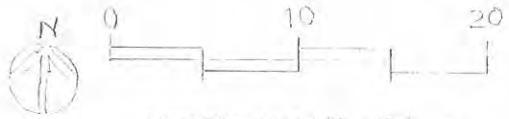
Expires on **5/3/2002**

This certification was issued by the Division of Occupational Safety and Health as authorized by Sections 7180 et seq. of the Business and Professions Code.

Appendix F

Drawings Indicating Sampling Locations





APPROXIMATE SCALE

BENCHMARK

Property Inspections - Environmental Engineering
Specilized Training - Contract Management
3732 - A Charter Park Drive
San Jose, CA 951366
Phone: (408) 448-7594 - Fax: (408) 448-3849

PROJECT NAME:
PARCEL 5
BUILDING 82
NASA- AMES

DRAFT PERSON:	DATE:	DWG. No.
WLB	10/30	1

PROJECT No.
E01-448-AL-50