Former American Beryllium Company Decontamination and Abatement of Beryllium Impacted Materials Final Report

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A Laboratory Data Reports

Section 1 Introduction

On behalf of Lockheed Martin Corporation (Lockheed Martin), Tetra Tech, Inc. has prepared the following report documenting the abatement of beryllium-impacted materials and building surfaces at Lockheed Martin's former American Beryllium Company (ABC) facility in Tallevast, Florida. Beryllium residues detected in various building materials within Buildings 1, 2, 3, 4, and 5 of the ABC facility were abated (by removal or decontamination) in order to reduce potential airborne beryllium hazards that may occur during future occupancy of the facility. The abatement program was coordinated with Law Environmental, Inc., on behalf of Waters, Telsey, and Puma, Inc. (WTP), for concurrence that the property was considered suitable for occupancy. The primary objectives of the abatement program were as follows:

- Remove and dispose of beryllium-impacted ceiling materials (tiles, grid, insulation), HVAC ductwork, air handlers, and carpets in accordance with appropriate federal and state disposal criteria;
- 2. Decontaminate interior building surfaces in order to reduce beryllium surface wipe concentrations to below 25 μ g/ft²;
- 3. Ensure that no airborne concentrations within the buildings exceed OSHA's 0.002 mg/m³ Permissible Exposure Limit (PEL) following abatement.

This report summarizes the abatement activities in December 1999 through February 2000 and presents the surface wipe and air sample data collected following abatement. Clearance sampling data indicate that beryllium abatement objectives have been attained.

In addition to beryllium abatement, this report also documents the removal of chromium impacted plating ductwork in Building 5. Following decontamination and removal of the ductwork, the plating shop building surfaces were decontaminated. Building surfaces were then sampled and analyzed for total chromium. No regulatory surface wipe criteria are available for for chromium.

This abatement report has been organized into the following sections:

- <u>Section 2</u> Site Background, presenting background information on facility conditions, baseline beryllium analytical data, interim beryllium abatement sampling results, and facility-wide beryllium assessment sampling results;
- Section 3 Evaluation of Published Regulatory Standards, reviewing available regulatory standards and establishing appropriate beryllium and chromium standards to be used during the decontamination and abatement project;
- Section 4 Beryllium Abatement Program, presenting the approach used to identify
 materials requiring abatement; evaluate the extent of abatement; decontaminate and abate
 beryllium-impacted materials; and, perform final clearance sampling to verify that
 cleanup goals have been attained;
- Section 5 Conclusions, presenting conclusions derived from the abatement program;
- Section 6 References, presenting a list of previous reports referenced in this final report.

Copies of the surface wipe and air clearance sampling laboratory data and chain-of-custody records are presented in Appendix A.

Section 2

Site Background

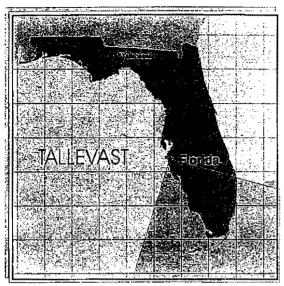
This section provides site information, including a description of the location, past operations of the facility, and a summary of data collected at the facility prior to the final beryllium abatement activities.

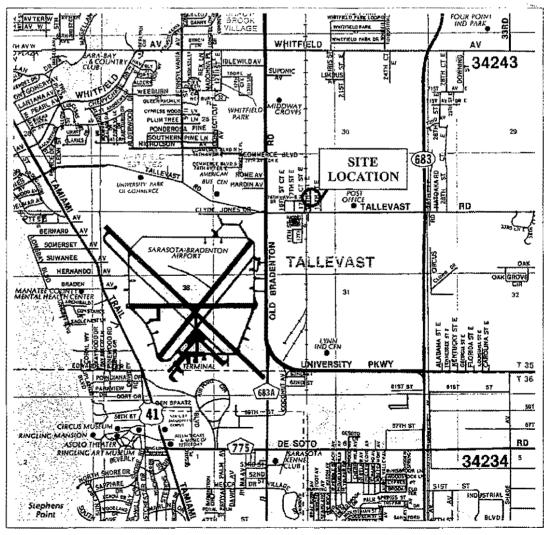
2.1 FACILITY DESCRIPTION

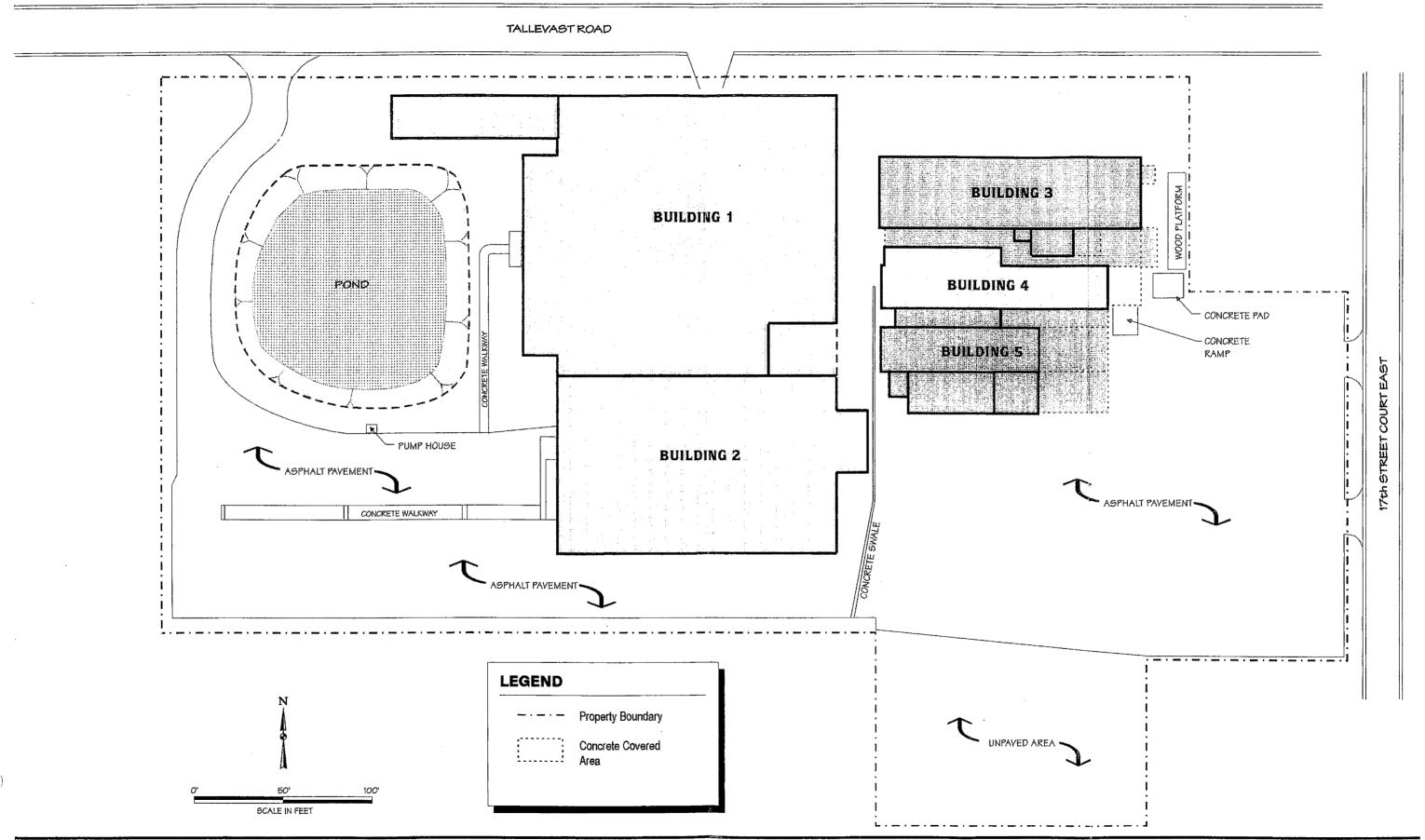
The former ABC facility is located at 1600 Tallevast Road in Tallevast, Manatee County, Florida - See Figure 2-1. The property consists of 5.167 acres of land including approximately 66,335 square feet of buildings and covered areas. The former ABC facility was used primarily as an ultra-precision machine parts manufacturing plant. The facility operations consisted of a machining and fabricating plant where metals including beryllium were milled, lathed, and drilled into various components. Operations at the former ABC facility were discontinued on September 27, 1997. The property is currently in the process of being converted to a non-beryllium use facility.

The facility consists of five main buildings, the largest of which is Building 1, followed in decreasing order of size by Buildings 2, 3, 5 and 4. Buildings 1, 2, and 3 were used for machining and inspection; Building 4 was used for wood working and material storage; and Building 5 was used for plating and anodizing, wastewater treatment, and material storage. Figure 2-2 presents an overview of the former ABC facility. Current floor plans for the major building areas are provided in Section 4.

FIGURE 2-1 SITE LOCATION MAP







2.2 SUMMARY OF DATA COLLECTED PRIOR TO FINAL ABATEMENT

Data collected prior to the final beryllium abatement activities at the former ABC facility include (1) baseline assessments of the Buildings 1, 2, and 3 beryllium machining areas. (2) interim abatement activities at the Buildings 1, 2 and 3 beryllium machining areas, and (3) the facility-wide beryllium assessment.

2.2.1 Baseline Assessments of Buildings 1, 2, and 3 Beryllium Machining Areas

In November 1996, Tetra Tech collected 28 wipe samples from various beryllium-machining areas to evaluate the potential presence and concentration of beryllium residues within the facility. Wipe samples were collected from residues on doors, walls, floors and other surfaces located in Buildings 1, 2 and 3. Beryllium was detected in all 28 samples at a maximum concentration of 871 μ g/ft². Wipe sampling was not performed in Buildings 4 and 5.

Over a 4-day period from December 2 to 5, 1996, a total of 68 air samples were collected at the ABC facility to determine if beryllium was present in the breathing zone. The air samples were analyzed in accordance with National Institute of Occupational Safety and Health (NIOSH) Method 7300. Beryllium was not detected in any of the 68 samples collected from the site.

During a Facility Assessment conducted in June 1997, Tetra Tech collected 78 additional wipe samples from various equipment and features associated with the former beryllium machining operations. Wipe samples were collected from various ceiling materials (including ceiling tiles, grid, insulation), PVC pipe vacuum collection systems, and exhaust stacks in Buildings 1, 2, and 3. Additional wipe samples were collected from various floor drains and sumps located in Buildings 4 and 5 (only buildings with sumps and floor drains present). Beryllium was detected in all 78 wipe samples ranging from 4.1 to 120,000 µg/ft².

2.2.2 Interim Abatement and Decontamination of Buildings 1, 2, and 3 Beryllium Machining Areas

In September and October 1999, Tetra Tech conducted abatement of identified beryllium-impacted building materials within the Buildings 1, 2, and 3 machine shop areas to a self-determined cleanup level of $46.5 \,\mu\text{g/ft}^2$. Three mechanical rooms in Building 1 were included in the abatement. In addition, six sumps and floor drains within Buildings 4 and 5 that reported beryllium above $46.5 \,\mu\text{g/ft}^2$ were also flushed and decontaminated. Abatement actions consisted of the following:

- Removal of all ceiling materials, including drop ceiling tiles, grid, and insulation. HVAC ductwork was not removed;
- Removal of beryllium dust vacuum piping and exhaust stacks;
- Decontamination of all interior surfaces, including walls, floors, and exterior ceiling materials (light fixtures, HVAC ductwork). Interior HVAC ductwork was not decontaminated;
- Decontamination of six floor drains and sumps within Buildings 4 and 5.

Bulk materials were packaged (single bagged in six-millimeter thick polyethylene) and stored in a storage bin in preparation for disposal. Disposal was conducted in accordance with applicable federal regulations stated in 40 CFR Part 261 and state regulations provided in the Florida Administrative Code (FAC). In accordance with CFR and FAC waste classification criteria, the beryllium impacted materials and wastewater was not defined as a hazardous waste – see Section 3. Beryllium-impacted materials were transported and disposed of at the Manatee County landfill.

Interior building surfaces were decontaminated using pressure wash or wipe down methods. Decontamination water was transported as a non-hazardous waste to Clark Environmental's permitted treatment and recycling facility located in Mulberry, Florida.

Abatement was conducted in these areas until beryllium concentrations were reduced to below a surface wipe limit of 46.5 µg/ft². A summary description of the building areas, the method of

abatement (decontamination or removal), and the beryllium concentration ranges reported in the surface wipe samples is presented in Table 2-1.

Table 2-1
Summary of Interim Beryllium Abatement Program

Building Feature	Location	Abatement Action	Final Surface Wipe Concentration Range (μg/ft²)
Ceiling Tile, Grid and Fiberglass	Building 1 Building 2 Building 3	Removal	Not Applicable
Other Ceiling Materials (light fixtures, exterior ductwork, etc.)	Building 1 Building 2 Building 3	Decontamination	ND – 20.0 ND – 2.45
Exhaust Stacks / Piping	Building 1 Building 2 Building 3	Removal	Not Applicable
Walls	Building 1 Building 2 Building 3	Decontamination	ND - 40.4 ND - 32.8 ND - 1.01
Floors	Building 1 Building 2 Building 3	Decontamination	ND – 46.4 ND – 36.4 ND – 15.5
Building 5 Floor Drains	Floor Drain No.2 Floor Drain No.3 Floor Drain No.4	Decontamination	44.8 22.5 7.92
Building 5 Sumps	Sump No. 1 Sump. No.3 Sump No. 5	Decontamination	12.3 4.99 16.1

Air samples were collected from the abatement areas following the interim decontamination and surface wipe sampling. A total of five air samples were collected from Buildings 1, 2 and 3 (two samples from each building). Beryllium was not detected in any of the air samples.

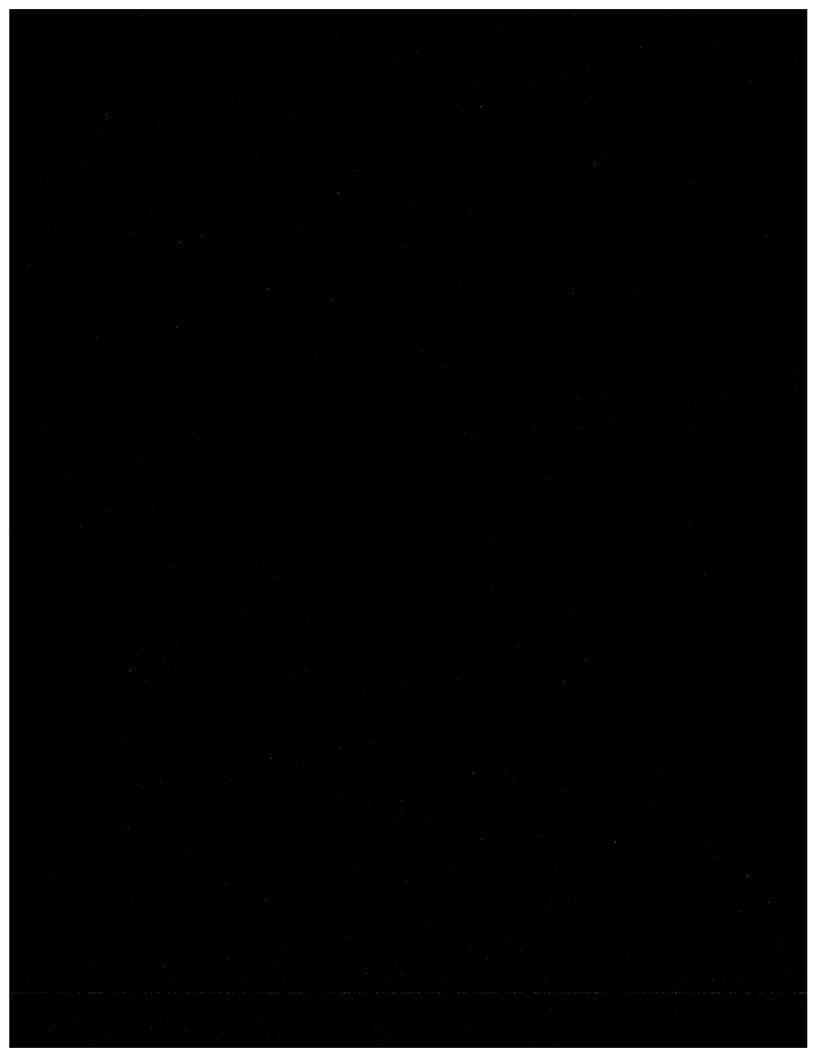
2.2.3 Facility-Wide Beryllium Assessment

From September through November 1999, additional beryllium assessment was conducted in other areas of the former ABC facility where no data had previously been collected. Areas and building materials that were sampled for beryllium included the air conditioning system (supply and return ductwork and air handlers), office areas, mechanical rooms, Buildings 4 and 5, and the former Lancy treatment system and waste storage yards. A summary of the areas that were assessed and the beryllium concentration range in the materials is presented in Table 2-2.

Table 2-2
Summary of Facility-Wide Beryllium Assessment

Building	Area	Material	Number of	Surface Wipe
			Samples	Concentration Range (µg/ft ²)
#1	Mechanical Room #1	A/C air handlers	3	302 - 828
#2	Mechanical Room #2	A/C air handlers	2	3.35 - 93.5
#1	Mechanical Room #3	A/C air handlers	2	83 – 1510
#1	Mechanical Room #4	A/C air handlers	2	133 – 3130
#3	Mechanical Room #5	A/C air handlers	3	8.3 - 4070
#3	Mechanical Room #6	A/C air handlers	2	57.4 – 929
#1	Machine Shops	Interior A/C ductwork	11	100 – 9110
#2	Machine Shops	Interior A/C ductwork	9	2.08 - 31.8
#3	Machine Shops	Interior A/C ductwork	4	4.32 - 16.8
#1 and #2	Office Areas	Walls	12	ND - 2.33
#1 and #2	Office Areas	Floors	6	19.5 – 952
#1 and #2	Office Areas	Ceiling materials	12	ND - 42.7
#1 and #2	Office Areas	Interior Ductwork	12	ND - 105
#2	Mechanical Room #2	Floors	3	56.2 - 139
#2	Mechanical Room #2	Walls	3	4.11 – 15.3
#2	Mechanical Room #2	Ceiling Materials	3	67.5 – 186
#2	Oil Storage / Transformer Room	Floors	3	877 – 1440
#2	Oil Storage / Transformer Room	Walls	3	19.2 - 358
#2	Oil Storage / Transformer Room	Ceiling Materials	3	2.57 - 12.4
#2	Loading Dock Office	Walls, floors, ceiling materials, HVAC ducts + vents	6	34.3 – 526
#1	Locker Room	Floors	3	18.4 - 581
#1	Locker Room	Walls	3	13.2 - 55.9
#1	Locker Room	Ceiling Materials	3	87.7 – 653
#1	Locker Room	HVAC ducts + vents	2	70.2 - 76.5
#3	Office Areas	Floors	3	6.34 - 115
#3	Office Areas	Walls	3	ND - 16.1
#3	Office Areas	Ceiling Materials	4	3.38 - 24.7
#3	Office Areas	HVAC ducts + vents	4	10.9 - 265
#3	Former Be Vacuum system, east side of building	Walls, floors, and ceiling materials	6	6.3 - 16000
#3	Oil / Coolant Storage Room	Floor	2	237 - 621
#3	Filter Press Shed /	Walls, floors, ceiling	6 .	57.8 - 1360
#4	Cleaning Area Process Rooms / Warehouse	materials	4	221 2100
		Floors Walls		321 -2100 ND 1970
#4 #4	Process Rooms / Warehouse		5 2	ND -1870
#4	Process Rooms / Warehouse Process Rooms / Warehouse	Ceiling materials HVAC ducts + vents	30	28.2 - 66.3
#5	Plating / Anodizing Rooms	Floors	4	8.54 – 9.92 6.50 – 263
#5	Plating / Anodizing Rooms	· Walls	4	1.83 - 54.7
#5	Plating / Anodizing Rooms	Ceiling materials	3	22.1 - 110
#5	Plating / Anodizing Rooms	HVAC ducts + vents	4	44.5 – 115
#5	Former Lancy Treatment System, and hazardous waste areas	Walls, floors, ceiling materials, plating ducts	9	8.87 – 213
#5	Former chemical storage area	Floor	2	59.2 – 466
<u></u>			L	1 Prim 100

As presented in Section 3, the prospective purchaser of the property recommended using $25 \,\mu g/ft^2$ as a site-specific surface cleaning standard for the ABC facility. For this reason, additional decontamination and abatement actions were conducted at the former ABC facility. The final decontamination and abatement activities are summarized in Sections 4 and 5.



Section 3

Evaluation of Published Regulatory Standards

3.1 SURFACE WIPE STANDARDS

No specific regulatory standards for beryllium in surface wipe samples have been published by federal, state or municipal regulatory agencies. The initial surface wipe limit of $46.5 \, \mu g/ft^2$ recommended by Lockheed Martin was based on the range of surface wipe limits recommended or adopted at various DOE facilities (Tetra Tech, 1996). However, the environmental engineering consultant for the prospective purchaser (Law Environmental, Inc.) recommended using a surface wipe cleaning standard of $25 \, \mu g/ft^2$ for the ABC facility. At Lockheed Martin's request, a beryllium limit of $25 \, \mu g/ft^2$ was established to identify areas for abatement.

No regulatory surface wipe criteria are available for chromium residues on building surfaces. Therefore, no cleanup standards were established for the ABC facility.

3.2 OSHA STANDARDS FOR WORKER PROTECTION

The Occupational Safety and Health Administration (OSHA) has published a permissible exposure limits (PEL) for beryllium as an airborne contaminant for worker protection. The OSHA mandated exposure limits are shown in Table 3-1.

Table 3-1
Exposure Limits for Beryllium

Compound	PEL 8-hour TWA	Ceiling Concentration	IDLH
Beryllium	0.002 mg/m ³	0.005 mg/m ³	4 mg/m³

Source: Federal OSHA 29 CFR. 1910. 1000, Air Contaminants

National Institute for Occupational Safety and Health (NIOSH)

Notes: PEL - Permissible Exposure Limit TWA - Time Weighted Average

IDLH - Immediately Dangerous to Life or Health

3.3 WASTE CLASSIFICATION AND DISPOSAL STANDARDS

A review of applicable federal regulations in 40 CFR Part 261 and the Florida Administrative Code (FAC) was conducted to determine the appropriate classification and disposal criteria for beryllium wastes generated during the decontamination and abatement program. Three types of wastes were generated: (1) bulk solid materials that contained beryllium residues (i.e., ceiling tiles, insulation, etc.); (2) bulk solid materials that contained chromium residues (i.e., Building 5 plating ductwork); and (3) wastewater from decontamination of building surfaces.

3.3.1 Beryllium Impacted Materials

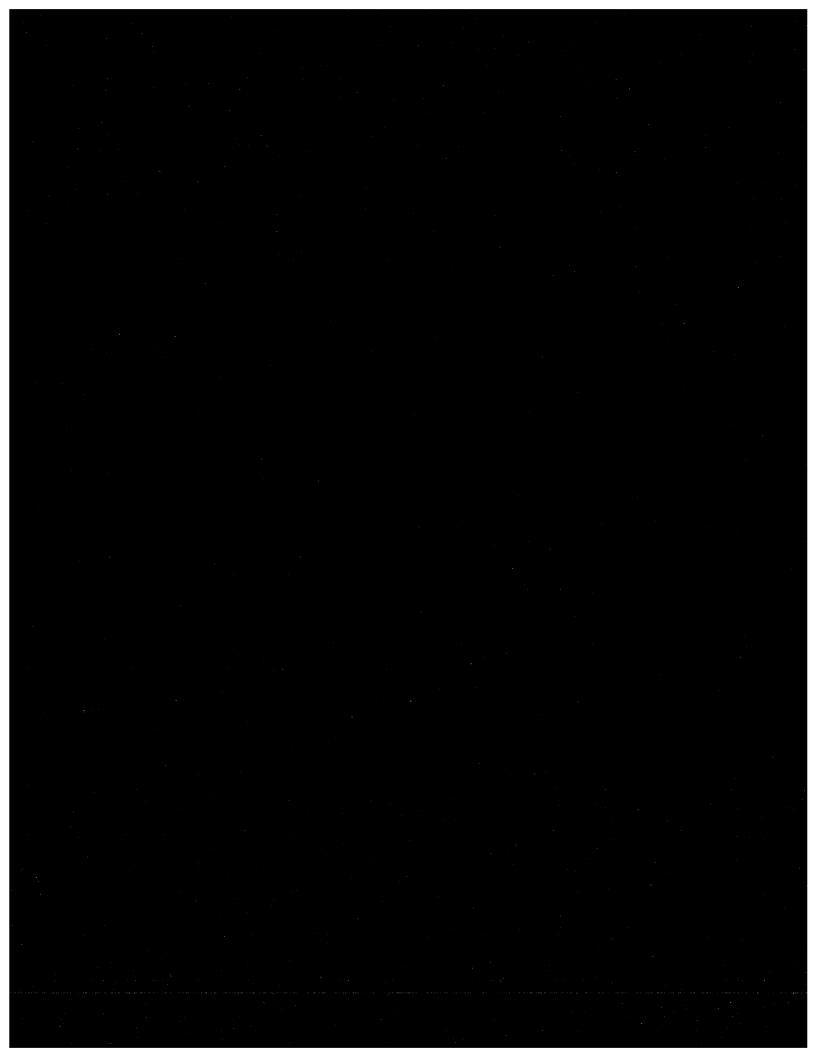
In accordance with CFR and FAC waste classification criteria, beryllium residues on bulk materials do not meet the definition of a characteristic or listed hazardous waste. Beryllium residues are not corrosive, reactive, ignitable, or toxic. In addition, since the waste was generated during machining operations and is not commercial chemical beryllium powder, a P015 listing in 40 CFR Part 261.33(e) is not applicable.

3.3.2 Chromium Impacted Materials

In accordance with CFR and FAC waste classification criteria, chromium residues on the bulk materials do not meet the definition of a characteristic or listed hazardous waste. The chromium residues were not derived from any waste processes listed in the federal or state hazardous waste regulations. Chromium residues do not meet the definition of corrosive, reactive, or ignitable wastes. To determine toxicity, samples were collected from the materials and analyzed using the Toxicity Characteristic Leaching Procedure (TCLP). The residues did not exceed the TCLP, indicating the materials are not hazardous by the toxicity characteristic - see Section 4.2.7.

3.3.3 Decontamination Wastewater

Wastewater generated from decontamination of the building materials are non-hazardous based on the classification criteria described in Sections 3.3.1 and 3.3.2.



Section 4

Beryllium Abatement Program

The following section describes the technical approach, scope of work and field methodology followed to complete the decontamination and abatement of beryllium impacted materials at the ABC facility. The abatement program was implemented from December 1999 through February 2000. Abatement activities were performed in accordance with Tetra Tech's <u>Decontamination</u> and Abatement of Beryllium Impacted Materials Work Plan, Former American Beryllium Company, dated November 30, 1999.

4.1 PROJECT APPROACH

In order to facilitate property transfer, a surface wipe limit of 25 μ g/ft² was selected as a guideline for abatement to reduce the potential for airborne beryllium hazards at the former ABC facility. As described in Section 2.2, beryllium concentrations were detected above 25 μ g/ft² in building materials throughout the facility. The abatement approach was to first remove beryllium-impacted materials that could not easily be decontaminated (ceiling materials, air handlers, HVAC ductwork, and carpets). Approximately 60 linear feet of ductwork associated with former plating and anodizing lines in Building 5 were also removed. Following removal of the materials, all accessible interior building surfaces (floors, walls, light fixtures, etc.) were subsequently decontaminated to below the beryllium cleanup level of 25 μ g/ft². A summary of the abatement activities performed at the ABC facility is described in Table 4-1.

Table 4-1
Beryllium Impacted Areas and Final Abatement Actions^a

Building Feature	Location	Abatement Action
Ceiling tiles, grid, fiberglass	Buildings 1, 2, 3 office areas, and Buildings 4 and 5	Removed
Other ceiling materials (light fixtures, etc.)	Buildings 1, 2, 3, 4, and 5	Decontaminated
HVAC ductwork .	Buildings 1, 2, 3, 4, and 5	Removed
Air handlers ^b	Buildings 1, 2, 3, 4, and 5	Removed
Beryllium vacuum piping	Building 4	Removed
Carpeting	Buildings 1, 2, and 3 (primarily office areas)	Removed
Walls, floors and other interior surfaces (includes floors below carpeted areas)	Buildings 1, 2, 3, 4, and 5	Decontaminated
Former Be vacuum system	Building 3, east side of building	Decontaminated
Filter press shed	Building 3	Decontaminated
Former Lancy Treatment System and hazardous waste / chemical storage area	Building 5	Decontaminated
Plating ductwork	Building 5	Removed
Sumps / Floor drains	Buildings 3 and 5	Decontaminated

a – Abatement activities focused on beryllium. However, decontamination activities in the Building #5 plating areas were also intended to remove chromium residues.

Following abatement activities, clearance sampling was performed to document that the beryllium abatement objectives had been attained. Both surface wipe and air clearance samples were collected and compared to site-specific clearance criteria.

b - Roof units were not removed.

4.2 FIELD METHODOLOGY

A description of each major task associated with the abatement program is presented in the following subsections:

4.2.1 Work Area Preparation and Isolation

Prior to disturbance of impacted materials, a work enclosure and decontamination facility was installed at each work area. The enclosure consisted of a single layer of polyethylene on all walls and floors designated for decontamination and abatement. A negative air chamber containing a HEPA filter system was installed within each work area to prevent particulate migration to areas outside the enclosure. This system remained in operation until final clearance samples were collected to document that no airborne beryllium hazards were present.

A decontamination facility was located at the egress point of the work area. All personnel and equipment within the work area were decontaminated prior to egress. A waste load out area was constructed for the decontamination and load out of beryllium waste packages prior to disposal.

4.2.2 Removal and Decontamination of Beryllium Impacted Materials

All beryllium impacted ceiling tiles (includes grid and insulation), vacuum piping, HVAC ductwork, air handlers, and carpets were removed from the former ABC facility. Ductwork from the Building 5 plating area was also removed. Prior to and during bulk removal, the materials were misted with an encapsulant to prevent airborne dust emissions. The materials were packaged (single bagged in six-millimeter thick polyethylene) and stored in a storage bin in preparation for disposal.

Following removal of bulk materials, the interior surface areas (walls, floors, ceiling materials, sumps and floor drains) were decontaminated using pressure wash and wipe down methods. All surface areas were decontaminated to the beryllium action level of 25 μ g/ft². Decontamination

water was collected and stored in a storage tank pending disposal. The tank was also used to store decontamination water generated from PPE cleaning.

4.2.3 Perimeter Air Monitoring during Abatement

During abatement and decontamination activities, perimeter air samples were collected to ensure and document that no fugitive beryllium emissions were released outside the containment area. The samples were collected using personal air sampling pumps that flowed at 3 liters per minute. Two perimeter air samples were collected during each work day; one sample was collected at the entrance to the work enclosure area; and one sample was collected at the HEPA filter exhaust. All perimeter air samples were analyzed for beryllium using either NIOSH Method 7300 or USEPA Method 6010A.

4.2.4 Clearance Wipe Sampling

Following decontamination of the building surfaces, clearance wipe samples were collected to ensure that the action level of $25 \,\mu\text{g/ft}^2$ had been attained. When a swipe sample exceeded the $25 \,\mu\text{g/ft}^2$ cleanup level, the surrounding area out to the nearest clean sampling point was recleaned. The area was then resampled to confirm that cleanup standards were attained.

Representative samples were collected from each area and material type that was decontaminated. Sample frequencies and locations in the major buildings (Buildings 1, 2, 3, 4, and 5) were determined using the following general methodology for each material type. For walls and floors, 8 samples were collected per 100 ft. x 100-ft. area (total 10,000-ft² area). For ceiling light fixtures, samples were collected at a rate of 8 per 100 fixtures (8% of the total fixtures counted at the facility). Samples were also collected from miscellaneous areas with different material types. Samples were collected throughout the buildings to provide adequate geographic coverage for each material type. Figures 4-1 through 4-12 present the surface wipe sampling locations. A summary of the clearance sampling counts for each building is provided below:

Building 1 clearance samples

- 1. Floor samples Building 1 contains approximately 18,000 ft² of floors in the former machining areas, and 4,500 ft² in the former office areas. Based on the estimated square footage, 14 clearance samples were collected from the former machining areas and 5 were collected from the former office areas see Figure 4-1.
- 2. Wall samples Building 1 contains approximately 13,685 ft² of walls in the former machining areas, and 16,500 ft² in the former office areas. Based on the estimated square footage, 14 clearance samples were collected from the former machining areas and 10 were collected from the former office areas see Figure 4-2.
- 3. Ceiling light fixture samples Building 1 contains approximately 268 light fixtures. Based on the estimated light fixture count, 18 clearance samples were collected from Building 1 (9 from the former machining areas and 9 from the former office areas) see Figure 4-3.
- 4. <u>Samples from miscellaneous areas</u> Additional rooms and areas sampled in Building 1 include Mechanical Room #1, Mechanical Room #3, Mechanical Room #4, the locker room, and the oil storage area. Three samples (1 floor, 1 wall, and 1 light fixture) were collected from each of these rooms see Figures 4-1 through 4-3.

Building 2 clearance samples

- Floor samples Building 2 contains approximately 11,000 ft² of floors in the former machining areas, and 5,250 ft² in the former office and engineering areas. Based on the estimated square footage, 9 clearance samples were collected from the former machining areas and 5 were collected from the former office and engineering areas see Figure 4-4.
- 2. Wall samples Building 2 contains approximately 19,950 ft² of walls in the former machining areas, and 8,200 ft² in the former office and engineering areas. Based on the

- estimated square footage, 17 clearance samples were collected from the former machining areas and 7 were collected from the former office and engineering areas see Figure 4-5.
- 3. Ceiling light fixture samples Building 2 contains approximately 158 light fixtures in the former machining areas, and 107 light fixtures in the former office and engineering areas. Based on the estimated light fixture count, 12 clearance samples were collected from the former machining areas and 9 were collected from the former office and engineering areas see Figure 4-6.
- 4. <u>Samples from miscellaneous areas</u> Additional rooms and areas sampled in Building 2 include Mechanical Room #2 and the former loading dock office. Three samples (1 floor, 1 wall, and 1 light fixture) were collected from each of these rooms see Figures 4-4 through 4-6.

Building 3 clearance samples

- Floor samples Building 3 contains approximately 6,000 ft² of floors in the former machining and office areas. Based on the estimated square footage, 5 clearance samples were collected from the machining and office areas. A wipe sample was also collected from a floor drain and a sump in the building see Figure 4-7.
- Wall samples Building 3 contains approximately 9,645 ft² of walls in the former machining and office areas. Based on the estimated square footage, 8 clearance samples were collected from the machining and office areas see Figure 4-8.
- 3. Ceiling light fixture samples Building 3 contains approximately 89 light fixtures in the former machining and office areas. Based on the estimated light fixture count, 8 clearance samples were collected from the former machining and office areas see Figure 4-9.
- 4. <u>Samples from miscellaneous areas</u> Additional rooms and areas sampled in Building 3 include Mechanical Room #5 (also referred to as oil/coolant storage room), a former

filter press shed, and a former beryllium vacuum system shed. Three samples (1 floor, 1 wall, and 1 light fixture) were collected from each of these rooms - see Figures 4-7 through 4-9.

Buildings 4 and 5 clearance samples

- Floor samples Buildings 4 and 5 contains approximately 8,085 ft² of floors in the former laboratory and process areas. Based on the estimated square footage, 7 clearance samples were collected from the former laboratory and process areas. A wipe sample was also collected from a floor drain in Building 5 see Figure 4-10.
- 2. <u>Wall samples</u> Buildings 4 and 5 contain approximately 8,305 ft² of walls in the former laboratory and process areas. Based on the estimated square footage, 7 clearance samples were collected from the machining and office areas see Figure 4-11.
- 3. Ceiling light fixture samples Buildings 4 and 5 contain approximately 100 light fixtures in the former laboratory and process areas. Based on the estimated light fixture count, 8 clearance samples were collected from the former laboratory and process areas see Figure 4-12.
- 4. <u>Samples from miscellaneous areas</u> Additional rooms and areas sampled in Buildings 4 and 5 include the former treatment system and chemical storage area located east of the building. Three samples (1 floor, 1 wall, and 1 light fixture) were collected from this area see Figures 4-10 through 4-12.

The clearance swipe samples were collected using laboratory supplied wipe media templates. A 12-inch by 12-inch area was first outlined on the sampled surface. The samples were then collected by applying an "S" shaped motion once with its entire surface and then again in the opposite direction with a half-folded surface. Each wipe sample was then folded once more and placed in separate vial containers. Disposable surgical gloves were used to prevent cross

contamination of the samples. The samples were analyzed for beryllium using EPA Method 6010A. The chromium samples were analyzed using EPA Method 6010A.

4.2.5 Clearance Air Sampling

Clearance air samples were collected from each building to ensure that no airborne beryllium hazards exist following decontamination. The samples were collected using personal air sampling pumps that flowed at approximately 3 liters per minute. The samples were collected at positions ranging from 4 to 6 feet above ground surface to simulate the breathing zone of future facility occupants. The following number of clearance samples were collected from each building:

Table 4-2
Summary of Air Clearance Samples

Building Number	Number of Air Samples
1	6
2	6
3	2
4	. 2
5	2

Sampling pumps were calibrated before and after the sampling events. The air samples were analyzed for beryllium using NIOSH Method 7300 or USEPA Method 6010A. Air clearance sample locations are shown on Figures 4-13 through 4-16.

4.2.6 Disposal of Beryllium Impacted Materials

The beryllium impacted bulk materials and wastewater were disposed of in accordance with applicable CFR and FAC waste classification criteria. As outlined in Section 3.3, the beryllium residues on the bulk materials do not meet the definition of a characteristic or listed hazardous waste and were therefore not disposed of as a hazardous waste. The bulk materials were transported to the Manatee County landfill.

As outlined in Section 3.3, the decontamination water was also determined to be non-hazardous. The decontamination water was therefore transported as a non-hazardous waste to Clark Environmental's permitted treatment and recycling facility located in Mulberry, Florida.

4.2.7 Removal and Disposal of Chromium Impacted Plating Ductwork

Approximately 60 linear feet of ductwork associated with former plating and anodizing lines in Building 5 and the former treatment storage area were removed. Prior to disposal, the ductwork was cut into sections and then decontaminated to remove visible residues and stains. To determine if the materials were a hazardous waste, a bulk sample was collected from the ductwork and analyzed for chromium using the TCLP method. The sample reported a concentration of 2.5 mg/L of chromium, which is below the chromium toxicity criterion of 5 mg/L. The bulk materials were subsequently transported as a non-hazardous waste to the Manatee County landfill.

Following removal of the ductwork from Building 5 and the former treatment storage area, the interior surfaces (walls, floors, ceilings) were decontaminated in accordance with the methods prescribed in Section 4.2.2. Surface wipe samples were collected from the building surfaces to document post-decontamination chromium concentrations. No wipe sample criteria were identified for chromium.

4.3 SUMMARY OF ANALYTICAL DATA

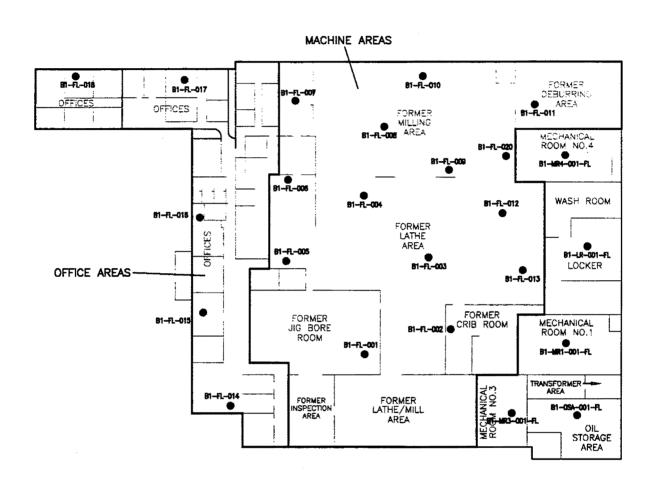
4.3.1 Surface Wipe Sampling Data

Surface wipe samples were collected during and after abatement to document that the site-specific beryllium cleanup standard of $25\mu g/ft^2$ was attained. All final clearance samples show that the surface cleaning standards have been attained. Copies of the laboratory data reports are presented in Appendix A. A summary of the final beryllium clearance data is presented in Table 4-3 on pages 4-27 to 4-29. A summary of the chromium surface wipe data is presented in Table 4-4 on page 4-30.

4.3.2 Air Clearance Sampling Data

Air clearance samples were collected after abatement to document that airborne beryllium concentrations within the buildings did not exceed OSHA's 0.002 mg/m³ PEL. All air clearance samples did not report concentrations above the detection limit of 0.00005 mg/m³. Copies of the laboratory data reports are presented in Appendix A. A summary of the final clearance data is presented in Table 4-4 on page 4-29.

FIGURE 4-1 BUILDING 1 FLOORS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B1-FL-001 SWIPE SAMPLES

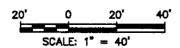
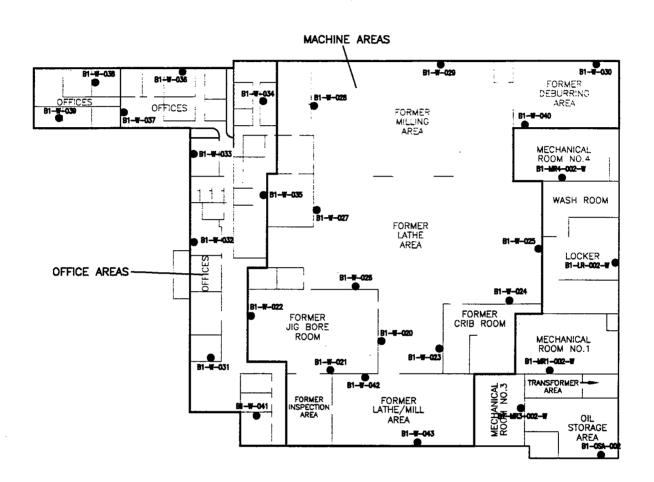


FIGURE 4-2 BUILDING 1 WALLS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B1-W-021 SWIPE SAMPLES

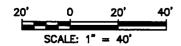
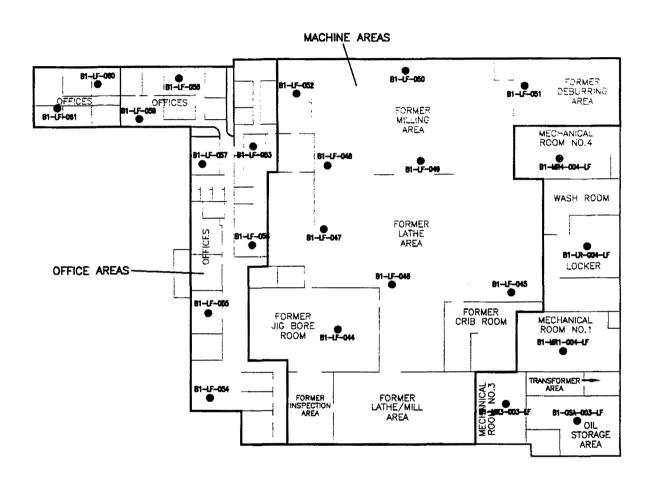




FIGURE 4-3 BUILDING 1 LIGHT FIXTURES CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B1-LF-044 SWIPE SAMPLES

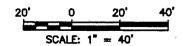
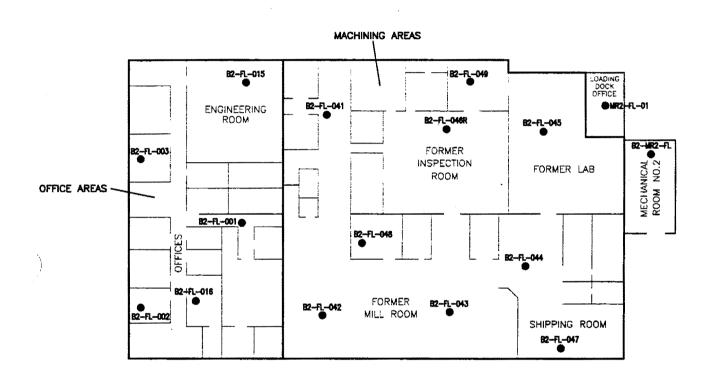




FIGURE 4-4 BUILDING 2 FLOORS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B2-FL-042 SWIPE SAMPLES

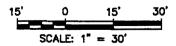
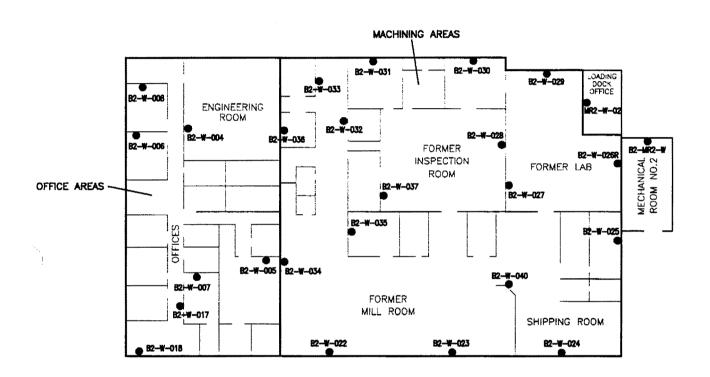


FIGURE 4-5 BUILDING 1 WALLS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B2-W-022 SWIPE SAMPLES

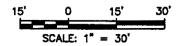
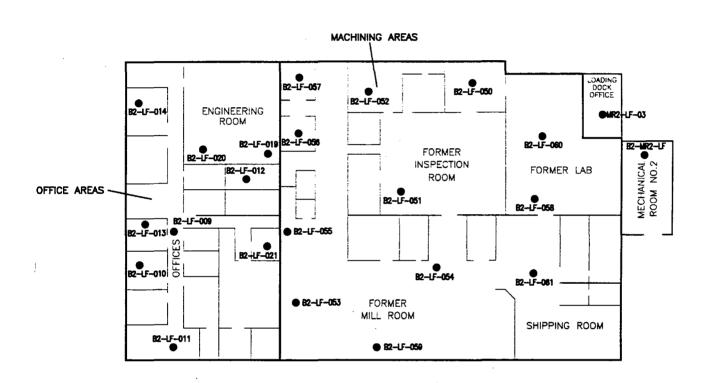


FIGURE 4-6 BUILDING 2 LIGHT FIXTURES CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B2-LF-051 SWIPE SAMPLES

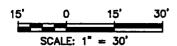
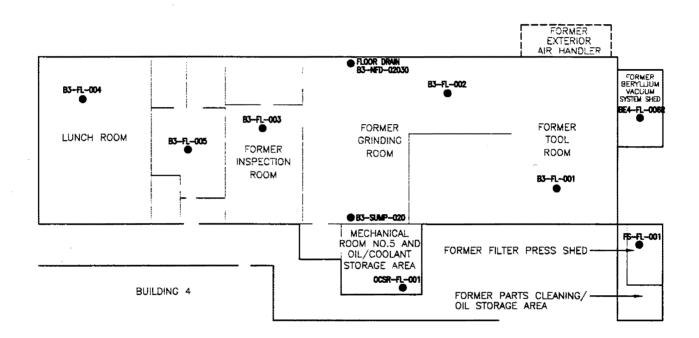




FIGURE 4-7 BUILDING 3 FLOORS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B3-FL-001 SWIPE SAMPLES

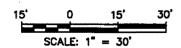
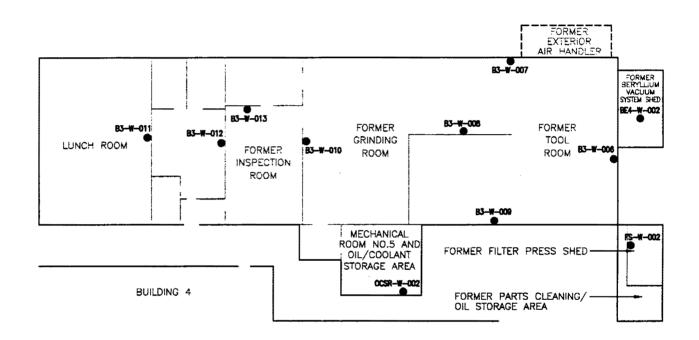


FIGURE 4-8 BUILDING 3 WALLS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

■ B3-W-006 SWIPE SAMPLES

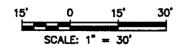
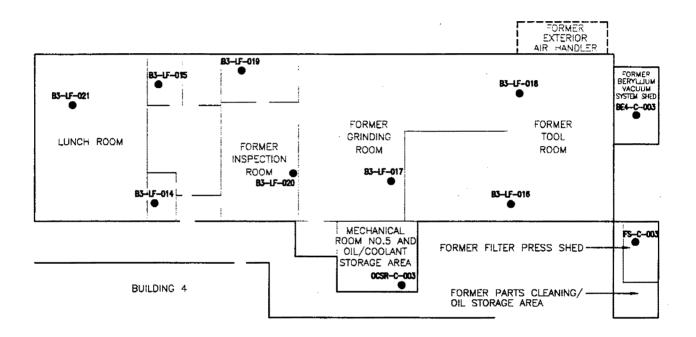




FIGURE 4-9 BUILDING 3 LIGHT FIXTURES CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B3-LF-014 SWIPE SAMPLES

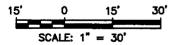
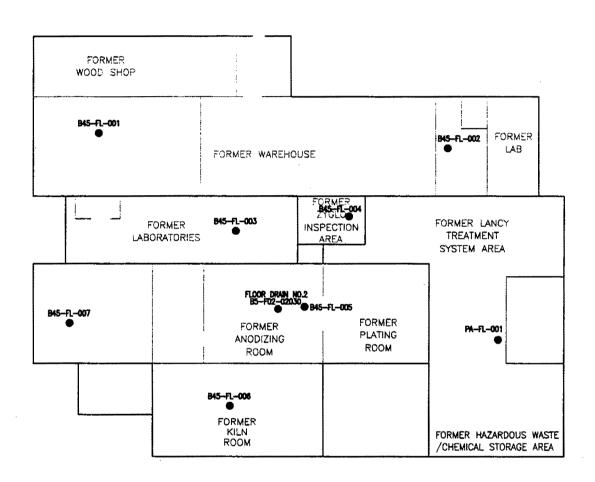




FIGURE 4-10 BUILDING 4 & 5 FLOORS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B45-FL-001 SWIPE SAMPLES

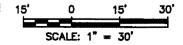
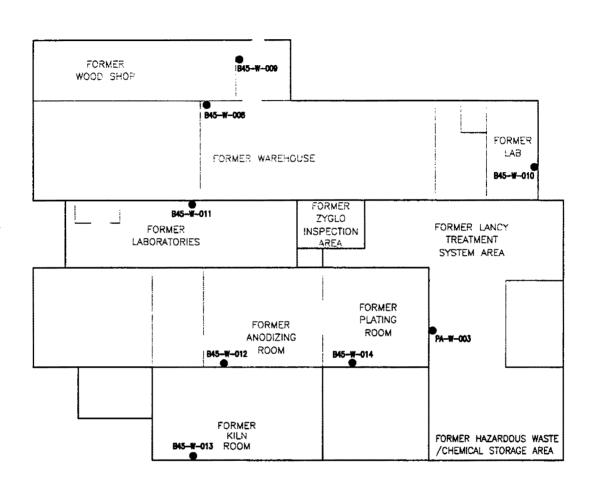




FIGURE 4-11 BUILDING 4 & 5 WALLS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B45-W-008 SWIPE SAMPLES

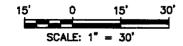
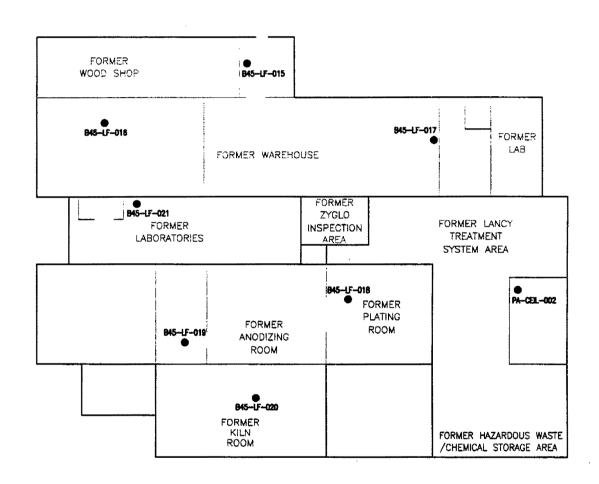




FIGURE 4-12 BUILDING 4 & 5 LIGHT FIXTURES CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B45-LF-015 SWIPE SAMPLES

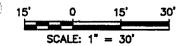
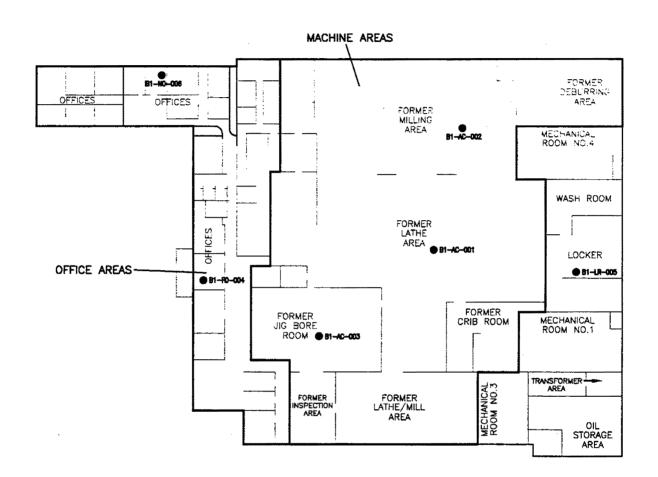


FIGURE 4-13 BUILDING 1 AIR CLEARANCE SAMPLE LOCATIONS



LEGEND

● B1-NO-006 AIR CLEARANCE SAMPLES

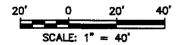
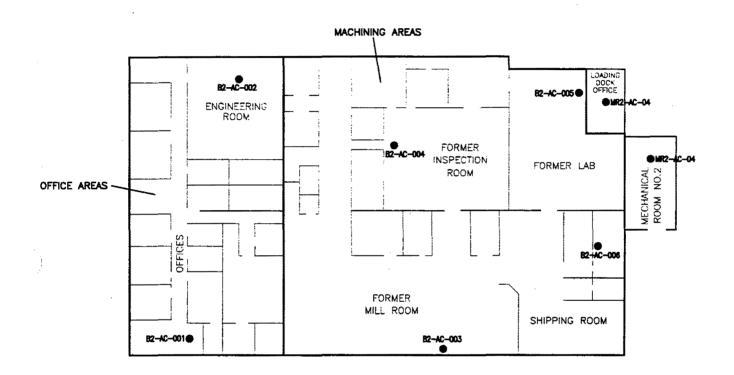


FIGURE 4-14 BUILDING 2 AIR CLEARANCE SAMPLE LOCATIONS



LEGEND

● B2-AC-001 AIR CLEARANCE SAMPLES

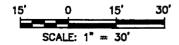
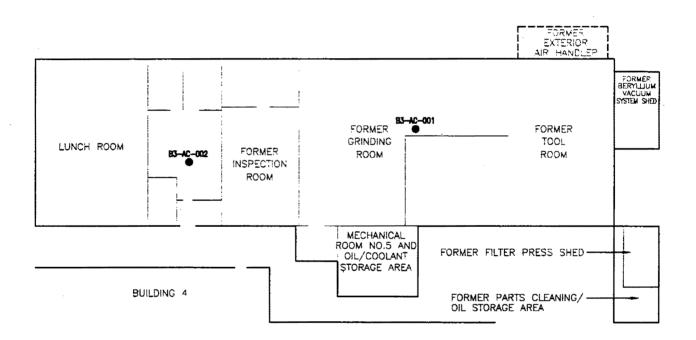


FIGURE 4-15 BUILDING 3 AIR CLEARANCE SAMPLE LOCATIONS



LEGEND

● B3-AC-001 AIR CLEARANCE SAMPLES

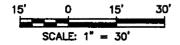
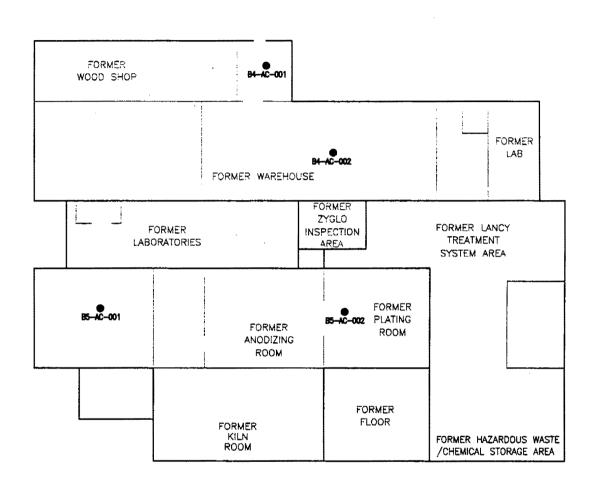




FIGURE 4-16 BUILDING 4 & 5 AIR CLEARANCE SAMPLE LOCATIONS



LEGEND

● B4-AC-001 AIR CLEARANCE SAMPLES

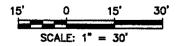


Table 4-3
Summary of Beryllium Abatement Actions and Final Surface Swipe Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Building Feature	Location	Abatement Action	No. of Samples	Beryllium Surface Wipe Concentration Range (μg/ft²)
Ceiling Tiles, grid, and fiberglass	Buildings #1 and #2	Removal	Not Applicable	Not Applicable
HVAC ductwork Air handlers	Buildings #1 and #2 Buildings #1 and #2	Removal Removal	Not Applicable Not Applicable	Not Applicable Not Applicable
Former beryllium vacuum system shed and beryllium vacuum piping	Building #3 (tub from shed) Building 4 (vacuum piping)	Removal	Not Applicable	Not Applicable
Carpeting Floors	Buildings #1 and #2 Building #1	Removal Decontamination	Not Applicable Building #1	Not Applicable Building #1
	 Machining areas Office areas Mechanical room 1 Mechanical room 3 Mechanical room 4 Locker room Oil storage area 	·	- 14 samples - 5 samples - 1 samples	- 0.14 - 5.3 - 0.5 - 3.6 - 21.24 - 5.35 - 17.64 - 18.76 - 0.19
	Building #2 - Machining areas - Office areas - Mechanical room 2 - Loading dock office	Decontamination	Building #2 - 9 samples - 5 samples - 1 samples - 1 samples	Building #2 - 0.34 - 13.28 - ND - 5.13 - 0.38 - 1.85
	Building #3 - Shops / offices - Be vacuum system - Filter press shed - Mechanical room 5 - Floor drain - Sump	Decontamination	Building #3 - 5 samples - 1 sample	Building #3 - 0.09 - 4.5 - 0.06 - ND - 1.24 - 1.18 - 1.03
	Buildings #4 and #5 - Process rooms / labs - Exterior storage area - Floor drain #2	Decontamination	Buildings #4 and #5 - 7 samples - 1 sample - 1 sample	Buildings #4 and #5 - 0.85 - 6 - ND - 1.03

Table 4-3 (continued)
Summary of Beryllium Abatement Actions and Final Surface Swipe Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Building Feature	Location	Abatement Action	No. of Samples	Beryllium Surface Wipe Concentration Range (μg/ft²)	
Walls	Building #1	Decontamination	Building #1	Building #1	
	 Machining areas Office areas Mechanical room 1 Mechanical room 3 Mechanical room 4 Locker room Oil storage area 		- 14 samples - 9 samples - 1 samples	- ND - 16.08 - 0.05 - 3.1 - 4.35 - 4.39 - 1.36 - 1.4 - 0.20	
	Building #2	Decontamination	Building #2	Building #2	
	 Machining areas Office areas Mechanical room 2 Loading dock office 		- 9 samples - 5 samples - 1 samples - 1 samples	- ND - 0.86 - 0.07 - 0.53 - 0.57 - 0.42	
	Building #3	Decontamination Building #3		Building #3	
	- Shops / offices - Be vacuum system - Filter press shed - Mechanical room 5	7	- 8 samples - 1 sample - 1 sample - 1 sample	- ND - 1.76 - 4.7 - ND - 5.25	
	Buildings #4 and #5	Decontamination	Buildings #4 and #5	Buildings #4 and #5	
	- Process rooms / labs - Exterior storage area		- 7 samples - 1 sample	- 0.09 - 4.38 - 0.23	
Light fixtures and other ceiling	Building #1	Decontamination	Building #1	Building #1	
other ceiling materials	 Machining areas Office areas Mechanical room 1 Mechanical room 3 Mechanical room 4 Locker room Oil storage area 		- 14 samples - 9 samples - 1 samples	- 0.05 - 8.0 - 0.05 - 3.35 - 13.08 - 5.92 - 13.72 - 6.2 - 0.10	

Table 4-3 (continued)
Summary of Beryllium Abatement Actions and Final Surface Swipe Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Building Feature	Location	Abatement Action	No. of Samples	Beryllium Surface Wipe Concentration Range (μg/ft²)
Light fixtures and other ceiling materials	Building #2 - Machining areas - Office areas - Mechanical room 2 - Loading dock office	Decontamination	Building #2 - 9 samples - 5 samples - 1 samples - 1 samples	Building #2 - ND - 0.86 - 0.07 - 0.53 - 0.57 - 0.42
Light fixtures and other ceiling materials (Continued)	Building #3 - Shops / offices - Be vacuum system - Filter press shed - Mechanical room 5	Decontamination	Building #3 - 8 samples - 1 sample - 1 sample - 1 sample	Building #3 - 0.23 - 9.0 - 1.44 - 0.19 - 0.12
	Buildings #4 and #5 - Process rooms / labs - Exterior storage area	Decontamination	Buildings #4 and #5 - 8 samples - 1 sample	Buildings #4 and #5 - 0.81 - 6.6 - 1.71

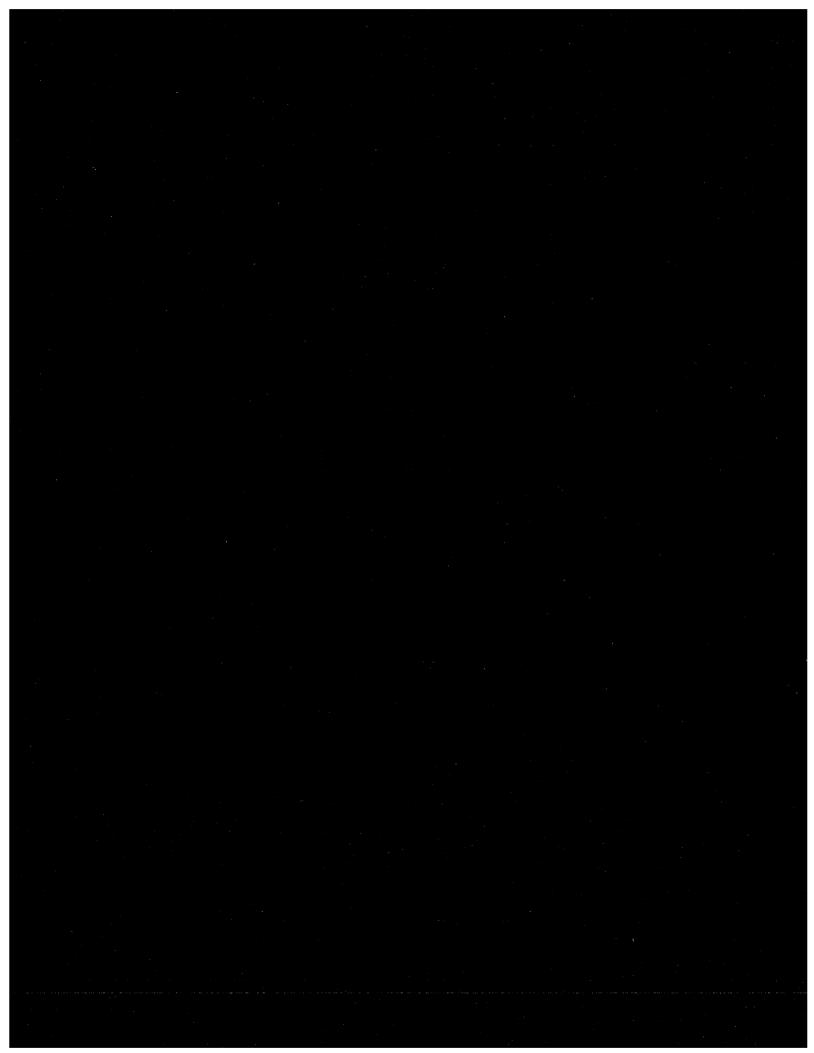
ND - Not Detected.

Table 4-4
Summary of Beryllium Air Clearance Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Sample Type	Location	No. of Samples	Beryllium Air Concentration Range (mg/m³)
Air Filter Media	Building #1	6	All samples reported < 0.00005
Air Filter Media	Building #2	6	All samples reported < 0.00005
Air Filter Media	Building #3	2	All samples reported < 0.00005
Air Filter Media	Buildings #4 and #5	4	All samples reported < 0.00005

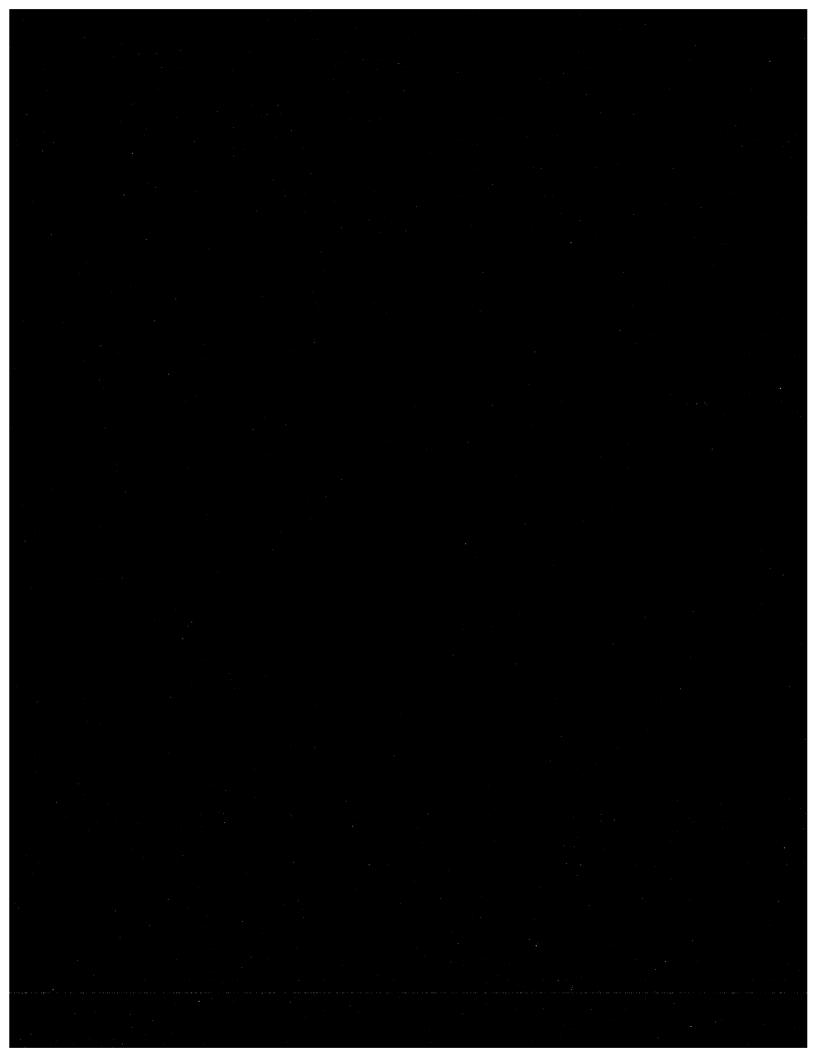
Table 4-5
Summary of Plating Ductwork Abatement Actions and Chromium Swipe Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Building Feature	Abatem Location Action		No. of Samples	Chromium Surface Wipe Concentration Range (µg/ft²)		
Plating ductwork	Building #5	Decontamination and Removal	Not Applicable	Not Applicable		
Floors	Building #5 - Process rooms / labs - Exterior storage area	Decontamination	Building #5 - 5 samples - 1 sample	Building #5 - 3.32 - 64.15 - ND		
Walls	Building #5 - Process rooms / labs - Exterior storage area	Decontamination	Building #5 - 4 samples - 1 sample	Building #5 - 0.16 - 3.27 - 0.3		
Light fixtures and other ceiling materials	Building #5 - Process rooms / labs - Exterior storage area	Decontamination	Building #5 - 5 samples - 1 sample	Building #5 - 1.41 - 33.83 - 13.33		



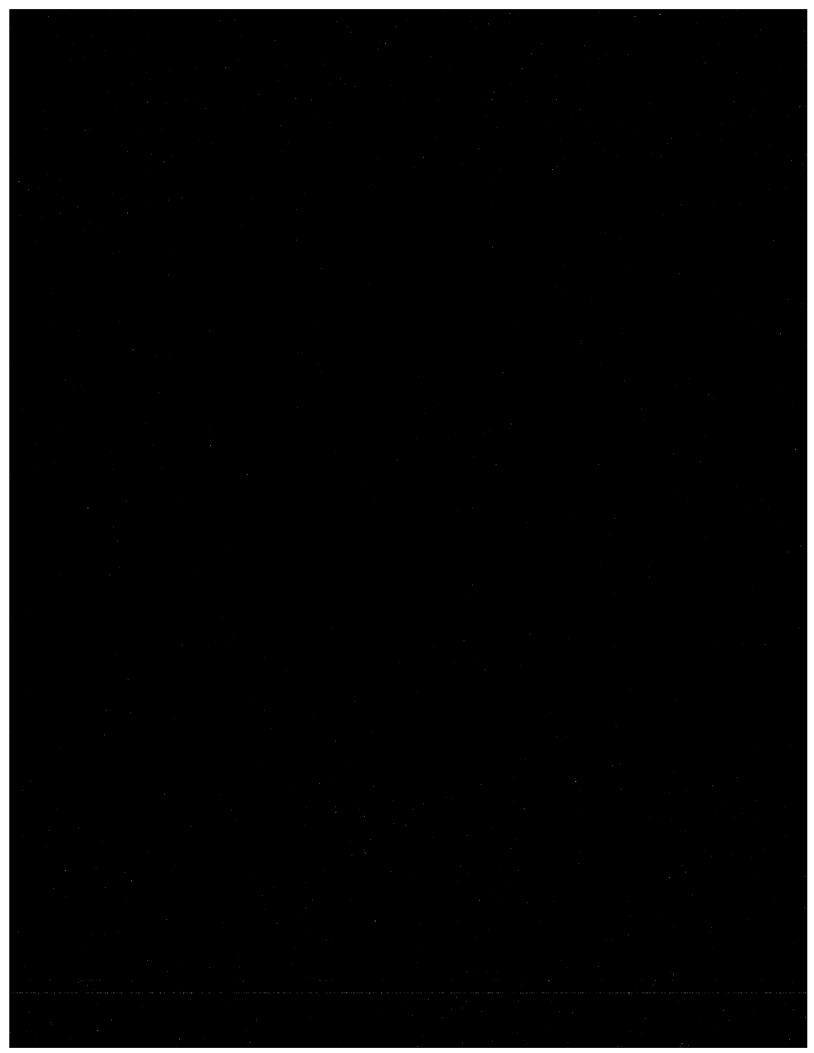
Section 5 Conclusions

Beryllium-impacted ceiling materials (tiles, grid, insulation), HVAC ductwork, air handlers, carpets, and Building 5 plating ductwork were removed and disposed of in accordance with appropriate federal and state disposal criteria. Clearance swipe samples collected after final decontamination and abatement activities were all less than the surface swipe criteria of 25 µg/ft². Air clearance samples reported that airborne beryllium concentrations were below OSHA's 0.002 mg/m³ PEL. Based on the results of the abatement program, all beryllium abatement objectives were achieved. With concurrence from Law Environmental, Inc., no further action is required, and all buildings are considered suitable for occupancy.



Section 6 References

- 1. Department of Energy, Chronic Beryllium Disease Prevention Program; Proposed Rule, Federal Register, December 3, 1998.
- 2. Tetra Tech, Inc Recommendations for Surface Wipe Concentration Limits for Beryllium American Beryllium Facility, December 19, 1996.
- 3. Tetra Tech, Inc., Air and Wipe Sampling at Lockheed Martin's Former American Beryllium Company, January 1997.
- 4. Tetra Tech Inc., Final Phase 1 Environmental Assessment, Former American Beryllium Company, 1600 Tallevast Road, Tallevast, Florida, February 7, 1997.
- 5. Tetra Tech, Inc., Facility Assessment Former American Beryllium Company, July 28, 1997.
- 6. Tetra Tech Inc., Work Plan, Decontamination and Abatement of Beryllium Impacted Materials, Former American Beryllium Company, 1600 Tallevast Road, Tallevast, Florida, November 30, 1999.
- 7. Tetra Tech Inc., Final Work Plan, Decontamination and Abatement of Beryllium Impacted Materials, Former American Beryllium Company, 1600 Tallevast Road, Tallevast, Florida, August 19, 1999.
- 8. U.S. Environmental Protection Agency, Code of Federal Regulations, Protection of Environment, 40 CFR Part 261, July 1997







Certificate of Analysis

REPORTED DATE: February 08, 2000

Page: 1 of 1 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: LOCKHEED BERYLLIUM ABATEMENT-FILTERS

RECEIVED DATE: 03-JAN-00

PO#:

Air Filter Analysis

PBS&J Login Number: 0001-133

PBSJ Sample No.	Client Sample ID Locator		Collection	date/time
0001-133-01	B1/PER01/122999		12/29/99	16:10:00
0001-133-02	B1/PER02/122999		12/29/99	16:20:00
0001-133-03	B1/PER01/123099		12/30/99	15:30:00
0001-133-04	B1/PER01/123099		12/30/99	15:35:00

Thank you for using PBS&J Analytical Services

T. French

PBS&J Project Manager

RESULTS BY SAMPLE

Reported: February 08, 2000 02:13 PM

Page 1 of 1 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

> 600 University Street, Suite 800 Seattle, WA 98101

(206)587-4648 FAX 624-3679

PBS&J Project Manager: T. French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0001-133-1	Client ID B1/PER01/12	2999	Date Received 01/03/00	Site			Date & 12/29/9	Time Collected 9 16:10:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Air b	oy ICAP			NIOSH 7	7300		01/13/00	01/13/00 DM
beryllium		.00005	U mg/filter			.00005	i	
PBS&J Sample No. 0001-133-2	Client ID B1/PER02/12	2999	Date Received 01/03/00	Site			Date & 12/29/9	Time Collected 9 16:20:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Air b	oy ICAP			NIOSH 7	7300		01/13/00	01/13/00 DM
beryllium		.00005	U mg/filter			.00005		
PBS&J Sample No. 0001-133-3	Client ID B1/PER01/12	3099	Date Received 01/03/00	Site		•	Date & 12/30/9	Time Collected 9 15:30:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Air b	oy ICAP			NIOSH 7	7300		01/13/00	01/13/00 DM
beryllium		.00005	U mg/filter			.00005		
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Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Air b	y ICAP			NIOSH 7	7300		01/13/00	01/13/00 DM
beryllium		.00005	U mg/filter			.00005		

TETRA TECH, INC. 15400 NE 90th, Suite 100 Redmond, Washington 98052 (206) 883-1912 FAX (206) 881-6997

CHAIN OF CUSTODY

DOCUMENT	
DOCUMENT	

PROJECT NAME OCKheed Beryllium Abatement SAMPLERS: (signature) PROJECT NO. NUMBER OF CONTAINERS **MEDIA** SAMPLE ID TIME DATE Sediment Ground Water Soil REMARKS B1/Per \$1/122999 1610 122999 -3 B1/Per \$2/122999 1620 122999 -3 B1/Per \$1/123099 1530 123099 -4 B1/Per \$1/123099 1535 123099 RELINQUISHED BY (signature) DATE/TIME RECEIVED FOR LAB BY (Signature) DATE/TIME TOTAL NUMBER OF CONTAINERS 12 3,99 REPEIVED BY (signature) DATEITIME RELINQUISHED BY (signature) DATE/TIME CONDITION OF CONTENTS TEMPERATURE UPON RECEIPT N. Joganand 09:45 01 02 2000 Fed EX 815017581224 Dilastaco 9 RELINQUISHED BY (signature) DATE/TIME DATE/TIME RECEIVED BY (signature) REMARKS RECEIVED BY (signature) DATE/TIME METHOD OF SHIPMENT AIRBILL NO.

Distribution: C

ા - Lab Copy Yellow copy - Final Tetra Tech Copy Pink Copy - Field File Copy

•



Certificate of Analysis

REPORTED DATE: February 08, 2000

Page: 1 of 1 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: LOCKHEED BERYLLIUM ABATEMENT-FILTERS

RECEIVED DATE: 17-JAN-00

PO#:

Air Filter Analysis

PBS&J Login Number: 0001-543

PBSJ Sample No.	Client Sample ID Locator		Collection	date/time
0001-543-01	ENT-PER-011100		01/11/00	16:30:00
1001-543-02	EXT-PER-011100		01/11/00	16:35:00
0001-543-03	ENT-PER-011200		01/12/00	16:45:00
0001-543-04	EXT-PER-011200		01/12/00	16:44:00
0001-543-05	ENT-PER-011300		01/13/00	16:05:00
0001-543-06	EXT-PER-011300		01/13/00	16:00:00

Thank you for using PBS&J Analytical Services

T. French

PBS&J Project Manager

RESULTS BY SAMPLE

Reported: February 08, 2000 02:03 PM

Page 1 of 2 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

> 600 University Street, Suite 800 Seattle, WA 98101 (206)587-4648 FAX 624-3679

PBS&J Project Manager: T. French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

following res	uits:								
PBS&J Sample No. 0001-543-1	Client ID ENT-PER-01	1100		ate Received /17/00	Site	!		Date & 01/11/0	Time Collected
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Anal
Metals in Air h	oy ICAP				NIOSH	7300		01/17/00	01/17/00 Dt
beryllium	•	.00005	U	mg/m3			.0000	5	
PBS&J Sample No. 0001-543-2	Client ID EXT-PER-01	1100		ate Received /17/00	Site			Date & 01/11/0	Time Collected 00 16:35:00
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Anal
Metals in Air b	oy ICAP				NIOSH	7300		01/17/00	01/17/00 DN
beryllium		.00005	U	mg/m3			.0000	5	
PBS&J Sample No. 0001-543-3	Client ID ENT-PER-01	1200		ate Received /17/00	Site			Date & Time Collected 01/12/00 16:45:00	
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Anal
Metals in Air b	y ICAP				NIOSH	7300		01/17/00	01/17/00 DN
beryllium .		.00005	U	mg/m3			.0000	5	
PBS&J Sample No. 0001-543-4	Client ID EXT-PER-01	1200	-	ate Received /17/00	Site			Date & Time Collected 01/12/00 16:44:00	
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Anal
Metals in Air k	y ICAP	•		х*	NIOSH	7300		01/17/00	01/17/00 DN
beryllium		.00005	Ū	mg/m3			.0000	5	
PBS&J Sample No. 0001-543-5	Client ID ENT-PER-01	1300		ate Received /17/00	Site			Date & 01/13/0	Time Collected 00 16:05:00
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Anal
Metals in Air b	y ICAP				NIOSH	7300		01/17/00	01/17/00 Di
beryllium		.00005	U	mg/m3			.0000	5	

RESULTS BY SAMPLE

Reported: February 08, 2000 02:03 PM

Page 2 of 2 Pages

PBS&J Sample No. 0001-543-6

Client ID

Date Received

Site

Date & Time Collected

EXT-PER-011300 01/17/00

01/13/00 16:00:00

Parameter	Results Qual Units	Method Mi	DL Prepdate	Analyzed Analyst
Metals in Air by ICAP		NIOSH 7300	01/17/00	01/17/00 DM
bervllium	.00005 U mg/m3	. 0	0005	

RA TECH, INC. 19400 NE 90th, Suite 100 Redmond, Washington 98052 (206) 883-1912 FAX (206) 881-6997

CHAIN OF CUSTODY

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Certificate of Analysis

REPORTED DATE: February 08, 2000

Page: 1 of 1 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: LOCKHEED BERYLLIUM ABATEMENT-FILTERS

RECEIVED DATE: 31-JAN-00

PO#:

Air Filter Analysis

PBS&J Login Number: 0001-750

PBSJ Sample No.	Client Sample ID	Locator	Collection	Collection date/time				
0001-750-01	ENT-PER-012600		01/26/00	17:00:00				
<u>^001-750-02</u>	EXT-PER-012600		01/26/00	17:05:00				
0001-750-03	ENT-PER-012700		01/26/00	16:00:00				
0001-750-04	EXT-PER-012700		01/26/00	16:05:00				

Thank you for using PBS&J Analytical Services

T. French

PBS&J Project Manager

RESULTS BY SAMPLE

Reported: February 08, 2000 02:08 PM

Page 1 of 1 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

beryllium

600 University Street, Suite 800 Seattle, WA 98101

(206)587-4648 FAX 624-3679

PBS&J Project Manager: T. French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0001-750-1	Client ID ENT-PER-01	2600	Date Received	d Site			Date & Time Collected 01/26/00 17:00:00				
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst			
Metals in Air k	y ICAP			NIOSH	7300		01/31/00	01/31/00 DM			
beryllium		.00005	U mg/filte	:		.0000	5				
PBS&J Sample No. 0001-750-2	Client ID EXT-PER-01	2600	Date Received	d Site			Date & 01/26/0	Time Collected			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst			
Metals in Air h	by ICAP			NIOSH	7300		01/31/00	01/31/00 DM			
beryllium		.00005	U mg/filte	-		.0000	5				
PBS&J Sample No. 0001-750-3	<u> </u>		Date Received	d Site			Date & 01/26/0	Time Collected 00 16:00:00			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst			
Metals in Air b	y ICAP			NIOSH	7300		01/31/00	01/31/00 DM			
beryllium		.00005	mg/filter	•		.0000	5				
PBS&J Sample No. 0001-750-4	Client ID EXT-PER-01:	2700	Date Received 01/31/00	d Site			Date & 01/26/0	Time Collected 00 16:05:00			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst			
Metals in Air b	y ICAP			NIOSH	7300		01/31/00	01/31/00 DM			

.00005

.00005 U mg/filter

TETRA TECH, INC. 15400 NE 90th, Suite 100 Redmond, Washington 98052 (206) 883-1912 FAX (206) 881-6997

CHAIN OF CUSTODY

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February 11, 2000

15:01

CERTIFICATE OF ANALYSIS

WORKORDER:

SAMPLE SUMMARY

0002001

SENT TO:

TETRA TECH, INC. 600 UNIVERSITY STREET

SUITE 800

SEATTLE, WA 98101

PHIL SKÓRGE

206-587-4648 FAX 624-3679

ANALYZED

WORK DESCRIPTION: ABC FACILITY

PBS&J Analytical Services

BY:

6635 East Colonial Drive

Orlando, Florida 32807

Phone: (407) 277-4443

Fax: (407)382-8794

PROJECT: PBS&J CONTACT:

FRENCH

01/06/00

TAKEN BY: TRANSPORTED: SAMPLE TYPES:

PO#:

RECEIVED DATE: REPORTED DATE:

02/11/00

State of Florida Certifications: E83011-Environmental, 83170-Drinking Water and Radiochemistry

CompQAP 860044G. State of North Carolina Certification: 547

SAMPLE DESCRIPTION	LAB ID	COLLECTED DATE/TIME	
B1-LR-001-F	01	01/04/00 16:42:00	
B1-LR-002-W	02	01/04/00 16:45:00	
B1-LR-003-LF	03	01/04/00 16:47:00	
B1-MR1-001-F	04	01/04/00 16:50:00	
B1-MR1-002-W	05	01/04/00 16:52:00	
B1-MR1-003-LF	06	01/04/00 16:55:00	
B1-041-LF	. 07	01/04/00 17:05:00	
B1-042-LF	08	01/04/00 17:07:00	
B1-043-LF	09	01/04/00 14:10:00	
B1/OSA/C01/F	10	01/04/00	
B1/OSA/C02/W	11	01/04/00	
B1/OSA/003/LF	12	01/04/00	

Tom French/Vanessa May

Project Manager

CERTIFICATE OF ANALYSIS RESULTS BY SAMPLE

Page 1

SENT TETRA TECH, INC.

TO: 600 UNIVERSITY STREET **SUITE 800**

SEATTLE, WA 98101

PHIL SKORGE 206-587-4648 FAX 624-3679 BY:

ANALYZED PBS&J Analytical Services 6635 East Colonial Drive

Orlando, FL 32807

Phone: (407) 277-4443 Fax: (407) 382-8794

This is to certify that the following samples were analyzed using good laboratory practices to show the following results.

Sample ID: B1-LR-001-F		Lab ID:	0002001-01	Collected: 01	/04/00 16:4	2:00
TEST	RESULT	UNITS	METHOD	EXTRACTED	ANALYZED	BY
BERYLLIUM IN SWIPE	0.019	mg/ft^2	NIOSH 7300		01/06/00	dm
Sample ID: B1-LR-002-W		Lab ID:	0002001-02	Collected: 01	/04/00 16:4	5:00
TEST	RESULT	UNITS	METHOD	EXTRACTED	ANALYZED	BY
BERYLLIUM IN SWIPE	0.0014	mg/ft^2	NIOSH 7300		01/06/00	dm
Sample ID: B1-LR-003-LF		Lab ID:	0002001-03	Collected: 01	/04/00 16:4	7: ^ ^
TEST	RESULT	UNITS	METHOD	EXTRACTED	ANALYZED	= /= Yd
BERYLLIUM IN SWIPE	0.12	mg/ft^2	NIOSH 7300		01/06/00	dm
Sample ID: B1-MR1-001-F		Lab ID:	0002001-04	Collected: 01	/04/00 16:5	0:00
TEST	RESULT	UNITS	METHOD	EXTRACTED	ANALYZED	BY
BERYLLIUM IN SWIPE	0.021	mg/ft^2	NIOSH 7300		01/06/00	dm
Sample ID: B1-MR1-002-W		Lab ID:	0002001-05	Collected: 01	/04/00 16:5	2:00
TEST	RESULT	UNITS	METHOD	EXTRACTED	ANALYZED	BY
BERYLLIUM IN SWIPE	0.004	mg/ft^2	NIOSH 7300		01/06/00	dm

CERTIFICATE OF ANALYSIS RESULTS BY SAMPLE

ample ID: B1-MR1-003-LF		Lab ID:	0002001-06	Collected: 01	/04/00 16:5	5:00
TEST	RESULT	UNITS	METHOD	EXTRACTED	ANALYZED	BY
BERYLLIUM IN SWIPE	0.32	mg/ft^2	NIOSH 7300		01/06/00	dm
Sample ID: B1-041-LF		Lab ID:	0002001-07	Collected: 01	/04/00 17:0	5:00
TEST 44 1 1/2 1	RESULT	UNITS	METHOD	EXTRACTED	ANALYZED	BY
BERYLLIUM IN SWIPE	0.0017	mg/ft^2	NIOSH 7300		01/06/00	dm
Sample ID: B1-042-LF		Lab ID:	0002001-08	Collected: 01	/04/00 17:0	7:00
TEST	RESULT	UNITS	METHOD	EXTRACTED	ANALYZED	BY
BERYLLIUM IN SWIPE	0.0003	mg/ft^2	NIOSH 7300		01/06/00	dm
Sample ID: B1-043-LF		Lab ID:	0002001-09	Collected: 01	/04/00 14:10	0:00
ST No Mary 1	RESULT	UNITS	METHOD	EXTRACTED	ANALYZED	BY
BERYLLIUM IN SWIPE	0.0003	mg/ft^2	NIOSH 7300		01/06/00	dm
Sample ID: B1/OSA/C01/F		Lab ID:	0002001-10	Collected: 01	/04/00	
TEST	RESULT	UNITS	METHOD	EXTRACTED	ANALYZED	BY
BERYLLIUM IN SWIPE	0.00018	mg/ft^2	NIOSH 7300		01/06/00	dm
Sample ID: B1/OSA/C02/W		Lab ID:	0002001-11	Collected: 01	/04/00	
TEST	RESULT	UNITS	METHOD	EXTRACTED	ANALYZED	BY
BERYLLIUM IN SWIPE	0.00019	mg/ft^2	NIOSH 7300		01/06/00	dm
Sample ID: B1/OSA/003/LF		Lab ID:	0002001-12	Collected: 01	/04/00	
TEST	RESULT	UNITS	METHOD	EXTRACTED	ANALYZED	BY
LERYLLIUM IN SWIPE	0.00009	mg/ft^2	NIOSH 7300		01/06/00	dm

TETRA TECH, INC.
15400 NE 90th, Suite 100
1edmond, Washington 98052
(206) 883-1912
FAX (206) 881-6997

CHAIN O. CUSTODY

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DOCUMENT TETRA TECH, INC.

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CHAIN OF CUSTODY

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1700 (200) 001-0337																<u> </u>	\mathcal{M}	ハ		/ [<u>ے</u>				
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referenced samples recid

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<u>(A)</u>	TETRA TECH, INC. 15400 NE 9mh, Suite 100 Redmond, Washington 98052
H	Redmond, Washington 98052 (206) 993-1912 FAX (206) 861-6997

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REPORTED DATE: February 15, 2000

Page: 1 of 1 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle,, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: LOCKHEED BERYLLIUM ABATEMENT-WIPES

RECEIVED DATE: 04-FEB-00

PO#:

Area Wipe Samples

PBS&J Login Number: 0002-238

PBSJ Sample No.	Client Sample ID	Locator	Collection	date/time
0002-238-01	B5-FD2-020300		02/03/00	16:00:00
002-238-02	B3-NFD-020300		02/03/00	16:20:00
0002-238-03	B3-SUMP-020300		02/03/00	16:30:00
0002-238-04	TRIP BLANK		02/03/00	16:35:00

Thank you for using PBS&J Analytical Services

T. French

PBS&J Project Manager

Reported: February 15, 2000 11:28 AM

Page 1 of 1 Pages

02/04/00 02/04/00 DM

SENT Phil Skorge TO: Tetra Tech, Inc.

> 600 University Street, Suite 800 Seattle, WA 98101

(206)587-4648 FAX 624-3679

Metals in Swipe by ICAP

beryllium

PBS&J Project Manager: T. French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0002-238-1	Client ID B5-FD2-02030	0	Date Received 02/04/00	Site			Date & 02/03/0	Time Collected 00 16:00:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/04/00	02/04/00 DM
beryllium		.00103	mg/ft^2			.0000	15	
PBS&J Sample No. 0002-238-2	Client ID B3-NFD-02030	00	Date Received 02/04/00	Site			Date & 02/03/0	Time Collected 0 16:20:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/04/00	02/04/00 DM
beryllium		.00119	mg/ft^2			.0000	5	
PBS&J Sample No. 0002-238-3	Client ID B3-SUMP-020	300	Date Received 02/04/00	Site			Date & 02/03/0	Time Collected 0 16:30:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/04/00	02/04/00 DM
beryllium		.00079	mg/ft^2			.0000	5	
PBS&J Sample No. 0002-238-4	Client ID TRIP BLANK		Date Received 02/04/00	Site			Date & 02/03/0	Time Collected 0 16:35:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst

.mg/ft^2

.00038

NIOSH 7300

.00005

RA TECH, INC. 15400 NE 90th, Suite 100 Redmond, Washington 98052 (206) 883-1912 FAX (206) 881-6997

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REPORTED DATE: February 16, 2000

Page: 1 of 1 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle,, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: LOCKHEED BERYLLIUM ABATEMENT-WIPES

RECEIVED DATE: 10-FEB-00

PO#:

Area Wipe Samples

PBS&J Login Number: 0002-372

PBSJ Sample No.	Client Sample ID	Locator	Collection	date/time
0002-372-01	BE4-FL-006R		02/09/00	12:40:00
0002-372-02	FS/C/003		02/09/00	12:55:00
0002-372-03	FS/FL/001		02/09/00	13:00:00
0002-372-04	FS/W/002		02/09/00	13:05:00
0002-372-05	TRIP BLANK		02/09/00	00:00:00

Thank you for using PBS&J Analytical Services

PBS&J Project Manager

Reported: February 16, 2000 11:49 AM

Page 1 of 1 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

> 600 University Street, Suite 800 Seattle, WA 98101

(206)587-4648 FAX 624-3679

PBS&J Project Manager: T. French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0002-372-1	Client ID BE4-FL-006R		Date Received 02/10/00	Site			Date & 02/09/0	Time Colle 00 12:40:0	
Parameter		Results	Qual Units	Method	М	DL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH 7	7300		02/10/00	02/10/00) DM
beryllium		.00006	mg/ft^2		.0	0005			
PBS&J Sample No. 0002-372-2	Client ID FS/C/003		Date Received 02/10/00	Site			Date & 02/09/0	Time Colle 0 12:55:0	
Parameter		Results	Qual Units	Method	MI	DL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH 7	300	(02/10/00	02/10/00	DM
beryllium		.00019	mg/ft^2		.0	0005			
PBS&J Sample No. 0002-372-3	Client ID FS/FL/001		Date Received 02/10/00	Site			Date & 02/09/0	Time Colle 0 13:00:0	
Parameter		Results	Qual Units	Method	M	DL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH 7	300	(02/10/00	02/10/00	DM
beryllium		.00005	U mg/ft^2		.0	0005			
PBS&J Sample No. 0002-372-4	Client ID FS/W/002		Date Received 02/10/00	Site			Date & 02/09/0	Time Colle 0 13:05:0	
Parameter		Results	Qual Units	Method	Mi)L	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP		.,	NIOSH 7	300	(02/10/00	02/10/00	DM
beryllium		.00005	U .mg/ft^2	٠	.0	0005			
PBS&J Sample No. 0002-372-5	Client ID TRIP BLANK		Date Received 02/10/00	Site			Date & 02/09/0	Time Colle 0 00:00:0	
Parameter		Results	Qual Units	Method	MI	DL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH 7	300	(02/10/00	02/10/00	DN ·
beryllium		.00005	U mg/ft^2		.0	0005			



REPORTED DATE: February 23, 2000

Page: 1 of 1 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: LOCKHEED BERYLLIUM ABATEMENT-FILTERS

RECEIVED DATE: 03-FEB-00

PO#:

Air Filter Analysis

PBS&J Login Number: 0002-216

PBSJ Sample No.	Client Sample ID	Locator	Collection d	late/time
0002-216-01	BE4-FL-001R	**************************************	02/02/00	15:00:00
2002-216-02	TRIP BLANK		02/02/00	15:05:00

Thank you for using PBS&J Analytical Services

T Eranah

PBS&J Project Manager

Reported: February 23, 2000 02:14 PM

Page 1 of 1 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

beryllium

600 University Street, Suite 800 Seattle, WA 98101

(206)587-4648 FAX 624-3679

PBS&J Project Manager: T. French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0002-216-1	Client ID BE4-FL-001R		Date Receiv 02/03/00	ved Site		Date & 02/02/0	Time Collected 0 15:00:00
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH 7300		02/03/00	02/04/00 DM
beryllium		.105	mg/ft^2		.0000	5	
PBS&J Sample No. 0002-216-2	Client ID TRIP BLANK		Date Receiv 02/03/00	ved Site		Date & 02/02/0	Time Collectec 15:05:00
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH 7300		02/03/00	02/04/00 DM

.00005

.00005 U mg/ft^2

TETRA TECH 15400 NE 90th, S Redmond, Washir (206) 883-1912 FAX (206) 881-69	uite 100 igton 98052				C	HI Dá	A 	N 2	O I	F (CU	IS	TC) D	,					DO	CUME	ENT _		,
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DATE/TIME

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RELINQUISHED BY (signature)

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REPORTED DATE: February 23, 2000

Page: 1 of 2 Pages

To: Phil Skorge Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: LOCKHEED BERYLLIUM ABATEMENT-FILTERS

RECEIVED DATE: 02-FEB-00

PO#:

Air Filter Analysis

PBS&J Login Number: 0002-149

PBSJ Sample No.	Client Sample ID	Locator	Collection da	ite/time
0002-149-01	B3-AC-001		02/01/00	17:00:00
<u>2002-149-02</u>	B3-AC-002		02/01/00	17:05:00
0002-149-03	B4-AC-001		02/01/00	17:15:00
0002-149-04	B4-AC-002		02/01/00	17:20:00
0002-149-05	B5-AC-001		02/01/00	17:25:00
0002-149-06	B5-AC-002		02/01/00	17:30:00
0002-149-07	B45-W-012		02/01/00	17:35:00
0002-149-08	B3-W-013		02/01/00	17:40:00
0002-149-09	TRIP BLANK		02/01/00	00:00:00

Thank you for using PBS&J Analytical Services

T. French

Reported: February 23, 2000 01:34 PM Page 1 of 2 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

beryllium

600 University Street, Suite 800 Seattle, WA 98101

(206)587-4648 FAX 624-3679

PBS&J Project Manager: T. French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

,0,,0,,							
PBS&J Sample No. 0002-149-1	Client ID B3-AC-001		Date Receiv	ved Site		Date & 02/01/6	Time Collected 00 17:00:00
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst
Metals in Air	by ICAP			NIOSH 7300		02/02/00	02/02/00 DM
beryllium		.00005	U mg/filte	er	.0000)5	
PBS&J Sample No. 0002-149-2	Client ID B3-AC-002		Date Receiv	ved Site		Date & 02/01/0	Time Collected
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst
Metals in Air l	oy ICAP	33400		NIOSH 7300		02/02/00	02/02/00 DM
beryllium		.00005	U mg/filte	er	.0000	5	
PBS&J Sample No. 0002-149-3	Client ID B4-AC-001		Date Receiv 02/02/00	ved Site		Date & 02/01/0	Time Collected 00 17:15:00
Parameter	·	Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst
Metals in Air	oy ICAP			NIOSH 7300		02/02/00	02/02/00 DM
beryllium		.00005	U mg/filte	er	.0000	5	
PBS&J Sample No. 0002-149-4	Client ID B4-AC-002		Date Receiv	ved Site		Date & 02/01/0	Time Collected 00 17:20:00
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst
Metals in Air l	oy ICAP			NIOSH 7300		02/02/00	02/02/00 DM
beryllium		.00005	U mg/filte	er	.0000	5	
PBS&J Sample No. 0002-149-5	Client ID B5-AC-001		Date Receiv	ved Site		Date & 02/01/0	Time Collected 00 17:25:00
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst
Metals in Air h	oy ICAP			NIOSH 7300		02/02/00	02/02/00 D.

.00005

.00005 U mg/filter

Reported: February 23, 2000 01:34 PM

beryllium

Page 2 of 2 Pages

PBS&J Sample No. 0002-149-6	Client ID B5-AC-002		Date Receiv 02/02/00	ved Site		Date & Time Collected 02/01/00 17:30:00				
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst			
Metals in Air	oy ICAP		,	NIOSH 7300		02/02/00	02/02/00 DM			
beryllium		.00005	U mg/filte	er	.0000	5				
PBS&J Sample No. 0002-149-7	Client ID B45-W-012		Date Receiv	ved Site		Date & 02/01/0	Time Collected 00 17:35:00			
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst			
Metals in Swipe	by ICAP			NIOSH 7300		02/02/00	02/02/00 DM			
beryllium		.00009	mg/ft^2		.0000	5				
PBS&J Sample No. 0002-149-8	Client ID B3-W-013		Date Receiv	ved Site	Date & Time Collected 02/01/00 17:40:00					
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst			
Metals in Swipe	by ICAP			NIOSH 7300		02/02/00	02/02/00 DM			
beryllium		.00176	mg/ft^2		.0000	5				
PBS&J Sample No. 0002-149-9	Client ID TRIP BLANK		Date Receiv 02/02/00	ved Site		Date & 02/01/0	Time Collected 0 00:00:00			
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst			
Metals in Swipe	e by ICAP			NIOSH 7300		02/02/00	02/02/00 DM			

.00005

.00005 U mg/ft^2



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B45-W-012	1735	2-1-00							1		V										-7	
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Chemical Testing Environmental Toxicology Field Services

Certificate of Analysis

REPORTED DATE: March 01, 2000

Page: 1 of 1 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: LOCKHEED

PBS&J Login Number: 0002-374

RECEIVED DATE: 10-FEB-00

PO#:

PBSJ Sample No.	Client Sample ID	Collection date/time
0002-374-01	CHROM-DUCT 020900	02/09/00 09:00:00

Thank you for using PBS&J Analytical Services

T. French

PBS&J Project Manager

Reported: March 01, 2000 09:46 AM

Page 1 of 2 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

600 University Street, Suite Seattle, WA 98101

0-

FAX -

PBS&J Project Manager: T. French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0002-374-1	Client ID CHROM-DUCT	020900		Date Rece 02/10/00	eived	Site		Date & 02/09/0	Time Collect 00 09:00:00	
Parameter		Results	Qı	ual Units	N	lethod	MDL	Prepdate	Analyzed /	Analyst
Determination of Chlorinated Pes					EP <i>F</i>	8081A		02/15/00	02/16/00	WJ
gamma-BHC		1	U	ug/l						
chlordane(techr	nical)	1	U	ug/l				-)
endrin		5	U	ug/l						
heptachlor		1	U	ug/l						
methoxychlor		15	U	ug/l						
heptachlor epox	xide	1	Ū	ug/l						
toxaphene		100	Ū	ug/l						
Surrogate Recov	veries				EPA	8081A		02/15/00	02/16/00	WJ
tetrachloro-m-x	kylene	77		જ						
Decachlorobiphe	enyl	75		%						
Mercury in Wate	ers				EPA	245.1/7470)	02/21/00	02/22/00	DMS
mercury		.002	U	mg/l			.002			
Metals in TCLP ICAP	Leachates by	•			EPA	6010		02/22/00	02/23/00	DM
arsenic		5	U	mg/1		•				
barium		10	U	mg/l						
cadmium		5	U	mg/l						
chromium		2.395		mg/l						
lead		1.5	U	mg/l						
selenium		2	U	mg/l						
silver		1	U	mg/l						,
Determination of Chlorinated Her					EPA	8151		02/15/00	02/17/00	R . ()

Reported: March 01, 2000 09:46 AM

Page 2 of 2 Pages

PBS&J Sample No. 0002-374-1

Client ID CHROM-DUCT 020900

Date Received 02/10/00

Site

Date & Time Collected

02/09/00 09:00:00

1002-314-1 OTTION-DO	01 020000	V	EJ 10/00			02.00.0	00.00.0	
Parameter	Results	Qual	Units	Method	MDL	Prepdate	Analyzed	Analyst
TCLP Leachates				_				
2,4-D	.01	U	mg/l					
2,4,5-TP	.01	U	mg/l					
Surrogate Recovery				EPA 8151		02/15/00	02/17/00	RP
2,4-dichlorophenylacetic acid	62		9					

RA TECH, IN
15400 NE 90th, Suite 1
Redmond, Washington
(206) 883-1912
FAY (206) 881-6997

98052

CHAIN OF CUSTODY

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Chemical Testing Environmental Toxicology Field Services

Certificate of Analysis

REPORTED DATE: March 09, 2000

Page: 1 of 1 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: ABC FACILITY

PBS&J Login Number: 0001-558

RECEIVED DATE: 21-JAN-00

PO#:

PBSJ Sample No.	Client Sample ID	The table of the second		Collection	date/time	!
0001-558-01	PA/FL/001	1)))	4 4 Blooming of the state of th	01/18/00	15:00:00	
0001-558-02	PA/CEIL/002			01/18/00	15:05:00	٠
0001-558-03	PAW/003		1	01/18/00	15:10:00	
0001-558-04	82/W/026R		!	01/18/00	15:20:00	
0001-558-05	B2/FL/046R	•	!	01/18/00	15:30:00	
0001-558-06	DUCT			01/18/00	15:40:00	
0001-558-07	ТВ			01/18/00	00:00:00	

Thank you for using PBS&J Analytical Services

T.French

PBS&J Project Manager

Reported: March 09, 2000 04:18 PM

Page 1 of 2 Pages

Date & Time Collected

SENT Phil Skorge TO: Totra Tech, Inc.

PBS&J Sample No.

600 University Street, Suite 800 Seattle, WA 98101 (206)587-4648 FAX 624-3679

PBS&J Project Manager: T.French

Client ID

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

Date Received

Site

0001-558-1	PA/FL/001		01/21/00	1400			01/18/	00 15:00:00	0
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP	*		NIOSH	7300		01/19/00	01/19/00	DM
beryllium		.00005	ບ mg/ft^2			.00005)		
chromium		.00005	U mg/ft^2			.00005	i		X
PBS&J Sample No. 0001-558-2	Cilent ID PA/CEIL/002		Date Recei 01/21/00	ived	Site		Date & 01/18/0	Time Collec 00 15:05:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by TCAP			NIOSH	7300		01/19/00	01/19/00	DM
beryllium		.0017	mg/ft^2			.00005	•		
chromium		.013	mg/ft^2			.00005	•		
PB\$&J Sample No. 0001-558-3	Cilent ID PA/W/003		Date Recei 01/21/00	ved	Site		Date & 01/18/0	Time Collec 00 16:10:00	
Parameter		Results	Quel Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by · ICAP			NIOSH	7300		01/19/00	01/19/00	DM
boryllium		.0002	mg/ft^2		•	.00005	•		
chromium		.0003	mg/ft^2			.00005	•		
PBS&J Sample No. 0001-558-4	Client ID B2/W/026R		Date Recel 01/21/00	lved	Site		Date & 01/18/0	Time Collec 00 15:20:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by · ICAP			NIOSH	7300		01/19/00	01/19/00	DM
beryllium		.00005	U mg/ft^2		•	.00005	i		
chromium		.00005	U mg/ft^2			.00005	i		• *
PBS&J Sample No.	Client ID			•					

Reported: March 09, 2000 04:18 PM

Page 2 of 2 Pages

PBS&J Sample No. 0001-558-5	Client ID B2/FL/046R		Date Recei 01/21/00	ived	Site		Date & 01/18/0	Time Collected 00 15:30:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	∍ by ICAP			итозн	730Ó		01/19/00	01/19/00 DM
beryllium		8100.	mg/ft^2			.0000	<u>t</u> ,	
chromium		.00005	U mg/ft^2			,0000	5	
PBS&J Sample No. 0001-558-6	Client ID DUCT		Date Recei 01/21/00	ived	Site		Date & 01/18/0	Time Collected 00 15:40:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/19/00	01/19/00 DM
beryllium		.013	mg/ft^2			.0000	5	
chromium		.13	mg/ft^2			.0000	5	
PBS&J Sample No. 31-558-7	Client ID TB		Date Recei	lved	Site		Date & 01/18/0	Time Collected 00 00:00:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NJOSH	7300		01/19/00	01/19/00 DM
beryllium		.00005	U mg/ft^2			.0000	5	
chromium		.00005	U mg/ft^2			. 0000	5	

÷.,



REPORTED DATE: March 24, 2000

Page: 1 of 3 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle,, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: LOCKHEED BERYLLIUM ABATEMENT-WIPES

Area Wipe Samples

PBS&J Login Number: 0002-134

RECEIVED DATE: 01-FEB-00

PO#:

PBSJ Sample No.	Client Sample ID	Collection date/time
0002-134-01	B3-FL-001	01/31/00 13:00:00
0002-134-02	B3-FL-002	01/31/00 13:05:00
) 0002-134-03	B3-FL-003	01/31/00 13:10:00
0002-134-04	B3-FL-004	01/31/00 13:15:00
0002-134-05	B3-FL-005	01/31/00 13:20:00
0002-134-06	B3-W-006	01/31/00 13:25:00
0002-134-07	B3-W-007	01/31/00 13:30:00
0002-134-08	B3-W-008	01/31/00 13:35:00
0002-134-09	B3-W-009	01/31/00 13:40:00
0002-134-10	B3-W-010	01/31/00 13:45:00
0002-134-11	B3-W-011	01/31/00 13:50:00
0002-134-12	B3-W-012	01/31/00 13:55:00
0002-134-13	B3-LF-014	01/31/00 14:05:00
0002-134-14	B3-LF-015	01/31/00 14:10:00
)002-134-15	B3-LF-016	01/31/00 14:15:00



REPORTED DATE: March 24, 2000 Page: 2 of 3 Pages

PBSJ Sample No.	Client Sample ID	Collection date/time
0002-134-16	B3-LF-017	01/31/00 14:20:00
0002-134-17	B3-LF-018	01/31/00 14:25:00
0002-134-18	B3-LF-019	01/31/00 14:30:00
0002-134-19	B3-LF-020	01/31/00 14:35:00
0002-134-20	B3-LF-021	01/31/00 14:40:00
0002-134-21	B45-FL-001	01/31/00 14:45:00
0002-134-22	B45-FL-002	01/31/00 14:50:00
0002-134-23	B45-FL-003	01/31/00 14:55:00
0002-134-24	B45-FL-004	01/31/00 15:00:00
0002-134-25	B45-FL-005	01/31/00 15:05:00
0002-134-26	B45-FL-006	01/31/00 15:10:00
0002-134-27	B45-FL-007	01/31/00 15:15:00
0002-134-28	B45-W-008	01/31/00 15:20:00
0002-134-29	B45-W-009	01/31/00 15:25:00
0002-134-30	B45-W-010	01/31/00 15:30:00
0002-134-31	B45-W-011	01/31/00 15:35:00
0002-134-32	B45-W-013	01/31/00 15:45:00
0002-134-33	B45-W-014	01/31/00 15:50:00
0002-134-34	B45-LF-015	01/31/00 15:55:00
0002-134-35	B45-LF-016	01/31/00 16:00:00
0002-134-36	B45-LF-017	01/31/00 16:05:00
0002-134-37	B45-LF-018	01/31/00 16:10:00



REPORTED DATE: March 24, 2000 Page: 3 of 3 Pages

PBSJ Sample No.	Client Sample ID	Collection date/time
0002-134-38	B45-LF-019	01/31/00 16:15:00
0002-134-39	B45-LF-020	01/31/00 16:20:00
0002-134-40	B45-LF-021	01/31/00 16:25:00
0002-134-41	OCSR-FL-001	01/31/00 16:30:00
0002-134-42	OCSR-W-002	01/31/00 16:35:00
0002-134-43	OCSR-C-003	01/31/00 16:40:00
0002-134-44	BE4-FL-001	01/31/00 16:45:00
0002-134-45	BE4-W-002	01/31/00 16:50:00
0002-134-46	BE4-C-003	01/31/00 16:55:00
,0002-134-47	TRIP BLANK	01/31/00 17:00:00

Thank you for using PBS&J Analytical Services

T French

PBS&J Project Manager

Reported: March 24, 2000 07:18 AM

Page 1 of 8 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

> 600 University Street, Suite 800 Seattle,, WA 98101 (206)587-4648 FAX 624-3679

PBS&J Project Manager: T. French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0002-134-1	Client ID B3-FL-001		Date Rece 02/01/00	ived	Site		Date & 01/31/0	Time Collecte	ed
Parameter	_	Results Qua	I Units	Method		MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM
beryllium		.000632	mg/ft^2			.0000	5		
PBS&J Sample No. 0002-134-2	Client ID B3-FL-002	-	Date Rece 12/01/00	ived	Site		Date & 01/31/0	Time Collecto 0 13:05:00	ed
Parameter		Results Qua	ıl Units	Method		MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP	• • • • • • • • • • • • • • • • • • • •		NIOSH	7300		02/01/00	02/01/00	DM
beryllium		.000516	mg/ft^2			.0000	5		
PBS&J Sample No. 0002-134-3	Client ID B3-FL-003	_	Date Recei	ived	Site		Date & 01/31/0	Time Collecte	ed
Parameter		Results Qua	l Units	Method		MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP	-		NIOSH	7300		02/01/00	02/01/00	DM
beryllium		.000285	mg/ft^2			.0000	5		
PBS&J Sample No. 0002-134-4	Client ID B3-FL-004	-	Date Recei	ived	Site		Date & 01/31/0	Time Collecte 10 13:15:00	ed
Parameter		Results Qua	Units	Method		MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP			иіоѕн	7300		02/01/00	02/01/00	DM
beryllium		.000091	mg/ft^2			.0000	5		
PBS&J Sample No. 0002-134-5	Client ID B3-FL-005	_	Date Recei 2/01/00	ived	Site		Date & 01/31/0	Time Collecte 0 13:20:00	∌d
Parameter		Results Qua	l Units	Method		MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	D';;
beryllium		.00452	mg/ft^2			.0000	5		*

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PBS&J Sample No. 0002-134-6	Client ID B3-W-006		Date Reco	eived	Site		Date & 01/31/6	Time Collected 00 13:25:00
Parameter		Results	Qual Units	Method	l	MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM
beryllium		.0015	mg/ft^:	2		.0000)5	*
PBS&J Sample No. 0002-134-7	Client ID B3-W-007		Date Rece 02/01/00	eived	Site		Date & 01/31/0	Time Collected 00 13:30:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM
beryllium		.00009	mg/ft^2	2		.0000)5	
PBS&J Sample No. 0002-134-8	Client ID B3-W-008		Date Rece 02/01/00	eived	Site		Date & 01/31/0	Time Collected 00 13:35:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP		30.000	NIOSH	7300		02/01/00	02/01/00 DM
beryllium		.00009	mg/ft^2	2		.0000	15	
PBS&J Sample No. 0002-134-9	Client ID B3-W-009		Date Rece 02/01/00	eived	Site		Date & 01/31/0	Time Collected 00 13:40:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM
beryllium		.00060	3 mg/ft^2	2		.0000	5	
PBS&J Sample No. 0002-134-10	Client ID B3-W-010		Date Rece 02/01/00	eived	Site		Date & 01/31/0	Time Collected 0 13:45:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM
beryllium		.00064	5 mg/ft^2	2		.0000	5	
PBS&J Sample No. 0002-134-11	Client ID B3-W-011		Date Rece 02/01/00	eived	Site		Date & 01/31/0	Time Collected 0 13:50:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP		•	NIOSH	7300		02/01/00	02/01/00 DM
beryllium		.00005	U mg/ft^2	2		.0000	5	
PBS&J Sample No. 0002-134-12	Client ID B3-W-012		Date Rece 02/01/00	eived	Site		Date & 01/31/0	Time Collected 0 13:55:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst

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PBS&J Sample No. 0002-134-12	Client ID B3-W-012		Date Rec 02/01/00	eived	Site		Date & 01/31/0	Time Collec 00 13:55:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM
beryllium		.00008	mg/ft^	2		.0000	5		
PBS&J Sample No. 0002-134-13	Client ID B3-LF-014		Date Rec 02/01/00	eived	Site		Date & 01/31/0	Time Collec 00 14:05:00	
Parameter		Results	Qual Units	Method	l	MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM
beryllium		.00154	mg/ft^:	2		.0000	5		
PBS&J Sample No. 0002-134-14	Client ID B3-LF-015		Date Reco	eived	Site		Date & 01/31/0	Time Collec 00 14:10:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM .
beryllium		.00146	mg/ft^2	2		.0000	5		١.,
PBS&J Sample No. 0002-134-15	Client ID B3-LF-016		Date Rece 02/01/00	eived	Site		Date & 01/31/0	Time Collec 00 14:15:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM
beryllium		.00099	mg/ft^2	2		.0000	5		
PBS&J Sample No. 0002-134-16	Client ID B3-LF-017		Date Rece 02/01/00	eived	Site		Date & 01/31/0	Time Collect 0 14:20:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	NIOSH	7300		02/01/00	02/01/00	DM
beryllium		.00909	mg/ft^2	2		.0000	5		
PBS&J Sample No. 0002-134-17	Client ID B3-LF-018		Date Rece 02/01/00	eived	Site		Date & 01/31/0	Time Collect 0 14:25:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed A	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM
beryllium		.00053	5 mg/ft^2	2		.0000	5		
PBS&J Sample No. 0002-134-18	Client ID B3-LF-019		Date Rece 02/01/00	eived	Site		Date & 01/31/0	Time Collect 0 14:30:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed /	Analy

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PBS&J Sample No. 0002-134-18	Client ID B3-LF-019		Date Rec 02/01/00	eived	Site		Date & 01/31/0	Time Collected 0 14:30:00		
Parameter		Results	Qual Units	Method	l	MDL	Prepdate	Analyzed Analy		
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM		
beryllium		.0018	mg/ft^	2		.0000	5			
PBS&J Sample No. 0002-134-19	Client ID B3-LF-020	Date Received Site 02/01/00			Date & Time Collected 01/31/00 14:35:00					
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analy		
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM		
beryllium		.00457	mg/ft^.	2		.0000	5			
PBS&J Sample No. 0002-134-20	Client ID B3-LF-021	Date Received Site 02/01/00					Date & Time Collected 01/31/00 14:40:00			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analy		
Metals in Swipe	by ICAP			NIOSH	7300	-	02/01/00	02/01/00 DM		
beryllium		.00022	7 mg/ft^:	2		.0000	5			
PBS&J Sample No. 0002-134-21	Client ID B45-FL-001	Date Received Site 02/01/00				Date & Time Collected 01/31/00 14:45:00				
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analy		
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM		
beryllium		.00084	9 mg/ft^2	2		.0000	5			
PBS&J Sample No. 0002-134-22	Client ID B45-FL-002	Date Received Site 02/01/00			Date & Time Collected 01/31/00 14:50:00					
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analy		
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM		
beryllium		.004	mg/ft^2	2		.0000	5			
PBS&J Sample No. 0002-134-23	Client ID B45-FL-003		Date Rece 02/01/00	eived	Site		Date & 01/31/0	Time Collected 0 14:55:00		
Parameter	·	Results	Qual Units	Method		MDL	Prepdate =	Analyzed Analy		
Metals in Swipe	by ICAP	· · · · · · · · · · · · · · · · · · ·		NIOSH	7300		02/01/00	02/01/00 DM		
beryllium		.00394	mg/ft^2	2		.0000	5			
PBS&J Sample No. 0002-134-24	Client ID B45-FL-004		Date Rece 02/01/00	eived	Site		Date & 01/31/0	Time Collected 0 15:00:00		
Parameter		Results	Qual Units							

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PBS&J Sample No. 0002-134-24	Client ID B45-FL-004		Date Rece 02/01/00	ived	Site		Date & Time Collected 01/31/00 15:00:00			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ana	lyst	
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 D	M	
beryllium		.00114	mg/ft^2	2		.0000	5			
PBS&J Sample No. 0002-134-25	Client ID B45-FL-005	Date Received Site 02/01/00				Date & Time Collected 01/31/00 15:05:00				
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ana	lyst	
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 D	M	
beryllium		.006	mg/ft^2			.0000	5			
PBS&J Sample No. 0002-134-26	Client ID B45-FL-006	Date Received Site 02/01/00					Date & Time Collected 01/31/00 15:10:00			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ana	lyst	
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 D	М	
beryllium		.00358	mg/ft^2			.0000	5			
PBS&J Sample No. 0002-134-27	Client ID B45-FL-007	Date Received Site 02/01/00					Date & Time Collected 01/31/00 15:15:00			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Anal	lyst	
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DI	M	
beryllium		.0012	mg/ft^2			.0000	5			
PBS&J Sample No. 0002-134-28	Client ID B45-W-008		Date Rece 02/01/00	ived	Site	Date & Time Collected 01/31/00 15:20:00				
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Anal	lyst	
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DI	М	
beryllium		.00438	mg/ft^2			.0000	5			
PBS&J Sample No. 0002-134-29	Client ID B45-W-009		Date Rece 02/01/00	ived	Site		Date & 01/31/0	Time Collected 0 15:25:00		
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Anal	lyst	
Metals in Swipe	by ICAP		•	NIOSH	7300		02/01/00	02/01/00 DI	M	
beryllium		.00216	mg/ft^2			.0000	5			
PBS&J Sample No. 0002-134-30	Client ID B45-W-010	Date Received Site 02/01/00				Date & Time Collected 01/31/00 15:30:00				
Parameter	_	Results	Qual Units	Method		MDL	Prepdate	Analyzed Anal		

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Date & Time Collected Client ID Site PBS&J Sample No. Date Received 15:30:00 0002-134-30 B45-W-010 02/01/00 01/31/00 Results Method MDL Prepdate Analyzed Analyst Qual Units Parameter Metals in Swipe by ICAP 02/01/00 02/01/00 DM NIOSH 7300 mg/ft^2 beryllium .000689 .00005 Client ID Site Date & Time Collected PBS&J Sample No. **Date Received** B45-W-011 0002-134-31 01/31/00 15:35:00 02/01/00 Parameter Results Qual Units Method MDL Prepdate Analyzed Analyst Metals in Swipe by ICAP 02/01/00 02/01/00 NIOSH 7300 beryllium .000395 mg/ft^2 .00005 PBS&J Sample No. Client ID **Date Received** Site **Date & Time Collected** 0002-134-32 B45-W-013 01/31/00 15:45:00 02/01/00 Results Qual Units Method Analyzed Analyst Parameter MDL Prepdate Metals in Swipe by ICAP 02/01/00 NIOSH 7300 02/01/00 mg/ft^2 .00005 beryllium .0025 PBS&J Sample No. Client ID Site **Date & Time Collected Date Received** 0002-134-33 B45-W-014 02/01/00 01/31/00 15:50:00 Qual Units Method MDL Analyzed Analyst Results Prepdate **Parameter** Metals in Swipe by ICAP NIOSH 7300 02/01/00 02/01/00 beryllium .000096 mg/ft^2 .00005 PBS&J Sample No. Client ID **Date Received** Site **Date & Time Collected** 0002-134-34 B45-LF-015 02/01/00 01/31/00 15:55:00 Results Qual Units Method MDL Prepdate Analyzed Analyst Parameter Metals in Swipe by ICAP NIOSH 7300 02/01/00 02/01/00 DM mg/ft^2 .00005 beryllium .0031 **Date & Time Collected** PBS&J Sample No. Client ID **Date Received** Site 16:00:00 0002-134-35 B45-LF-016 02/01/00 01/31/00 Analyzed Analyst Results Qual Units Method MDL Prepdate Parameter Metals in Swipe by ICAP NIOSH 7300 02/01/00 02/01/00 .00158 mg/ft^2 .00005 beryllium Site Date & Time Collected PBS&J Sample No. Client ID **Date Received** 16:05:00 0002-134-36 B45-LF-017 02/01/00 01/31/00 Results Qual Units Method MDL Analyzed Analyst Prepdate **Parameter**

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PBS&J Sample No. 0002-134-36	Client ID B45-LF-017		Date Rece 02/01/00	eived	Site		Date & Time Collected 01/31/00 16:05:00		
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM
beryllium		.00080	5 mg/ft^2	2		.0000	5		
PBS&J Sample No. 0002-134-37	Client ID B45-LF-018	Date Received Site 02/01/00				Date & Time Collected 01/31/00 16:10:00			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed A	naiyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM
beryllium		.00109	mg/ft^2	2		.0000	5		
PBS&J Sample No. 0002-134-38	Client ID B45-LF-019	Date Received Site 02/01/00				Date & Time Collected 01/31/00 16:15:00			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM .
beryllium		.00563	mg/ft^2	?		.0000	5		
PBS&J Sample No. 0002-134-39	Client ID B45-LF-020	Date Received Site 02/01/00			Date & Time Collected 01/31/00 16:20:00				
Parameter		Results	Qual Units	Method	**************************************	MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM
beryllium		.00082	4 mg/ft^2	!		.0000	5		
PBS&J Sample No. 0002-134-40	Client ID B45-LF-021		Date Rece 02/01/00	ived	Site		Date & Time Collected 01/31/00 16:25:00		ed
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM
beryllium		.00263	mg/ft^2	!		.0000	5		
PBS&J Sample No. 0002-134-41	Client ID OCSR-FL-001		Date Rece 02/01/00	ived	Site		Date & 01/31/0	Time Collecte 0 16:30:00	ed
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM
beryllium		.00124	mg/ft^2			.0000	5		
PBS&J Sample No. 0002-134-42	Client ID OCSR-W-002		Date Rece 02/01/00	ived	Site		Date & Time Collected 01/31/00 16:35:00		
Parameter		Results	Qual Units	Method	·····	MDL	Prepdate	Analyzed A	na

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beryllium

Client ID Site Date & Time Collected PBS&J Sample No. **Date Received** OCSR-W-002 01/31/00 16:35:00 0002-134-42 02/01/00 Results Qual Units Method MDL Prepdate Analyzed Analyst Parameter Metals in Swipe by ICAP 02/01/00 NIOSH 7300 02/01/00 .00005 .00529 mq/ft^2 beryllium Date & Time Collected Client ID Site **Date Received** PBS&J Sample No. 16:40:00 OCSR-C-003 01/31/00 0002-134-43 02/01/00 Results Qual Units Method MDL Prepdate Analyzed Analyst **Parameter** 02/01/00 Metals in Swipe by ICAP NIOSH 7300 02/01/00 DM mg/ft^2 .00005 beryllium .000119 Client ID Site Date & Time Collected **Date Received** PBS&J Sample No. BE4-FL-001 02/01/00 01/31/00 16:45:00 0002-134-44 Results Qual Units Method MDL Analyzed Analyst Prepdate **Parameter** Metals in Swipe by ICAP 02/01/00 02/01/00 NIOSH 7300 .376 mg/ft^2 .00005 beryllium **Date & Time Collected** PBS&J Sample No. Client ID **Date Received** Site 0002-134-45 BE4-W-002 02/01/00 01/31/00 16:50:00 Qual Units Method Analyzed Analyst Parameter Results MDL Prepdate Metals in Swipe by ICAP NIOSH 7300 02/01/00 02/01/00 DM mg/ft^2 beryllium .00005 .00144 Client ID Site **Date & Time Collected** PBS&J Sample No. **Date Received** BE4-C-003 16:55:00 0002-134-46 02/01/00 01/31/00 Results Qual Units Method MDL Analyzed Analyst Prepdate **Parameter** Metals in Swipe by ICAP 02/01/00 02/01/00 DM NIOSH 7300 beryllium .0047 mg/ft^2 .00005 Client ID Site **Date & Time Collected** PBS&J Sample No. **Date Received** TRIP BLANK 17:00:00 01/31/00 0002-134-47 02/01/00 Results Qual Units Method MDL Analyzed Analyst Parameter Prepdate DM Metals in Swipe by ICAP NIOSH 7300 02/01/00 02/01/00

U mg/ft^2

.00005

.00005

TETRA TECH, INC. 15400 NE 90th, Suite 100 Redmond, Washington 98052 (206) 883-1912 FAX (206) 881-6997

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RA TECH, INC. 15400 NE 90th, Suite 100 Redmond, Washington 98052 (206) 883-1912 FAX (206) 881-6997

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TETRA TECH, INC. 15400 NE 90th, Suite 100 Redmond, Washington 98052 (206) 883-1912 FAX (206) 881-6997

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PAGE 3 OF 3

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REPORTED DATE: March 24, 2000

Page: 1 of 2 Pages

To: Phil Skorge Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: LOCKHEED

SARASOTA

PBS&J Login Number: 0003-572

RECEIVED DATE: 23-MAR-00

PO#:

PBSJ Sample No.	Client Sample ID	Collection date/time
0003-572-01	B45-FL-003	01/31/00 00:00:00
0003-572-02	B45-FL-004	01/31/00 00:00:00
0003-572-03	B45-FL-005	01/31/00 00:00:00
0003-572-04	B45-FL-006	01/31/00 00:00:00
0003-572-05	B45-FL-007	01/31/00 00:00:00
0003-572-06	B45-W-011	01/31/00 00:00:00
0003-572-07	B45-W-012	02/01/00 17:35:00
0003-572-08	B45-W-013	01/31/00 00:00:00
0003-572-09	B45-W-014	01/31/00 00:00:00
0003-572-10	B45-IF-018	01/31/00 00:00:00
0003-572-11	B45-IF-019	01/31/00 00:00:00
0003-572-12	B45-IF-020	01/31/00 00:00:00
0003-572-13	B45-IF-021	01/31/00 00:00:00
0003-572-14	B45-IF-022	. 01/31/00 00:00:00
0003-572-15	B5-FD2-02030	02/03/00 16:00:00



REPORTED DATE: March 24, 2000

Page: 2 of 2 Pages

Thank you for using PBS&J Analytical Services

T. Ffench

PBS&J Project Manager

Reported: March 24, 2000 07:19 AM

Page 1 of 3 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

> 600 University Street, Suite 800 Seattle, WA 98101

(206)587-4648 FAX 624-3679

PBS&J Project Manager: T. French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0003-572-1	Client ID B45-FL-003		Date Rece 03/23/00	eived	Site SARASOTA		Date & 01/31/	Time Collected 00 00:00:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM
chromium		.011	mg/ft^2	?		.0000	5	
BS&J Sample No. J003-572-2	Client ID B45-FL-004		Date Rece 03/23/00	ived	Site SARASOTA		Date & 01/31/0	Time Collected 00 00:00:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM
chromium		.0033	mg/ft^2	!		.0000	5	
PBS&J Sample No. 0003-572-3	Client ID B45-FL-005		Date Rece 03/23/00	ived	Site SARASOTA		Date & 01/31/0	Time Collected 00 00:00:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM
chromium		.064	mg/ft^2			.0000	5	
PBS&J Sample No. 0003-572-4	Client ID B45-FL-006		Date Recei 03/23/00	ived	Site SARASOTA		Date & 01/31/0	Time Collected 00 00:00:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM
chromium		.011	mg/ft^2			.0000	5	
PBS&J Sample No. 0003-572-5	Client ID B45-FL-007		Date Recei 03/23/00	ived	Site SARASOTA		Date & 01/31/0	Time Collected 0 00:00:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM
chromium		.013	mg/ft^2			.0000	5	

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Page 2 of 3 Pages

PBS&J Sample No. 0003-572-6	Client ID B45-W-011		Date Rece 03/23/00	eived	Site SARASOTA		Date & 01/31/6	Time Collec	
Parameter		Results	Qual Units	Method	i	MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	1 7300		02/01/00	02/01/00	DM
chromium		.0015	mg/ft^2	2		.0000	5		
PBS&J Sample No. 0003-572-7	Client ID B45-W-012		Date Rece 03/23/00	eived	Site SARASOTA		Date & 02/01/0	Time Collect 00 17:35:0	
Parameter		Results	Qual Units	Method	1	MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP		-	NIOSH	7300		02/02/00	02/02/00	DM
chromium		.00016	mg/ft^2	2		.0000	5		
PBS&J Sample No. 0003-572-8	Client ID B45-W-013		Date Rece 03/23/00	eived	Site SARASOTA		Date & 01/31/0	Time Collection 00:00:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM
chromium		.0033	mg/ft^2	2		.0000	5		
PBS&J Sample No. 0003-572-9	Client ID B45-W-014		Date Rece 03/23/00	eived	Site SARASOTA		Date & 01/31/0	Time Collec 00 00:00:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM
chromium		.0016	mg/ft^2	2		.00009	5		
PBS&J Sample No. 0003-572-10	Client ID B45-IF-018		Date Rece 03/23/00	eived	Site SARASOTA		Date & 01/31/0	Time Collec 00 00:00:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM
chromium		.0014	mg/ft^2	?	4	.00005	5		
PBS&J Sample No. 0003-572-11	Client ID B45-IF-019		Date Rece 03/23/00	ived	Site SARASOTA		Date & 01/31/0	Time Collec 0 00:00:00	
Parameter		Results	Qual Units	Method	· ·	MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00	DM
chromium		.0307	mg/ft^2	2		.00005	5		
PBS&J Sample No. 0003-572-12	Client ID B45-IF-020		Date Rece 03/23/00	ived	Site SARASOTA		Date & 01/31/0	Time Collec 0 00:00:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analy

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PBS&J Sample No. 0003-572-12	Client ID B45-IF-020		Date Rece 03/23/00	eived	Site SARASOTA		Date & 01/31/0	Time Collected 00 00:00:00
Parameter		Results	Qual Units	Method	3	MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM
chromium		.0097	mg/ft^2	?		.0000	15	
PBS&J Sample No. 0003-572-13	Client ID B45-IF-021		Date Rece 03/23/00	eived	Site SARASOTA		Date & 01/31/0	Time Collected 00 00:00:00
Parameter		Results	Qual Units	Method	i	MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300	-	02/01/00	02/01/00 DM
chromium		.034	mg/ft^2			.0000	5	
PBS&J Sample No. 0003-572-14	Client ID B45-IF-022		Date Rece 03/23/00	ived	Site SARASOTA		Date & 01/31/0	Time Collected 00 00:00:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/01/00	02/01/00 DM
jchromium		.0061	mg/ft^2			.0000	5	
PBS&J Sample No. 0003-572-15	Client ID B5-FD2-02030		Date Rece 03/23/00	ived	Site SARASOTA		Date & 02/03/0	Time Collected 0 16:00:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		02/04/00	02/04/00 DM
chromium		.0036	mg/ft^2			.0000	5	

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REPORTED DATE: February 08, 2000

Page: 1 of 3 Pages

To: Phil Skorge Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: ABC FACILITY

RECEIVED DATE: 05-JAN-00

PO#:

PBS&J Login Number: 0001-545

PBSJ Sample No.	Client Sample ID	Locator	Collection	date/time
0001-545-01	B1-001-FL		01/04/00	15:00:00
0001-545-02	B1-002-FL		01/04/00	15:02:00
0001-545-03	B1-003-FL		01/04/00	15:05:00
0001-545-04	B1-004-FL		01/04/00	15:07:00
0001-545-05	B1-005-FL		01/04/00	15:10:00
0001-545-06	B1-006-FL		01/04/00	15:12:00
0001-545-07	B1-007-FL		01/04/00	15:15:00
0001-545-08	B1-008-FL		01/04/00	15:17:00
0001-545-09	B1-009-FL		01/04/00	15:20:00
0001-545-10	B1-010-FL		01/04/00	15:22:00
0001-545-11	B1-011-FL		01/04/00	15:25:00
0001-545-12	B1-012-FL		01/04/00	15:27:00
0001-545-13	B1-013-FL		01/04/00	15:30:00
0001-545-14	B1-014-FL		01/04/00	15:32:00



REPORTED DATE: February 08, 2000

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PBSJ Sample No.	Client Sample ID	Locator	Collection	date/time
0001-545-15	B1-015-FL	Applications of a section of the sec	01/04/00	15:35:00
0001-545-16	B1-016-FL		01/04/00	15:37:00
0001-545-17	B1-017-FL		01/04/00	15:40:00
0001-545-18	B1-018-FL		01/04/00	15:45:00
0001-545-19	B1-019-W		01/04/00	00:00:00
0001-545-20	B1-020-W		01/04/00	15:47:00
0001-545-21	B1-021-W		01/04/00	15:50:00
0001-545-22	B1-023-W	•	01/04/00	15:55:00
0001-545-23	B1-024-W		01/04/00	15:57:00
0001-545-24	B1-026-W		01/04/00	16:02:00
0001-545-25	B1-027-W		01/04/00	16:05:00
0001-545-26	B1-028-W		01/04/00	16:07:00
0001-545-27	B1-029-W		01/04/00	16:10:00
0001-545-28	B1-031-W		01/04/00	16:15:00
0001-545-29	B1-032-W		01/04/00	16:17:00
. 0001-545-30	B1-033-W		01/04/00	16:20:00
0001-545-31	B1-034-W		01/04/00	16:22:00
0001-545-32	B1-035-W		01/04/00	16:25:00
0001-545-33	B1-036-W		01/04/00	16:27:00
0001-545-34	B1-037-W		01/04/00	16:30:00
0001-545-35	B1-038-W		01/04/00	16:32:00
0001-545-36	B1-039-W		01/04/00	16:35:00



REPORTED DATE: February 08, 2000

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PBSJ Sample No.	Client Sample ID	Locator	Collection of	late/time
0001-545-37	B1-040-W		01/04/00	16:40:00
0001-545-38	B1-MR4-001-F		01/04/00	16:57:00
0001-545-39	B1-MR4-002-W		01/04/00	17:00:00
0001-545-40	B1-MR4-003-LF		01/ 04/0 0	17:02:00
0001-545-41	B1-044-LF		01/04/00	17:12:00
0001-545-42	B1-045-LF		01/04/00	17:15:00
0001-545-43	B1-046-LF		01/04/00	17:17:00
0001-545-44	B1-048-LF		01/04/00	17:20:00
0001-545-45	B1-049-LF		01/04/00	17:22:00
	B1-050-LF		01/04/00	17:25:00
0001-545-47	B1-051-LF		01/04/00	17:27:00
0001-545-48	B1-052-LF		01/04/00	17:30:00
0001-545-49	B1-053-LF		01/04/00	17:32:00
0001-545-50	FB-1/4/00		01/04/00	18:00:00
0001-545-51	B1-047-W		01/04/00	00:00:00

Thank you for using PBS&J Analytical Services

T. French

PBS&J Project Manager

Reported: February 08, 2000 02:00 PM

Page 1 of 9 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

> 600 University Street, Suite 800 Seattle, WA 98101 (206)587-4648 FAX 624-3679

PBS&J Project Manager: T.French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0001-545-1	Client ID B1-001-FL		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ana	alyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00	M
beryllium		.0001	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-545-2	Client ID B1-002-FL		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected	***
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ana	alyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00)M
beryllium		.001	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-545-3	Client ID B1-003-FL		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ana	lyst
Metals in Swipe	by ICAP	•		NIOSH	7300		01/06/00	01/06/00 D)M
beryllium		.0004	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-545-4	Client ID B1-004-FL		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ana	lyst
Metals in Swipe	by ICAP		.•	NIOSH	7300		01/06/00	01/06/00 D)M
beryllium		.0012	mg/ft^2			.00003	5		
PBS&J Sample No. 0001-545-5	Client ID B1-005-FL		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ana	lyst
Metals in Swipe	by ICAP	_		NIOSH	7300		01/06/00	01/06/00 D	M
beryllium		.0002	mg/ft^2			.00005	5		•

Reported: February 08, 2000 02:00 PM

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PBS&J Sample No. 0001-545-6	Client ID B1-006-FL		Date Received 01/05/00	Site			Date & 01/04/0	Time Collecte	d
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ar	nalyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00	DM
beryllium		.00098	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-545-7	Client ID B1-007-FL		Date Received 01/05/00	Site			Date & 01/04/0	Time Collecte	d
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ar	nalyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00	DM
beryllium		.00049	mg/ft^2			.0000	5 ·		
PBS&J Sample No. 0001-545-8	Client ID B1-008-FL		Date Received 01/05/00	Site			Date & 01/04/0	Time Collecte	d
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ar	nalyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00	DM
beryllium		.00024	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-545-9	Client ID B1-009-FL		Date Received 01/05/00	Site			Date & 01/04/0	Time Collecte	d
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed An	alyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00	DM
beryllium		.0034	mg/ft^2			.0000	ō		
PBS&J Sample No. 0001-545-10	Client ID B1-010-FL		Date Received 01/05/00	Site			Date & 01/04/0	Time Collecte 0 15:22:00	d
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed An	alyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00	DM
beryllium		00088	mg/ft^2			.00009	5		
PBS&J Sample No. 0001-545-11	Client ID B1-011-FL		Date Received 01/05/00	Site			Date & 01/04/0	Time Collecte 0 15:25:00	d
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed An	alyst
Metals in Swipe	by ICAP		·	NIOSH	7300		01/06/00	01/06/00	DM
beryllium		.002	mg/ft^2			.00009	5		
PBS&J Sample No. 0001-545-12	Client ID B1-012-FL		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected	ď
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed An	alyst

Reported: February 08, 2000 02:00 PM

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PBS&J Sample No. 0001-545-12	Client ID B1-012-FL		Date Received 01/05/00	Site		Date & 01/04/	Time Collected
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH 7:	300	01/06/00	01/06/00 DM
beryllium		.0053	mg/ft^2		.0000)5	
PBS&J Sample No. 0001-545-13	Client ID B1-013-FL		Date Received 01/05/00	Site		Date & 01/04/	Time Collected
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH 7:	300	01/06/00	01/06/00 DM
beryllium		.0036	mg/ft^2		.0000)5	
PBS&J Sample No. 0001-545-14	Client ID B1-014-FL		Date Received 01/05/00	Site		Date & 01/04/	Time Collected 00 15:32:00
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH 7:	300	01/06/00	01/06/00 DM
beryllium		.0017	mg/ft^2		.0000)5	
PBS&J Sample No. 0001-545-15	Client ID B1-015-FL		Date Received 01/05/00	Site		Date & 01/04/0	Time Collected 00 15:35:00
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH 73	300	01/06/00	01/06/00 DM
beryllium		.0021	mg/ft^2		.0000)5	
PBS&J Sample No. 0001-545-16	Client ID B1-016-FL		Date Received 01/05/00	Site		Date & 01/04/0	Time Collected 00 15:37:00
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH 73	300	01/06/00	01/06/00 DM
beryllium		.0009	mg/ft^2		.0000)5	
PBS&J Sample No. 0001-545-17	Client ID B1-017-FL		Date Received 01/05/00	Site		Date & 01/04/0	Time Collected 00 15:40:00
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP		-	NIOSH 73	300	01/06/00	01/06/00 DM
beryllium		.0005	mg/ft^2		.0000)5	
PBS&J Sample No. 0001-545-18	Client ID B1-018-FL		Date Received 01/05/00	Site		Date & 01/04/0	Time Collected 00 15:45:00
Parameter		Results	Qual Units	Method	MDL	Prepdate	Analyzed Ana:

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PBS&J Sample No. 0001-545-18	Client ID B1-018-FL		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected 00 15:45:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analys
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00 DM
beryllium		.00039	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-545-19	Client ID B1-019-W		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analys
Metals in Swipe	by ICAP			NIOSH	7300	•	01/06/00	01/06/00 DM
beryllium		.001	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-545-20	Client ID B1-020-W		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected 00 15:47:00
Parameter		Results	Qual Units	Method	***************************************	MDL	Prepdate	Analyzed Analys
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00 DM
beryllium		.0002	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-545-21	Client ID B1-021-W		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected 00 15:50:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analys
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00 DM
beryllium		.0003	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-545-22	Client ID B1-023-W		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected 0 15:55:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analys
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00 DM
beryllium		.01	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-545-23	Client ID B1-024-W		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected 0 15:57:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analys
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00 DM
beryllium	•	.016	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-545-24	Client ID B1-026-W		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected 0 16:02:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analys

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PBS&J Sample No. 0001-545-24	Client ID B1-026-W		Date Received 01/05/00	Site	!		Date & 01/04/	Time Collec 00 16:02:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00	DM
beryllium		.0002	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-545-25	Client ID B1-027-W		Date Received 01/05/00	Site			Date & 01/04/6	Time Collect 00 16:05:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00	DM
beryllium		.003	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-545-26	Client ID B1-028-W		Date Received 01/05/00	Site			Date & 01/04/0	Time Collect 00 16:07:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP		11.	NIOSH	7300		01/06/00	01/06/00	DM
beryllium		.00155	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-545-27	Client ID B1-029-W		Date Received 01/05/00	Site			Date & 01/04/0	Time Collect 00 16:10:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00	DM
beryllium		.009	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-545-28	Client ID B1-031-W		Date Received 01/05/00	Site			Date & 01/04/0	Time Collect 0 16:15:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Anaiyst
Metals in Swipe	by ICAP			NIOSH	7300	, , ,	01/06/00	01/06/00	DM
beryllium		.0002	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-545-29	Client ID B1-032-W		Date Received 01/05/00	Site			Date & 01/04/0	Time Collect 00 16:17:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00	DM
beryllium		.0002	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-545-30	Client ID B1-033-W		Date Received 01/05/00	Site			Date & 01/04/0	Time Collect 0 16:20:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Ana [']

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Parameter

Client ID Site **Date & Time Collected Date Received** PBS&J Sample No. 01/04/00 B1-033-W 16:20:00 0001-545-30 01/05/00 Analyzed Analyst Results Qual Units Method MDL Prepdate Parameter NIOSH 7300 01/06/00 Metals in Swipe by ICAP 01/06/00 DM mg/ft^2 .00005 .00016 beryllium **Date & Time Collected** Client ID **Date Received** Site PBS&J Sample No. 01/04/00 16:22:00 B1-034-W 0001-545-31 01/05/00 Results Qual Units Method MDL Prepdate Analyzed Analyst Parameter Metals in Swipe by ICAP NIOSH 7300 01/06/00 01/06/00 DM .00005 bervllium .0002 mg/ft^2 **Date & Time Collected** PBS&J Sample No. Client ID **Date Received** Site 0001-545-32 B1-035-W 01/05/00 01/04/00 16:25:00 Method MDL Prepdate Analyzed Analyst Results Qual Units Parameter Metals in Swipe by ICAP NIOSH 7300 01/06/00 01/06/00 beryllium .00005 .0031 mg/ft^2 Site **Date & Time Collected** PBS&J Sample No. Client ID **Date Received** B1-036-W 0001-545-33 01/05/00 01/04/00 16:27:00 Results Qual Units Method MDL Analyzed Analyst Prepdate Parameter Metals in Swipe by ICAP NIOSH 7300 01/06/00 01/06/00 DM beryllium mg/ft^2 .00005 .00009 **Date & Time Collected** Site Client ID PBS&J Sample No. **Date Received** B1-037-W 01/04/00 16:30:00 0001-545-34 01/05/00 Method MDL Analyzed Analyst Results Qual Units Prepdate **Parameter** Metals in Swipe by ICAP NIOSH 7300 01/06/00 01/06/00 mg/ft^2 .00005 beryllium .00009 **Date & Time Collected** Client ID Site PBS&J Sample No. **Date Received** B1-038-W 16:32:00 0001-545-35 01/05/00 01/04/00 Results Qual Units Method MDL Prepdate Analyzed Analyst **Parameter** Metals in Swipe by ICAP NIOSH 7300 01/06/00 01/06/00 DM beryllium .00008 mq/ft^2 .00005 **Date & Time Collected** PBS&J Sample No. Client ID Site **Date Received** 0001-545-36 B1-039-W 01/04/00 16:35:00 01/05/00

Results

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PBS&J Sample No. 0001-545-36	Client ID B1-039-W		_	ate Received /05/00	Site			Date & 01/04/0	Time Collec 00 16:35:00	
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP				NIOSH	7300		01/06/00	01/06/00	DM
beryllium		00005	Ü	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-545-37	Client ID B1-040-W		_	ate Received /05/00	Site			Date & 01/04/0	Time Collec 00 16:40:00	
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP				NIOSH	7300	•	01/06/00	01/06/00	DM
beryllium		.0006		mg/ft^2			.0000	5		
PBS&J Sample No. 0001-545-38	Client ID B1-MR4-001-F			ate Received /05/00	Site			Date & 01/04/0	Time Collec 00 16:57:00	
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP				NIOSH	7300		01/06/00	01/06/00	DM
beryllium		.018		mg/ft^2			.00005	5		
PBS&J Sample No. 0001-545-39	Client ID B1-MR4-002-V	V		ate Received /05/00	Site			Date & 01/04/0	Time Collec 00 17:00:00	
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP				NIOSH	7300	(6)	01/06/00	01/06/00	DM
beryllium		.0014		mg/ft^2			.00005	5		
PBS&J Sample No. 0001-545-40	Client ID B1-MR4-003-L	F		ate Received /05/00	Site			Date & 01/04/0	Time Collect 00 17:02:00	
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP				NIOSH	7300		01/06/00	01/06/00	DM
beryllium		.061		mg/ft^2			.00005			
PBS&J Sample No. 0001-545-41	Client ID B1-044-LF			ate Received /05/00	Site			Date & 01/04/0	Time Collect 0 17:12:00	
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed A	Analyst
Metals in Swipe	by ICAP				NIOSH	7300		01/06/00	01/06/00	DM
beryllium		.0019		mg/ft^2			.00005	ò		
PBS&J Sample No. 0001-545-42	Client ID B1-045-LF			ate Received /05/00	Site			Date & 01/04/0	Time Collect 0 17:15:00	
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed A	Anal

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PBS&J Sample No. 0001-545-42	Client ID B1-045-LF		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected 00 17:15:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP	· · · · · · · · · · · · · · · · · · ·		NIOSH .	7300		01/06/00	01/06/00 DM
beryllium		.008	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-545-43	Client ID B1-046-LF		Date Received 01/05/00	Site			Date & 01/04/6	Time Collected
Parameter		Results	Qual Units	Method	-	MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH '	7300		01/06/00	01/06/00 DM
beryllium		.001	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-545-44	Client ID B1-048-LF		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected 00 17:20:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00 DM
beryllium		.0018	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-545-45	Client ID B1-049-LF		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected 00 17:22:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00 DM
beryllium		.0013	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-545-46	Client ID B1-050-LF		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected 00 17:25:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00 DM
beryllium		.0025	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-545-47	Client ID B1-051-LF		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected 0 17:27:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/06/00	01/06/00 DM
beryllium		.0032	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-545-48	Client ID B1-052-LF		Date Received 01/05/00	Site			Date & 01/04/0	Time Collected 00 17:30:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst

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PBS&J Sample No. 0001-545-48	Client ID B1-052-LF			ate Received /05/00	Site			Date & 01/04/0	Time Collected 00 17:30:00
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP				NIOSH	7300		01/06/00	01/06/00 DM
beryllium		.00061		mg/ft^2			.00005	5	
PBS&J Sample No. 0001-545-49	Client ID B1-053-LF			ate Received /05/00	Site			Date & 01/04/0	Time Collected 00 17:32:00
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP				NIOSH	7300		01/06/00	01/06/00 DM
beryllium		.00096		mg/ft^2			.00005	5	
PBS&J Sample No. 0001-545-50	Client ID FB-1/4/00			ate Received /05/00	Site			Date & 01/04/0	Time Collected 00 18:00:00
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP				NIOSH	7300		01/06/00	01/06/00 DM
beryllium		.00005	U	mg/ft^2			.00005		
PBS&J Sample No. 0001-545-51	Client ID B1-047-W			ate Received /05/00	Site	,		Date & 01/04/0	Time Collected
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP				NIOSH	7300		01/06/00	01/06/00 DM
beryllium		.0019		mg/ft^2			.00005	•	

TETRA TECH, INC.
15400 NE 90th, Suite 100
Redmond, Washington 98052
(206) 883-1912

CHAIN OF CUSTODY

DOCUMENT	

(206) 883-1912 FAX (206) 881-6997	FAX (206) 881-6997 NOC Facility Sa gusta FL																				
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	TETRA TECH, INC.
Co.	5400 NE 90th, Suite 100
	Redmond, Washington 98052
	(206) 883-1912
	FAX (206) 881-6997

CHAIN OF CUSTODY 001-545 DOCUMENT

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	TETRA TECH, INC.
	15400 NE 90th, Suite 100
	Redmond, Washington 98052
املا و ا	(206) 883-1912
ı —,	EAV (000) 004 0007

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	TTRA TECH, INC.
	5400 NE 90th, Suite 100
	Redmond, Washington 98052
	(206) 883-1912
(-,	EAV (000) 004 0007

CHAIN OF CUSTODY

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REPORTED DATE: February 08, 2000

Page: 1 of 2 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: ABC FACILITY

RECEIVED DATE: 11-JAN-00

PO#:

PBS&J Login Number: 0001-540

PBSJ Sample No.	Client Sample ID	Locator	Collection date/time
0001-540-01	BI-054-LF		01/08/00 13:00:00
∩001-540-02	BI-055-LF		01/08/00 13:05:00
0001-540-03	BI-056-LF		01/08/00 13:10:00
0001-540-04	Bł-057-LF		01/08/00 13:15:00
0001-540-05	BI-058-LF		01/08/00 13:20:00
0001-540-06	BI-059-LF		01/08/00 13:25:00
0001-540-07	BI-060-LF		01/08/00 13:30:00
0001-540-08	BI-061-LF		01/08/00 13:35:00
0001-540-09	BI-LR-004-LF		01/08/00 13:45:00
0001-540-10	BI-MRI-004-LF		01/08/00 13:50:00
0001-540-11	Bi-MR4-004-LF		01/08/00 13:55:00



REPORTED DATE: February 08, 2000

Page: 2 of 2 Pages

T.French

PBS&J Project Manager

Reported: February 08, 2000 02:02 PM

Page 1 of 2 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

> 600 University Street, Suite 800 Seattle, WA 98101

(206)587-4648 FAX 624-3679

PBS&J Project Manager: T.French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0001-540-1	Client ID BI-054-LF		Date Received	Site			Date & 01/08/0	Time Collected 00 13:00:00
Parameter		Results	Qual Units	Method	M	DL F	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP	<u>-</u>		NIOSH 7	300	0	1/11/00	01/11/00 DM
beryllium		.00335	mg/ft^2		.0	0005		
3S&J Sample No. J 001-540-2	Client ID BI-055-LF		Date Received	Site			Date & 01/08/0	Time Collected 00 13:05:00
Parameter		Results	Qual Units	Method	M	DL F	repdate	Analyzed Analyst
Metals in Swipe	e by ICAP			NIOSH 7	300	0	1/11/00	01/11/00 DM
beryllium		.00037	mg/ft^2		.0	0005		
PBS&J Sample No. 0001-540-3	Client ID BI-056-LF		Date Received 01/11/00	Site			Date & 01/08/0	Time Collected 0 13:10:00
Parameter		Results	Qual Units	Method	M	DL F	repdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH 7	300	0	1/11/00	01/11/00 DM
beryllium ,		.00005	mg/ft^2		.0	0005		
PBS&J Sample No. 0001-540-4	Client ID BI-057-LF		Date Received 01/11/00	Site			Date & 01/08/0	Time Collected 0 13:15:00
Parameter		Results	Qual Units	Method	MI	DL F	repdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH 7	300	0:	1/11/00	01/11/00 DM
beryllium		.00005	$_{_{ m i}}$ mg/ft^2		.0	0005		
PBS&J Sample No. 0001-540-5	Client ID BI-058-LF		Date Received	Site			Date & 01/08/0	Time Collected 0 13:20:00
Parameter		Results	Qual Units	Method	M	OL F	repdate	Analyzed Analyst
Metals in Swipe	e by ICAP			NIOSH 7	300	0:	1/11/00	01/11/00 DM
beryllium		.00049	mg/ft^2		.0	0005		

Reported: February 08, 2000 02:02 PM

Page 2 of 2 Pages

PBS&J Sample No. 0001-540-6	Client ID BI-059-LF		Date Received 01/11/00	Site	,		Date & 01/08/0	Time Collection 13:25:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP	_	,	NIOSH	7300		01/11/00	01/11/00	DM
beryllium		.00007	mg/ft^2			.00005			
PBS&J Sample No. 0001-540-7	Client ID BI-060-LF		Date Received 01/11/00	Site			Date & 01/08/6	Time Collect 00 13:30:0	
Parameter		Results	Qual Units	Method	·	MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/11/00	01/11/00	DM
beryllium		.00005	mg/ft^2			.00005			
PBS&J Sample No. 0001-540-8	Client ID BI-061-LF		Date Received 01/11/00	Site			Date & 01/08/6	Time Collect 00 13:35:0	
Parameter	-	Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/11/00	01/11/00	DM
beryllium		.00012	mg/ft^2			.00005			
PBS&J Sample No. 0001-540-9	Client ID BI-LR-004-LF		Date Received 01/11/00	Site			Date & 01/08/0	Time Collection 13:45:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/11/00	01/11/00	DM
beryllium		.0062	mg/ft^2			.00005			
PBS&J Sample No. 0001-540-10	Client ID BI-MRI-004-LF		Date Received 01/11/00	Site			Date & 01/08/0	Time Collec 00 13:50:00	
Parameter	· · · · · · · · · · · · · · · · · · ·	Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/11/00	01/11/00	DM
						.00005			
beryllium		.0131	mg/ft^2			.00003			
PBS&J Sample No. 0001-540-11	Client ID BI-MR4-004-LF		mg/ft^2 Date Received 01/11/00	Site		.00003	Date & 01/08/0	Time Collec 00 13:55:00	
PBS&J Sample No.			Date Received	Site Method		MDL			0
PBS&J Sample No. 0001-540-11	BI-MR4-004-LF		Date Received 01/11/00			MDL	01/08/0	00 13:55:00	0

TETRA TECH, INC. 15400 NE 90th, Suite 100 Redmond, Washington 98052 (206) 883-1912 FAX (206) 881-6997

CHAIN OF CUSTODY

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REPORTED DATE: February 08, 2000

Page: 1 of 2 Pages

To: Phil Skorge Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: ABC FACILITY

RECEIVED DATE: 21-JAN-00

PO#:

PBS&J Login Number: 0001-557

PBSJ Sample No.	Client Sample ID	Locator	Collection	date/time
0001-557-01	B2-FL-001		01/13/00	12:25:00
0001-557-02	B2-FL-002		01/13/00	12:30:00
0001-557-03	B2-FL-003		01/13/00	12:35:00
0001-557-04	B2-W-004		01/13/00	12:40:00
0001-557-05	B2-W-005		01/13/00	12:45:00
0001-557-06	B2-W-006		01/13/00	12:50:00
0001-557-07	B2-W-007		01/13/00	12:55:00
0001-557-08	B2-W-008		01/13/00	13:00:00
0001-557-09	B2-LF-009		01/13/00	13:05:00
0001-557-10	B2-LF-010		01/13/00	13:10:00
0001-557-11	B2-LF-011		01/13/00	13:15:00
0001-557-12	B2-LF-012		01/13/00	13:20:00
0001-557-13	B2-LF-013		01/13/00	13:25:00
0001-557-14	B2-LF-014		01/13/00	13:30:00



REPORTED DATE: February 08, 2000

Page: 2 of 2 Pages

PBSJ Sample No.	Client Sample ID	Locator	Collection date/ti				
0001-557-15	B2-FL-015		01/13/00	13:35:00			
0001-557-16	B2-FL-016		01/13/00	13:40:00			
0001-557-17	B2-W-017		01/13/00	13:45:00			
0001-557-18	B2-W-018		01/13/00	13:50:00			
0001-557-19	B2-LF-019		01/13/00	13:55:00			
0001-557-20	B2-LF-020	•	01/13/00	14:00:00			
0001-557-21	В2/ТВ		01/13/00	00:00:00			
0001-557-22	B2-LF-021		01/13/00	00:00:00			

Thank you for uşing PBS& Analytical Services

T.French

PBS&J Project Manager

Reported: February 08, 2000 02:03 PM

Page 1 of 4 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

> 600 University Street, Suite 800 Seattle, WA 98101

(206)587-4648 FAX 624-3679

PBS&J Project Manager: T.French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0001-557-1	Client ID B2-FL-001	Date Received Site 01/21/00					Date & Time Collected 01/13/00 12:25:00			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst		
Metals in Swipe	e by ICAP			NIOSH	7300	· ·	01/14/00	01/14/00 DM		
beryllium		.00038	mg/ft^2			.0000	5			
BS&J Sample No. 0001-557-2	Client ID B2-FL-002	Date Received Site 01/21/00					Date & Time Collected 01/13/00 12:30:00			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst		
Metals in Swipe	∍ by ICAP			NIOSH	7300		01/14/00	01/14/00 DM		
beryllium		.00005	U mg/ft^2			.0000	5			
PBS&J Sample No. 0001-557-3	Client ID B2-FL-003		Date Received 01/21/00	Site			Date & 01/13/0	Time Collected 00 12:35:00		
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst		
Metals in Swipe	by ICAP			NIOSH	7300		01/14/00	01/14/00 DM		
beryllium		.00026	mg/ft^2			.0000	5			
PBS&J Sample No. 0001-557-4	Client ID B2-W-004		Date Received 01/21/00	Site			Date & 01/13/0	Time Collected 00 12:40:00		
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst		
Metals in Swipe	by ICAP	• "	· .	NIOSH	7300		01/14/00	01/14/00 DM		
beryllium		.00007	mg/ft^2			.0000	5			
PBS&J Sample No. 0001-557-5	Client ID B2-W-005	Date Received Site Date & Time Collected 01/21/00 01/13/00 12:45:00								
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst		
Metals in Swipe	by ICAP			NIOSH	7300		01/14/00	01/14/00 DM		
beryllium		.00005	U mg/ft^2			.00005	5			

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Page 2 of 4 Pages

PBS&J Sample No. 0001-557-6	Client ID B2-W-006			ate Received /21/00	Site	ı		Date & Time Collected 01/13/00 12:50:00			
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst	
Metals in Swipe	by ICAP				NIOŚH	7300		01/14/00	01/14/00	DM	
beryllium		.00005	U	mg/ft^2			.0000	5			
PBS&J Sample No. 0001-557-7	Client ID B2-W-007			ate Received /21/00	Site			Date & 01/13/0	Time Collect 00 12:55:0		
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst	
Metals in Swipe	by ICAP				NIOSH	7300		01/14/00	01/14/00	DM	
beryllium		.00005	U	mg/ft^2			.0000	5			
PBS&J Sample No. 0001-557-8	Client ID B2-W-008			ate Received /21/00	Site			Date & 01/13/0	Time Collect 00 13:00:0		
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst	
Metals in Swipe	by ICAP			•	NIOSH	7300		01/14/00	01/14/00	DM	
beryllium		.00005	U	mg/ft^2			.00009	5			
PBS&J Sample No. 0001-557-9	Client ID B2-LF-009			ate Received /21/00	Site			Date & 01/13/0	Time Collection 13:05:0		
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst	
Metals in Swipe	by ICAP				NIOSH	7300		01/14/00	01/14/00	DM	
beryllium		.0005		mg/ft^2			.00005	5			
PBS&J Sample No. 0001-557-10	Client ID B2-LF-010			ate Received /21/00	Site			Date & 01/13/0	Time Collection 13:10:00		
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst	
Metals in Swipe	by ICAP				NIOSH	7300		01/14/00	01/14/00	DM	
beryllium		.00008		mg/ft^2			.00005	5			
PBS&J Sample No. 0001-557-11	Client ID B2-LF-011			ate Received /21/00	Site			Date & 01/13/0	Time Collec 0 13:15:00		
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst	
Metals in Swipe	by ICAP		•		NIOSH	7300		01/14/00	01/14/00	DM	
beryllium		.00007		mg/ft^2			.00005	5			
PBS&J Sample No. 0001-557-12	Client ID B2-LF-012			ate Received /21/00	Site			Date & 01/13/0	Time Collec 0 13:20:00		
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Anal	

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Page 3 of 4 Pages

PBS&J Sample No. 0001-557-12	Client ID B2-LF-012		Date Received	ł Site	•		Date & 01/13/0	Time Collected 00 13:20:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/14/00	01/14/00 DM
beryllium		.00026	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-557-13	Client ID B2-LF-013		Date Received	j Site			Date & 01/13/6	Time Collected 00 13:25:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/14/00	01/14/00 DM
beryllium		.00012	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-557-14	Client ID B2-LF-014		Date Received 01/21/00	Site			Date & 01/13/0	Time Collected 00 13:30:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/14/00	01/14/00 DM
beryllium		.00053	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-557-15	Client ID B2-FL-015		Date Received 01/21/00	! Site			Date & 01/13/0	Time Collected 00 13:35:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/14/00	01/14/00 DM
beryllium		.0051	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-557-16	Client ID B2-FL-016		Date Received 01/21/00	Site			Date & 01/13/0	Time Collected 00 13:40:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/14/00	01/14/00 DM
beryllium		.00007	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-557-17	Client ID B2-W-017		Date Received	Site			Date & 01/13/0	Time Collected 00 13:45:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP		•	NIOSH	7300		01/14/00	01/14/00 DM
beryllium		.00009	mg/ft^2			.00005	ō	
PBS&J Sample No. 0001-557-18	Client ID B2-W-018		Date Received 01/21/00	Site			Date & 01/13/0	Time Collected 0 13:50:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst

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Page 4 of 4 Pages

PBS&J Sample No. 0001-557-18	Client ID B2-W-018		Date Received 01/21/00	Site			Date & 01/13/0	Time Collection 13:50:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	e by ICAP			NIOSH	7300		01/14/00	01/14/00	DM
beryllium		.0001	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-557-19	Client ID B2-LF-019		Date Received 01/21/00	Site			Date & 01/13/0	Time Collect 00 13:55:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	e by ICAP			NIOSH	7300		01/14/00	01/14/00	DM
beryllium		.00033	mg/ft^2			.00005	5		
PBS&J Sample No. 0001-557-20	Client ID B2-LF-020		Date Received 01/21/00	Site			Date & 01/13/0	Time Collect 00 14:00:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/14/00	01/14/00	DM
beryllium		.0002	mg/ft^2			.00005	5		
PBS&J Sample No. 0001-557-21	Client ID B2/TB		Date Received 01/21/00	Site			Date & 01/13/0	Time Collect 00 00:00:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/14/00	01/14/00	DM
beryllium		.00007	mg/ft^2			.00005	5		
PBS&J Sample No. 0001-557-22	Client ID B2-LF-021		Date Received 01/21/00	Site			Date & 01/13/0	Time Collection 00:00:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP		·	NIOSH	7300		01/14/00	01/14/00	DM
beryllium		.00034	mg/ft^2			.00005	5		

	TETRA TECH, INC.
	15400 NE 90th, Suite 100
 	Redmond, Washington 98052
اما 🗷 📗	(206) 883-1912
(-)	FAX (206) 881-6997

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	AA TECH, INC.
	15400 NE 90th, Suite 100
	Redmond, Washington 98052
	(206) 883-1912
·/	EAY (206) 881-6007

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REPORTED DATE: February 08, 2000

Page: 1 of 1 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: ABC FACILITY

RECEIVED DATE: 21-JAN-00

PO#:

PBS&J Login Number: 0001-558

PBSJ Sample No.	Client Sample ID	Locator	Collection of	late/time
0001-558-01	PA/FL/001		01/18/00	15:00:00
∩001-558-02 .	PA/CEIL/002		01/18/00	15:05:00
0001-558-03	PA/W/003		01/18/00	15:10:00
0001-558-04	B2/W/026R		01/18/00	15:20:00
0001-558-05	B2/FL/046R		01/18/00	15:30:00
0001-558-06	DUCT		01/18/00	15:40:00
0001-558-07	ТВ		01/18/00	00:00:00

Thank you for using PBS&J Analytical Services

T.French

PBS&J Project Manager

Reported: February 08, 2000 02:04 PM

Page 1 of 2 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

> 600 University Street, Suite 800 Seattle, WA 98101

(206)587-4648 FAX 624-3679

PBS&J Project Manager: T.French

Client ID

PBS&J Sample No.

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0001-558-1	Client ID PA/FL/001			ate Received //21/00	Site	•		Date & 01/18/6	Time Collection 15:00:0	
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP				NIOSH	7300		01/19/00	01/19/00	DM
beryllium		.00005	U	mg/ft^2			.0000	5		
chromium		.00005	U	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-558-2	Client ID PA/CEIL/002		_	ate Received /21/00	Site			Date & 01/18/0	Time Collect 00 15:05:0	
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP				NIOSH	7300		01/19/00	01/19/00	DM
beryllium		.0017		mg/ft^2			.0000!	5		
chromium		.013		mg/ft^2			.0000	5		
PBS&J Sample No. 0001-558-3	Client ID PA/W/003		_	ate Received /21/00	Site			Date & 01/18/0	Time Collect 0 15:10:0	
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			,	NIOSH	7300		01/19/00	01/19/00	DM
beryllium		.0002		mg/ft^2			.0000	5		
chromium		.0003		mg/ft^2			.0000	5		
PBS&J Sample No. 0001-558-4	Client ID B2/W/026R			ate Received /21/00	Site			Date & 01/18/0	Time Collect 0 15:20:0	
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP				NIOSH	7300		01/19/00	01/19/00	DM
beryllium		.00005	U	mg/ft^2			.00003	5		
chromium		.00005	Ū	mg/ft^2			.00005	ō		

Reported: February 08, 2000 02:04 PM

Page 2 of 2 Pages

PBS&J Sample No. 0001-558-5	Client ID B2/FL/046R		_	ate Received 1/21/00	Site	•		Date & 01/18/0	Time Collected 00 15:30:00
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	e by ICAP	•			NIOSH	7300		01/19/00	01/19/00 DM
beryllium		.0018		mg/ft^2			.0000	5	
chromium		.00005	Ū	mg/ft^2			.0000	5	
PBS&J Sample No. 0001-558-6	Client ID DUCT		_	ate Received /21/00	Site			Date & 01/18/0	Time Collected 00 15:40:00
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP				NIOSH	7300		01/19/00	01/19/00 DM
beryllium		.013		mg/ft^2			.0000	ō	
chromium		.13		mg/ft^2			.0000	5	
PBS&J Sample No. 0001-558-7	Client ID TB			ate Received /21/00	Site			Date & 01/18/0	Time Collected 00 00:00:00
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP				NIOSH	7300		01/19/00	01/19/00 DM
beryllium		.00005	U	mg/ft^2			.00003	5	
chromium		.00005	U	mg/ft^2			.00005	5	

RA TECH, INC.
15400 NE 90th, Suite 100
Redmond, Washington 98052
(206) 883-1912
FAY (206) 881-6007

CHAIN OF CUSTODY

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PATEGIL 1602	1505	1							1	1										PLATING AREA CEILING
PALWIND	1510								1	7										ASTING AREA WALL
BUNDONE	1520 1530								1	V										BLOG 2 RESIDERATE
BZ/FC/046R2 DUCT	1530			ζ.)	V										BLOG 2 RESEMPLE
Duct'	1540								1		1									PLATING DUCTWOOK.
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REPORTED DATE: February 08, 2000

Page: 1 of 3 Pages

To: Phil Skorge Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: ABC FACILITÝ

RECEIVED DATE: 21-JAN-00

PO#:

PBS&J Login Number: 0001-560

PBSJ Sample No.	Client Sample ID	Locator	Collection	date/time
0001-560-01	B2-FL-041	A	01/14/00	12:05:00
0001-560-02	B2-FL-042		01/14/00	12:10:00
0001-560-03	B2-FL-043		01/14/00	12:15:00
0001-560-04	B2-FL-044		01/14/00	12:20:00
0001-560-05	B2-FL-045		01/14/00	12:25:00
0001-560-06	B2-FL-046		01/14/00	12:30:00
0001-560-07	B2-FL-047		01/14/00	12:35:00
0001-560-08	B2-FL-048		01/14/00	12:40:00
0001-560-09	B2-FL-049		01/14/00	12:45:00
0001-560-10	MR2-FL-01		01/14/00	12:50:00
0001-560-11	MR2-W-02	* »	01/14/00	12:55:00
0001-560-12	MR2-LF-03		01/14/00	13:00:00
0001-560-13	MR3-FL-01		01/14/00	13:05:00
0001-560-14	MR3-W-02		01/14/00	13:10:00



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PBSJ Sample No.	Client Sample ID	Locator	Collection	date/time
0001-560-15	MR3-LF-03	SECURIOR VICE VICES AND A P. C. C.	01/14/00	13:15:00
0001-560-16	B2-LF-050		01/14/00	13:20:00
0001-560-17	B2-LF-051	4	01/14/00	13:25:00
0001-560-18	B2-LF-052		01/14/00	13:30:00
0001-560-19	B2-LF-053		01/14/00	13:35:00
0001-560-20	B2-W-022		01/14/00	10:30:00
0001-560-21	B2-W-023		01/14/00	10:35:00
0001-560-22	B2-W-024		01/14/00	10:40:00
0001-560-23	B2-W-025		01/14/00	10:45:00
0001-560-24	B2-W-026		01/14/00	10:50:00
0001-560-25	B2-W-027		01/14/00	10:55:00
0001-560-26	B2-W-028		01/14/00	11:00:00
0001-560-27	B2-W-029		01/14/00	11:05:00
0001-560-28	B2-W-030		01/14/00	11:10:00
0001-560-29	B2-W-031		01/14/00	11:15:00
0001-560-30	B2-W-032		01/14/00	11:20:00
0001-560-31	B2-W-033		01/14/00	11:25:00
0001-560-32	B2-W-034		01/14/00	11:30:00
0001-560-33	B2-W-035		01/14/00	11:35:00
0001-560-34	B2-W-036		01/14/00	11:40:00
0001-560-35	B2-W-037		01/14/00	11:45:00
0001-560-36	B2-W-040		01/14/00	12:00:00



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PBSJ Sample No.	Client Sample ID	Locator	Collection	iate/time
0001-560-37	B2-LF-054		01/14/00	13:40:00
0001-560-38	B2-LF-055		01/14/00	13:45:00
0001-560-39	B2-LF-056		01/14/00	13:50:00
0001-560-40	B2-LF-057		01/14/00	13:55:00
0001-560-41	B2-LF-058		01/14/00	14:00:00
0001-560-42	B2-LF-060		01/14/00	14:05:00
0001-560-43	B2-LF-061		01/14/00	14:10:00
0001-560-44	B2-LF-059		01/14/00	14:15:00
0001-560-45	тв		01/14/00	14:28:00

Thank you for using PBS&J Analytical Services

T.French

PBS&J Project Manager

Reported: February 08, 2000 02:05 PM

Page 1 of 8 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

> 600 University Street, Suite 800 Seattle, WA 98101 (206)587-4648 FAX 624-3679

PBS&J Project Manager: T.French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0001-560-1	Client ID B2-FL-041		Date Received 01/21/00	Site			Date & 01/14/0	Time Collect 00 12:05:0	
Parameter		Results	Qual Units	Method	٨	IDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH 7	300		01/17/00	01/17/00	DM
beryllium		.0016	mg/ft^2		. 1	0000	5		
PBS&J Sample No. 0001-560-2	Client ID B2-FL-042		Date Received 01/21/00	Site			Date & 01/14/0	Time Collec 00 12:10:0	
Parameter		Results	Qual Units	Method	٨	IDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH 7	300		01/17/00	01/17/00	DM
beryllium		.00066	mg/ft^2		. (0000	5		
PBS&J Sample No. 0001-560-3	Client ID B2-FL-043		Date Received 01/21/00	Site			Date & 01/14/0	Time Collect 0 12:15:0	
Parameter		Results	Qual Units	Method	N	IDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH 73	300		01/17/00	01/17/00	DM
beryllium		.00043	mg/ft^2		. (00005	5		
PBS&J Sample No. 0001-560-4	Client ID B2-FL-044		Date Received 01/21/00	Site			Date & 01/14/0	Time Collect 0 12:20:0	
Parameter		Results	Qual Units	Method	N	IDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP		.^	NIOSH 7	300		01/17/00	01/17/00	DM
beryllium		.0012	.mg/ft^2		. (00005	5		
PBS&J Sample No. 0001-560-5	Client ID B2-FL-045		Date Received 01/21/00	Site			Date & 01/14/0	Time Collect 0 12:25:0	
Parameter		Results	Qual Units	Method	N	IDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH 73	300		01/17/00	01/17/00	DI
beryllium		.00045	mg/ft^2		. (00005	5		. *

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01/14/00

01/14/00

Prepdate

01/17/00

Prepdate

12:55:00

13:00:00

Analyzed Analyst

01/17/00

Date & Time Collected

Analyzed Analyst

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0001-560-11

0001-560-12

Parameter

Parameter

beryllium

PBS&J Sample No.

Metals in Swipe by ICAP

MR2-W-02

Client ID

MR2-LF-03

Date & Time Collected Site Client ID **Date Received** PBS&J Sample No. 12:30:00 B2-FL-046 01/21/00 01/14/00 0001-560-6 Prepdate Analyzed Analyst Results Qual Units Method MDL Parameter NIOSH 7300 01/17/00 01/17/00 DM Metals in Swipe by ICAP .00005 bervllium .029 mg/ft^2 **Date & Time Collected** Client ID Site PBS&J Sample No. **Date Received** B2-FL-047 01/14/00 12:35:00 0001-560-7 01/21/00 Results Qual Units Method MDL Prepdate Analyzed Analyst **Parameter** Metals in Swipe by ICAP NIOSH 7300 01/17/00 01/17/00 DM .013 mg/ft^2 .00005 beryllium Client ID Site **Date & Time Collected** PBS&J Sample No. **Date Received** B2-FL-048 01/14/00 12:40:00 0001-560-8 01/21/00 Qual Units Analyzed Analyst Parameter Results Method MDL Prepdate Metals in Swipe by ICAP NIOSH 7300 01/17/00 01/17/00 DM .00034 mq/ft^2 .00005 beryllium Client ID Site **Date & Time Collected** PBS&J Sample No. **Date Received** B2-FL-049 01/14/00 12:45:00 0001-560-9 01/21/00 Method MDL Analyzed Analyst Results Qual Units Prepdate **Parameter** Metals in Swipe by ICAP NIOSH 7300 01/17/00 01/17/00 DM beryllium .0014 mg/ft^2 .00005 **Date & Time Collected** PBS&J Sample No. Client ID **Date Received** Site 0001-560-10 MR2-FL-01 01/21/00 01/14/00 12:50:00 Analyzed Analyst Results **Qual Units** Method MDL Prepdate **Parameter** Metals in Swipe by ICAP 01/17/00 DM NIOSH 7300 01/17/00 beryllium .00038 mg/ft^2 .00005 Site **Date & Time Collected** Client ID PBS&J Sample No. **Date Received**

01/21/00

01/21/00

Qual Units

mg/ft^2

Date Received

Method

NIOSH 7300

Site

Method

MDL

.00005

MDL

Qual Units

Results

.000068

Results

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PBS&J Sample No. 0001-560-12	Client ID MR2-LF-03		Date Received	site			Date & 01/14/	Time Collect 00 13:00:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed A	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.00057	mg/ft^2			.0000	15		
PBS&J Sample No. 0001-560-13	Client ID MR3-FL-01		Date Received 01/21/00	l Site			Date & 01/14/	Time Collect 00 13:05:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.0053	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-14	Client ID MR3-W-02		Date Received 01/21/00	l Site			Date & 01/14/0	Time Collect 00 13:10:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.0044	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-15	Client ID MR3-LF-03		Date Received 01/21/00	Site			Date & Time Collected 01/14/00 13:15:00		
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.0059	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-16	Client ID B2-LF-050		Date Received	Site			Date & 01/14/0	Time Collect	ed
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.00005	U mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-17	Client ID B2-LF-051		Date Received 01/21/00	Site			Date & 01/14/0	Time Collecte 0 13:25:00	ed
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed A	nalyst
Metals in Swipe	by ICAP	•	-	NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.00005	U mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-18	Client ID B2-LF-052		Date Received 01/21/00	Site			Date & 01/14/0	Time Collecto 0 13:30:00	ed
Parameter		Results	Qual Units	Method	-	MDL	Prepdate	Analyzed A	nal

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PBS&J Sample No. 0001-560-18	Client ID B2-LF-052		Date Received	Site			Date & 01/14/0	Time Collected	d
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed An	alyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.0001	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-19	Client ID B2-LF-053		Date Received 01/21/00	Site			Date & 01/14/0	Time Collected	d
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed An	alyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.00036	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-20	Client ID B2-W-022		Date Received 01/21/00	Site			Date & 01/14/6	Time Collected	i
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed An	alyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00 I	DM
beryllium		.0045	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-21	Client ID B2-W-023		Date Received 01/21/00	Site			Date & Time Collected 01/14/00 10:35:00		i
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ana	alyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.0023	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-22	Client ID B2-W-024		Date Received 01/21/00	Site			Date & 01/14/0	Time Collected	i
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ana	alyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.0014	mg/ft^2			.0000	5	,	•
PBS&J Sample No. 0001-560-23	Client ID B2-W-025		Date Received 01/21/00	Site			Date & 01/14/0	Time Collected	i
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ana	alyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	OM
beryllium		.001	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-24	Client ID B2-W-026		Date Received 01/21/00	Site			Date & 01/14/0	Time Collected	j
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Ana	alyst

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PBS&J Sample No. 0001-560-24	Client ID B2-W-026		Date Received	. Site			Date & 01/14/0	Time Collec	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.05	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-25	Client ID B2-W-027		Date Received 01/21/00	Site			Date & 01/14/0	Time Collect 00 10:55:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.0004	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-26	Client ID B2-W-028		Date Received 01/21/00	l Site			Date & 01/14/6	Time Collect 00 11:00:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.00029	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-27	Client ID B2-W-029		Date Received 01/21/00	Site			Date & Time Collected 01/14/00 11:05:00		
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.00075	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-28	Client ID B2-W-030		Date Received 01/21/00	Site			Date & 01/14/0	Time Collec 00 11:10:00	
Parameter		Results	Qual Units	Method	***************************************	MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.00023	mg/ft^2			.0000	5		
⁹ BS&J Sample No. 901-560-29	Client ID B2-W-031		Date Received 01/21/00	Site			Date & 01/14/0	Time Collec 00 11:15:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
etals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
ryllium		.00028	mg/ft^2			.0000	5		
J Sample No. 10-30	Client ID B2-W-032		Date Received 01/21/00	Site			Date & 01/14/0	Time Collec 00 11:20:00	
neter		Results	Qual Units	Method	-	MDL	Prepdate	Analyzed	Ane

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PBS&J Sample No. 0001-560-30	Client ID B2-W-032		Date Received 01/21/00	Site			Date & 01/14/0	Time Collected	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analy	
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00 DM	
beryllium		.00026	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-31	Client ID B2-W-033		Date Received 01/21/00	Site			Date & Time Collected 01/14/00 11:25:00		
Parameter		Results	Qual Units	Method	********	MDL	Prepdate	Analyzed Analy	
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00 DM	
beryllium		.00021	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-32	Client ID B2-W-034		Date Received 01/21/00	Site			Date & Time Collected 01/14/00 11:30:00		
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analy	
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00 DM	
beryllium		.00008	4 mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-33	Client ID B2-W-035		Date Received 01/21/00	Site			Date & Time Collected 01/14/00 11:35:00		
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analy	
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00 DM	
beryllium		.00038	mg/ft^2			.0000!	5		
PBS&J Sample No. 0001-560-34	Client ID B2-W-036		Date Received 01/21/00	Site			Date & 01/14/0	Time Collected 0 11:40:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analy	
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00 DM	
beryllium		.0015	mg/ft^2			.0000	ō		
'BS&J Sample No. 101-560-35	Client ID B2-W-037		Date Received 01/21/00	Site			Date & 01/14/0	Time Collected 0 11:45:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analy	
etals in Swipe	by ICAP		-	NIOSH	7300		01/17/00	01/17/00 DM	
ryllium		.00014	mg/ft^2			.0000	5		
l Sample No. ∖0-36	Client ID B2-W-040		Date Received 01/21/00	Site			Date & 01/14/0	Time Collected 0 12:00:00	
neter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analy	

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PBS&J Sample No. 0001-560-36	Client ID B2-W-040		Date Received	Site			Date & 01/14/0	Time Collect 00 12:00:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.00012	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-37	Client ID B2-LF-054		Date Received 01/21/00	Site			Date & 01/14/0	Time Collect 00 13:40:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP		,	NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.00008	6 mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-38	Client ID B2-LF-055		Date Received 01/21/00	Site			Date & Time Collected 01/14/00 13:45:00		
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300	•	01/17/00	01/17/00	DM
beryllium		.00085	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-39	Client ID B2-LF-056		Date Received 01/21/00	Site			Date & Time Collected 01/14/00 13:50:00		
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.00005	U mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-40	Client ID B2-LF-057		Date Received 01/21/00	Site			Date & 01/14/0	Time Collect 0 13:55:0	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00	DM
beryllium		.00005	U mg/ft^2			.0000	5		
BS&J Sample No. 101-560-41	Client ID B2-LF-058		Date Received 01/21/00	Site			Date & Time Collected 01/14/00 14:00:00		
arameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed	Analyst
etals in Swipe	by ICAP	•	•	NIOSH	7300	-	01/17/00	01/17/00	DM
ryllium		.00047	mg/ft^2			.0000	5		
\ Sample No. 0-42	Client ID B2-LF-060		Date Received 01/21/00	Site			Date & Time Collected 01/14/00 14:05:00		

Reported: February 08, 2000 02:05 PM

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PBS&J Sample No. 0001-560-42	Client ID B2-LF-060		Date Received 01/21/00	Site			Date & Time Collected 01/14/00 14:05:00		
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst	
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00 DM	
beryllium		.0001	mg/ft^2		l.	.0000	5		
PBS&J Sample No. 0001-560-43	Client ID B2-LF-061		Date Received 01/21/00	Site			Date & Time Collected 01/14/00 14:10:00		
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst	
Metals in Swipe	by ICAP			NIOSH	7300		01/17/00	01/17/00 DM	
beryllium		.00037	mg/ft^2			.0000	5		
PBS&J Sample No. 0001-560-44	Client ID B2-LF-059		Date Received 01/21/00	Site			Date & Time Collected 01/14/00 14:15:00		
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst	
Metals in Swipe	by ICAP		,	NIOSH	7300		01/17/00	01/17/00 DM	
beryllium		.00077	mg/ft^2			.00005	5		
PBS&J Sample No. 0001-560-45	Client ID TB		Date Received 01/21/00	Site			Date & 01/14/0	Time Collected 00 14:28:00	
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst	
Metals in Swipe	by ICAP	,		NIOSH	7300		01/17/00	01/17/00 DM	
beryllium		.00005	U mg/ft^2			.00005	5		

	TETRA TECH, INC.
	15400 NE 90th, Suite 100
	Redmond, Washington 98052
احا =	(206) 883-1912
	EAV (000) 004 0007

CHAIN OF CUSTODY

PAGH 1 DE 2

FAX (206) 881-6997				ANOR 1	0P3				
PROJECT NAME LOCKHEED		PROJECT NO. 02	NUMBER OF CONTAINERS AMILYSIS		0001-50				
SAMPLERS: (signature)			\[\begin{align*} \begin{align*} \beg						
TI Contact PAIL SKORGE		MEDIA	AMALYSIS		1/01-45				
SAMPLE ID TIME	DATE	0 7 E 44	₩ / % /	/ / / / / / / /					
	i d	Air Surface Water Ground Water Soil Sediment	MUMBER OI		REMARKS				
B2-FL-041 1205	1-14-00								
B2-FL-043 1215					-				
B2-FL-043 1215			1						
1 K2- FL-044 1220			1						
72-FL-045 1235 72-FL-046 1230 72-FL-047 1235			1						
B2-51-046 1230			1						
82-FL-046 1230 82-FL-047 1235			1						
162- FL-048 1/290			1						
B2-FG 049 1245			1						
MR2-FUDI 1250 MR2-FU 1255			1						
MR2-FU 1255			1						
MMK2-M-02 1/255			4						
MR2-LF-03 1300	7		1						
MR3-FL-01 /305 MR3-W-02 /3/5			1						
MR3-FL-01 /305 MR3-W-02 /3/5			1						
MR3-LF-03 1315			1						
182- LF-050 1/520			1						
BZ-LF051 1325 BZ-LF052 1330			1						
BZ-LF052 /330			1						
1335 1335 1335°	1 V I		1						
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RECEIVED BY (signature)	DATE/TIME N	METHOD OF SHIPMENT	AIRBILL NO.	REMARKS RUSH AY HR T.A.T.					

AA TECH, INC. 15400 NE 90th, Suite 100 Redmond, Washington 98052 (206) 883-1912 FAX (206) 881-6997

CHAIN OF CUSTODY

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TI Contact: HILSKOR	Œ						MEDI	A] Ř	A S	$\langle x \rangle$	/ ;	/ /	/ ,	/ /	/ /	/ /	/ /	/		/
SAMPLE ID	TIME	DAT	ΓE					ent	(t)	1 6		3										/
				¥	Surface Water	Ground Water	Soil	Sediment	Swife	NUMBER OF CONTAINERS	M	40/08 40/08										REMARKS
B2-W-022	1030	1-10	4-00								1			1-							亻	
BZ-W-023	1035		i						1	V						1					-	
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B2-W-025	1045							***	V.	N											1	
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B2-W-029	1105								V	1												
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BZ-W-031	1115								V	1												
BZ-W-032 BZ-W-033									1	7												
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RECEIVED BY (signature)		DATE/	TIME	ME	METHOD OF SHIPMENT				AIRBI	LL NO).											

TETRA TECH, INC.
15400 NE 90th, Suite 100
Redmond, Washington 98052
(206) 883-1912
 EAV (906) 001 6007

CHAIN OF CUSTODY

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			THOSO C	<u> </u>
SAMPLERS: (signature)	16-1839-0Z	NUMBER OF CONTAINERS		10001-560
TI CONTACT: HILL SKORGE	MEDIA	4 4 CO		
SAMPLE ID TIME DATE	8	NUMBER OF COLOR	/	
	Air Surface Water Ground Water Soil Sediment	NOW /		REMARKS
B2-LF- 654 1346 1-14-00		1/		
B2-LF - OSF 1345 B2-LF - OSF 1356 B2-LF - OSB 1400 B2-LF - OSB 1400 B2-LF - OSB 1400	V	1 2		
B2. UF - 056 1356		1 V.		
B2-LF- 0.57 /359 B2-LF- 058 /400		1 7		
B2-LF- 058 1400 B2-LF- 060 1405 B2-LF- 060 1410		10		
B2-LF-060 1405		11/		
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RELINGUISHED BY (signature) DATE/TIME	SOTAL NUMBER OF CONTAIN	IERS 8	RECEIVED FOR LAB BY (Signature)	DATE/TIME 1-17-00 10:3()
RECEIVED BY (signature) DATE/TIME	RELINQUISHED BY (signature)	DATE/TIME	CONDITION OF CONTENTS	TEMPERATURE UPON RECEIPT
RELINQUISHED BY (signature) DATE/TIME	RECEIVED BY (signature)	DATE/TIME	REMARKS RUSIX 24 HI	R T.AT.
RECEIVED BY (signature) DATE/TIME	METHOD OF SHIPMENT	AIRBILL NO.		





Chemical Testing Environmental Toxicology Field Services

Certificate of Analysis

REPORTED DATE: February 08, 2000

Page: 1 of 1 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: ABC FACILITY

RECEIVED DATE: 21-JAN-00

PO#:

PBS&J Login Number: 0001-561

PBSJ Sample No.	Client Sample ID	Locator	Collection	date/time
0001-561-01	B2-MR2-LF		01/19/00	16:00:00
0001-561-02	B2-MR2-W		01/19/00	16:05:00
ს001-561-03	B2-MR2-FL		01/19/00	16:10:00
0001-561-04	TRIP BLANK		01/19/00	00:00:00

Thank you for using PBS&J Analytical Services

T.French

PBS&J Project Manager

Reported: February 08, 2000 02:05 PM

Page 1 of 1 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

> 600 University Street, Suite 800 Seattle, WA 98101

(206)587-4648 FAX 624-3679

PBS&J Project Manager: T.French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0001-561-1	Client ID B2-MR2-LF		Date Received 01/21/00	Site			Date & 01/19/0	Time Collected 00 16:00:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/21/00	01/21/00 DMS
beryllium		.00042	mg/ft^2			.00005	5	
PBS&J Sample No. 0001-561-2	Client ID B2-MR2-W		Date Received 01/21/00	Site			Date & 01/19/0	Time Collected
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/21/00	01/21/00 DMS
beryllium		.00053	mg/ft^2			.00005	5	
PBS&J Sample No. 0001-561-3	Client ID B2-MR2-FL		Date Received 01/21/00	Site			Date & 01/19/0	Time Collected 00 16:10:00
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/21/00	01/21/00 DMS
beryllium		.0019	mg/ft^2			.00005	5	
PBS&J Sample No. 0001-561-4	Client ID TRIP BLANK		Date Received 01/21/00	Site			Date & 01/19/0	Time Collected
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Swipe	by ICAP			NIOSH	7300		01/21/00	01/21/00 DMS
beryllium		.00005	U _mg/ft^2			.00005	; ·	

	TETRA TECH, INC.
	15400 NE 90th, Suite 100
[4-]	Redmond, Washington 9805;
	(206) 883-1912
(–)	EAY (206) 881-6997

15400 NE 90th, Si Redmond, Washin	uite 100	52			C	H	ΑII	N	OI	F	Cl	JS	T	9 D	Υ			,			DOCUMENT 0258
(206) 883-1912 FAX (206) 881-699	97															\mathcal{O}	00	- -	5	6	01-04
PROJECT NAME LOCKHE	ED				PROTC	-16 DIEC	NO.	-07	2	ZERS		<u> </u>		$\overline{}$	7	7	/	7			77
SAMPLERS: (signature)	All									NUMBER OF CONTAINERS	7		$\sqrt{\chi}$			/					
PHIL SKOR	GE	4648				MED	IA			OF C	₹			/ /	/	/ /	/ /	/ /	/ /	/ /	
SAMPLE ID	TIME	DATE		8 2	E F		Sediment	19		BER (/	Hola									
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BZ-MRZ-LF	1600	1-19-00						1		1	1										BLOCA IMECH COSTY LIGHT FIX
BZ-MRZ-W	1405	1-19-00						ノ		1	1	'									T' WALL
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REPORTED DATE: February 03, 2000

Page: 1 of 1 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: LOCKHEED BERYLLIUM ABATEMENT-FILTERS

RECEIVED DATE: 11-JAN-00

PO#:

Air Filter Analysis

PBS&J Login Number: 0001-542

PBSJ Sample No.	Client Sample ID	Locator	Collection date/tim				
0001-542-01	BI-AC-1		01/08/00	18:00:00			
0001-542-02	BI-AC-2		01/08/00	18:10:00			
JU01-542-03	BI-AC-3		01/08/00	18:20:00			
0001-542-04	BI-FO-4		01/10/00	16:00:00			
0001-542-05	BI-LR-5		01/10/00	16:05:00			
0001-542-06	BI-NO-6		01/10/00	16:10:00			

Thank you for using PBS&J Analytical Services

T. French

PBS&J Project Manager

Reported: February 03, 2000 04:08 PM

Page 1 of 2 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

(206)587-4648 FAX 624-3679

PBS&J Project Manager: T. French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0001-542-1	Client ID BI-AC-1		Date Received	ß Site			Date & 01/08/	Time Collected 00 18:00:00			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst			
Metals in Air	by ICAP			NIOSH	7300		01/11/00	01/11/00 DM			
beryllium		.00005	U mg/m3			.0000	5				
PBS&J Sample No. 0001-542-2	Client ID BI-AC-2		Date Received	Site			Date & 01/08/6	Time Collected 00 18:10:00			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst			
Metals in Air	by ICAP			NIOSH	7300		01/11/00	01/11/00 DM			
beryllium		.00005	U mg/m3			.0000	5				
PBS&J Sample No. 0001-542-3	Client ID BI-AC-3		Date Received	Site			Date & 01/08/0	Time Collected 00 18:20:00			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst			
Metals in Air	oy ICAP			NIOSH	7300		01/11/00	01/11/00 DM			
beryllium		.00005	U mg/m3			.0000	5				
PBS&J Sample No. 0001-542-4	Client ID BI-FO-4		Date Received 01/11/00	Site			Date & 01/10/0	Time Collected 00 16:00:00			
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst			
Metals in Air 1	oy ICAP			NIOSH	7300		01/11/00	01/11/00 DM			
beryllium		.00005	U mg/m3			.0000	5				
PBS&J Sample No. 0001-542-5	Client ID BI-LR-5		Date Received	Site		Date & Time Collected 01/10/00 16:05:00					
Parameter		Results	Qual Units	Method		MDL	Prepdate	Analyzed Analyst			
Metals in Air k	oy ICAP			NIOSH	7300		01/11/00	01/11/00 DM			
beryllium		.00005	U mg/m3			.00003	5 .				

Reported: February 03, 2000 04:08 PM

Page 2 of 2 Pages

PBS&J Sample No. 0001-542-6

Client ID BI-NO-6

Date Received 01/11/00

Site

Date & Time Collected 16:10:00

01/10/00

Results Qual Units Method MDL Prepdate Analyzed Analyst Parameter Metals in Air by ICAP NIOSH 7300 01/11/00 01/11/00 beryllium mg/m3 .00005 .00005 U

TETRA TECH, INC. 15400 NE 90th, Suite 100 Redmond, Washington 98052 (206) 883-1912 FAX (206) 881-6997

CHAIN OF CUSTODY

PROJECT NAME COCKHEED SARASOTA - BELKLIUM ABATEHRUT 7C-1839-CZ									ERS		7-	eg	7	7	7	7	7	7	7	//	
SAMPLERS: (signature)									OF CONTAINERS	ANALYON		<i>\$</i>								/ /	
TI Contact: PHIL SKC1262 (206) 587-4648					MEDIA						A VA		% } /	/ /	/ /	/ /	/ /	/ /	/ /	/	/ /
SAMPLE ID	TIME	DATE	Air	Surface Water	Ground Water	Soil	Sediment	A.C.Olm		NUMBER C	W.OSH HSOLF	-/						//			0001-542
B1-AC-1	1300	1/8/00						×		4	人										24-hour T.A.T. See sample
BI-AC-Z	1810							X		١	X										Tabels for air flow care +
B1-AC-3	1850	V						~		(X										14-hour T.A.T. See sample Tabels for air flow care + duration
BI-FOTY	1600	1-10-500						X		١	X										Front office - B-1
B1-LB-5	1605	1-10-00						×)	×										LOCKER ROOM
BI-NO-6	1610	1-10-00						×)	¥										NORTH OFFICE-BLOG. 1. +
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REPORTED DATE: February 08, 2000

Page: 1 of 2 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle,, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: LOCKHEED BERYLLIUM ABATEMENT-WIPES

RECEIVED DATE: 26-JAN-00

PO#:

Area Wipe Samples

PBS&J Login Number: 0001-644

PBSJ Sample No.	Client Sample ID	Locator	Collection	date/time
0001-644-01	B2-AC-01		01/24/00	16:00:00
0001-644-02	B2-AC-02		01/24/00	16:05:00
u001-644-03	B2-AC-03		01/24/00	16:10:00
0001-644-04	B2-AC-04		01/24/00	16:15:00
0001-644-05	B2-AC-05		01/25/00	15:30:00
0001-644-06	B2-AC-06		01/25/00	15:35:00
0001-644-07	ENT-PER-B3		01/21/00	16:00:00
0001-644-08	EXT-PER-B3		01/21/00	16:05:00
0001-644-09	ENT-PER-B3		01/25/00	16:00:00
0001-644-10	EXT-PER-B3	·	01/25/00	16:05:00

Thank you for using PBS&J Analytical Services





REPORTED DATE: February 08, 2000

Page: 2 of 2 Pages

PBS&J Project Manager

Reported: February 08, 2000 02:06 PM

Page 1 of 2 Pages

SENT Phil Skorge TO: Tetra Tech, Inc.

> 600 University Street, Suite 800 Seattle, WA 98101

(206)587-4648 FAX 624-3679

PBS&J Project Manager: T. French

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. 0001-644-1	Client ID B2-AC-01		Date 01/26/	Received	Site	•		Date & 01/24/0	Time Collection 16:00:0	
Parameter		Results	Qual Uni	ts	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Air	oy ICAP				NIOSH	7300	ı	01/26/00	01/26/00	DM
beryllium		.00005	U mg	/m3			.0000	5		
3S&J Sample No. 001-644-2	Client ID B2-AC-02		Date 01/26/6	Received 00	Site	,		Date & 01/24/6	Time Collection 16:05:0	
Parameter		Results	Qual Uni	ts	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Air	oy ICAP				NIOSH	7300		01/26/00	01/26/00	DM
beryllium		.00005	U mg	/m3			.00003	5		
PBS&J Sample No. 0001-644-3	Client ID B2-AC-03		Date I 01/26/0	Received	Site			Date & 01/24/0	Time Collection 16:10:0	
Parameter		Results	Qual Uni	ts	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Air	oy ICAP				NIOSH	7300		01/26/00	01/26/00	DM
beryllium		.00005	U mg	/m3			.00003	5		
PBS&J Sample No. 0001-644-4	Client ID B2-AC-04		Date I 01/26/0	Received 00	Site			Date & 01/24/0	Time Collection 16:15:0	
Parameter		Results	Qual Uni	ts	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Air h	oy ICAP				NIOSH	7300		01/26/00	01/26/00	DM
beryllium		.00005	U mg	/m3			.00005	5		
PBS&J Sample No. 0001-644-5	Client ID B2-AC-05		Date I 01/26/0	Received 10	Site			Date & 01/25/0	Time Collect 00 15:30:0	
Parameter		Results	Qual Uni	ts	Method		MDL	Prepdate	Analyzed	Analyst
Metals in Air b	oy ICAP				NIOSH	7300		01/26/00	01/26/00	DM
beryllium		.00005	U mg,	′m3			.00005	5		

Reported: February 08, 2000 02:06 PM

Page 2 of 2 Pages

PBS&J Sample No. 0001-644-6	Client ID B2-AC-06			ate Received 1/26/00	Site			Date & 01/25/0	Time Collected 00 15:35:00
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Air	by ICAP				NIOSH	7300		01/26/00	01/26/00 DM
beryllium		.00005	Ü	mg/m3			.0000	5	
PBS&J Sample No. 0001-644-7	Client ID ENT-PER-B3		-	ate Received /26/00	Site			Date & 01/21/0	Time Collected 00 16:00:00
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Air	by ICAP				NIOSH	7300	•	01/26/00	01/26/00 DM
beryllium		.00005	U	mg/m3			.0000!	ō	
PBS&J Sample No. 0001-644-8	Client ID EXT-PER-B3		_	ate Received /26/00	Site			Date & 01/21/0	Time Collected 00 16:05:00
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Air	oy ICAP				NIOSH	7300		01/26/00	01/26/00 DM
beryllium		.00005	U	mg/m3			.00005	5	
PBS&J Sample No. 0001-644-9	Client ID ENT-PER-B3			ate Received /26/00	Site			Date & 01/25/0	Time Collected 0 16:00:00
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Air	oy ICAP				NIOSH	7300		01/26/00	01/26/00 DM
beryllium		.00005	U	mg/m3			.00005	5	
PBS&J Sample No. 0001-644-10	Client ID EXT-PER-B3			ate Received /26/00	Site			Date & 01/25/0	Time Collected 0 16:05:00
Parameter		Results	Qual	Units	Method		MDL	Prepdate	Analyzed Analyst
Metals in Air b	oy ICAP				NIOSH	7300		01/26/00	01/26/00 DM
beryllium		.00005	U	mg/m3			.00005	5	

TETRA TECH, INC. 15400 NE 90th, Suite 100 Redmond, Washington 98052 (206) 883-1912 FAX (206) 881-6997

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Certificate of Analysis

REPORTED DATE: February 08, 2000

Page: 1 of 1 Pages

To: Phil Skorge

Tetra Tech, Inc.

600 University Street, Suite 800

Seattle, WA 98101

Phone: (206)587-4648

Fax: 624-3679

Your Project: LOCKHEED BERYLLIUM ABATEMENT-FILTERS

RECEIVED DATE: 23-DEC-99

PO#:

Air Filter Analysis

PBS&J Login Number: S912-493

PBSJ Sample No.	Client Sample ID	t Sample ID Locator		Collection date/time				
S912-493-01	B1/PERO1/122199		12/21/99	18:30:00				
⁹ 12-493-02	B1/PERO2/122199		12/21/99	18:35:00				
J912-493-03	B1/PERO1/122299	,	12/22/99	15:30:00				
S912-493-04	B1/PERO2/122299		12/22/99	15:40:00				

Thank you for using PBS&J Analytical Services

T. French

PBS&J Project Manager

RESULTS BY SAMPLE

Reported: February 08, 2000 02:46 PM

Page 1 of 1 Pages

Date & Time Collected

SENT Phil Skorge TO: Tetra Tech, Inc.

> 600 University Street, Suite 800 Seattle, WA 98101

(206)587-4648 FAX 624-3679

PBS&J Project Manager: T. French

Client ID

PBS&J Sample No.

This is to certify that the following samples were analyzed using good laboratory practices to show the following results:

PBS&J Sample No. S912-493-1	Client ID B1/PERO1/122199	Date Received 12/23/99	Site		Date & Time Collected 12/21/99 18:30:00			
Parameter	Results	Qual Units	Method	MDL	Prepdate	Analyzed Analyst		
Metals in Air E Method 7300 (IC	=	,	NIOSH 7300		12/28/99	12/28/99 DM		
beryllium	.0000	5 U mg/m3		.00005	5			
PBS&J Sample No. S912-493-2	Client ID B1/PERO2/122199	Date Received 12/23/99	Site		Date & 12/21/9	Time Collected 9 18:35:00		

Parameter	Results Qual Units	Method	MDL	Prepdate	Analyzed Analyst
Metals in Air By NIOSH Method 7300 (ICAP)		NIOSH 7300		12/28/99	12/28/99 DM

beryllium	.00005	U mg/m3	.00005	
PBS&J Sample No. S912-493-3	Client ID B1/PERO1/122299	Date Received	Site	Date & Time Collected 12/22/99 15:30:00

Parameter	Results	Qua	Units	Method		MDL	Prepdate	Analyzed /	Analyst
Metals in Air By NIOSH Method 7300 (ICAP)			4	NIOSH	7300		12/28/99	12/28/99	DM
beryllium	.00005	U	mg/m3			.0000	5		

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Parameter	Results	Qual Uni	ts Method	MD	L Prepdate	Analyzed	Analyst
Metals in Air By Method 7300 (ICA		,	NIOSH	7300	12/28/99	12/28/99	DM
beryllium	.0000	5 U mg,	/m3	.00	005		

Date Received

Site

TETRA TECH, INC. 15400 NE 90th, Suite 100 Redmond, Washington 98052 (206) 883-1912 FAX (206) 881-6997

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Former American Beryllium Company Decontamination and Abatement of Beryllium Impacted Materials Final Report

Prep	ared	for:

Lockheed Martin Corporation Burbank, California

Prepared by:

Tetra Tech, Inc. Pasadena, California

Dan Batrack Program Manager

Phil Skorge
Project Manager

Nisha Bansal

Technical Reviewer

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A Laboratory Data Reports

Section 1 Introduction

On behalf of Lockheed Martin Corporation (Lockheed Martin), Tetra Tech, Inc. has prepared the following report documenting the abatement of beryllium-impacted materials and building surfaces at Lockheed Martin's former American Beryllium Company (ABC) facility in Tallevast, Florida. Beryllium residues detected in various building materials within Buildings 1, 2, 3, 4, and 5 of the ABC facility were abated (by removal or decontamination) in order to reduce potential airborne beryllium hazards that may occur during future occupancy of the facility. The abatement program was coordinated with Law Environmental, Inc., on behalf of Waters, Telsey, and Puma, Inc. (WTP), for concurrence that the property was considered suitable for occupancy. The primary objectives of the abatement program were as follows:

- Remove and dispose of beryllium-impacted ceiling materials (tiles, grid, insulation), HVAC ductwork, air handlers, and carpets in accordance with appropriate federal and state disposal criteria;
- 2. Decontaminate interior building surfaces in order to reduce beryllium surface wipe concentrations to below 25 μ g/ft²;
- 3. Ensure that no airborne concentrations within the buildings exceed OSHA's 0.002 mg/m³ Permissible Exposure Limit (PEL) following abatement.

This report summarizes the abatement activities in December 1999 through February 2000 and presents the surface wipe and air sample data collected following abatement. Clearance sampling data indicate that beryllium abatement objectives have been attained.

In addition to beryllium abatement, this report also documents the removal of chromium impacted plating ductwork in Building 5. Following decontamination and removal of the ductwork, the plating shop building surfaces were decontaminated. Building surfaces were then sampled and analyzed for total chromium. No regulatory surface wipe criteria are available for for chromium.

This abatement report has been organized into the following sections:

- <u>Section 2</u> Site Background, presenting background information on facility conditions, baseline beryllium analytical data, interim beryllium abatement sampling results, and facility-wide beryllium assessment sampling results;
- Section 3 Evaluation of Published Regulatory Standards, reviewing available regulatory standards and establishing appropriate beryllium and chromium standards to be used during the decontamination and abatement project;
- Section 4 Beryllium Abatement Program, presenting the approach used to identify
 materials requiring abatement; evaluate the extent of abatement; decontaminate and abate
 beryllium-impacted materials; and, perform final clearance sampling to verify that
 cleanup goals have been attained;
- Section 5 Conclusions, presenting conclusions derived from the abatement program;
- Section 6 References, presenting a list of previous reports referenced in this final report.

Copies of the surface wipe and air clearance sampling laboratory data and chain-of-custody records are presented in Appendix A.

Section 2

Site Background

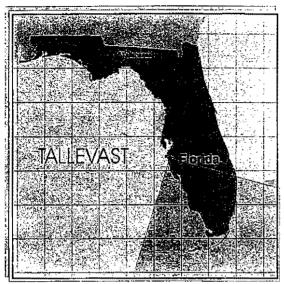
This section provides site information, including a description of the location, past operations of the facility, and a summary of data collected at the facility prior to the final beryllium abatement activities.

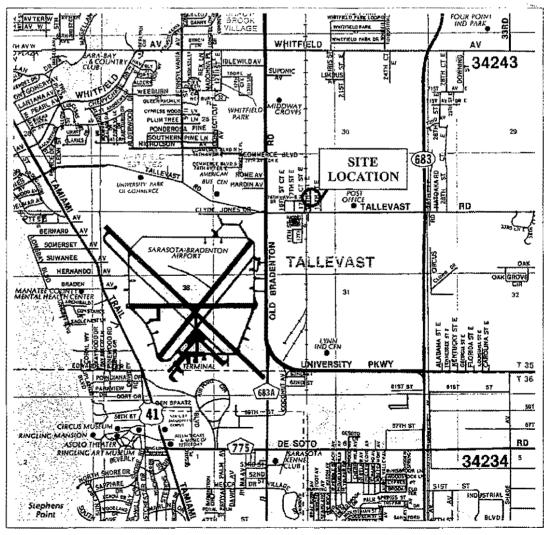
2.1 FACILITY DESCRIPTION

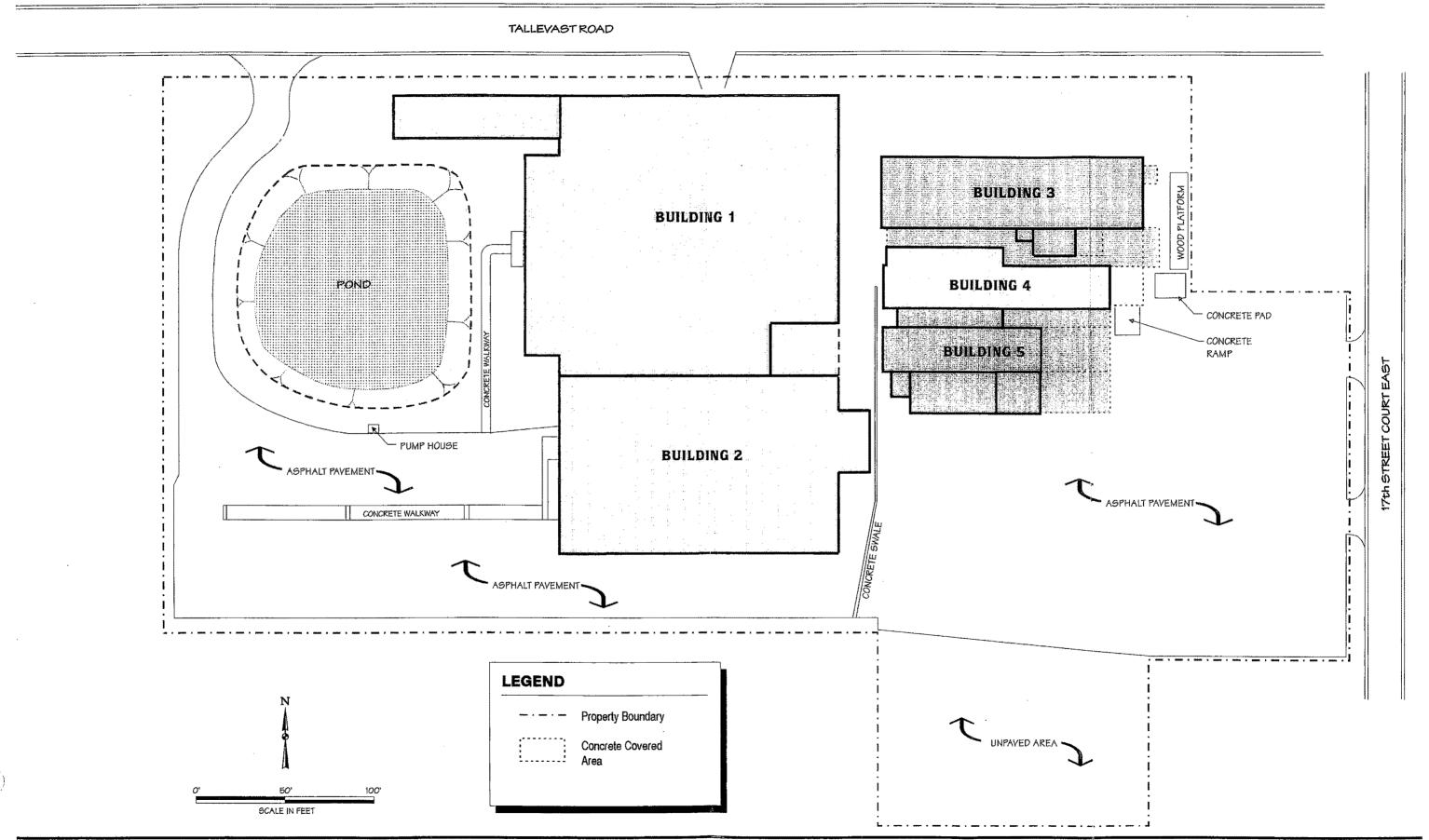
The former ABC facility is located at 1600 Tallevast Road in Tallevast, Manatee County, Florida - See Figure 2-1. The property consists of 5.167 acres of land including approximately 66,335 square feet of buildings and covered areas. The former ABC facility was used primarily as an ultra-precision machine parts manufacturing plant. The facility operations consisted of a machining and fabricating plant where metals including beryllium were milled, lathed, and drilled into various components. Operations at the former ABC facility were discontinued on September 27, 1997. The property is currently in the process of being converted to a non-beryllium use facility.

The facility consists of five main buildings, the largest of which is Building 1, followed in decreasing order of size by Buildings 2, 3, 5 and 4. Buildings 1, 2, and 3 were used for machining and inspection; Building 4 was used for wood working and material storage; and Building 5 was used for plating and anodizing, wastewater treatment, and material storage. Figure 2-2 presents an overview of the former ABC facility. Current floor plans for the major building areas are provided in Section 4.

FIGURE 2-1 SITE LOCATION MAP







2.2 SUMMARY OF DATA COLLECTED PRIOR TO FINAL ABATEMENT

Data collected prior to the final beryllium abatement activities at the former ABC facility include (1) baseline assessments of the Buildings 1, 2, and 3 beryllium machining areas. (2) interim abatement activities at the Buildings 1, 2 and 3 beryllium machining areas. and (3) the facility-wide beryllium assessment.

2.2.1 Baseline Assessments of Buildings 1, 2, and 3 Beryllium Machining Areas

In November 1996, Tetra Tech collected 28 wipe samples from various beryllium-machining areas to evaluate the potential presence and concentration of beryllium residues within the facility. Wipe samples were collected from residues on doors, walls, floors and other surfaces located in Buildings 1, 2 and 3. Beryllium was detected in all 28 samples at a maximum concentration of 871 μ g/ft². Wipe sampling was not performed in Buildings 4 and 5.

Over a 4-day period from December 2 to 5, 1996, a total of 68 air samples were collected at the ABC facility to determine if beryllium was present in the breathing zone. The air samples were analyzed in accordance with National Institute of Occupational Safety and Health (NIOSH) Method 7300. Beryllium was not detected in any of the 68 samples collected from the site.

During a Facility Assessment conducted in June 1997, Tetra Tech collected 78 additional wipe samples from various equipment and features associated with the former beryllium machining operations. Wipe samples were collected from various ceiling materials (including ceiling tiles, grid, insulation), PVC pipe vacuum collection systems, and exhaust stacks in Buildings 1, 2, and 3. Additional wipe samples were collected from various floor drains and sumps located in Buildings 4 and 5 (only buildings with sumps and floor drains present). Beryllium was detected in all 78 wipe samples ranging from 4.1 to 120,000 µg/ft².

2.2.2 Interim Abatement and Decontamination of Buildings 1, 2, and 3 Beryllium Machining Areas

In September and October 1999, Tetra Tech conducted abatement of identified beryllium-impacted building materials within the Buildings 1, 2, and 3 machine shop areas to a self-determined cleanup level of $46.5 \,\mu\text{g/ft}^2$. Three mechanical rooms in Building 1 were included in the abatement. In addition, six sumps and floor drains within Buildings 4 and 5 that reported beryllium above $46.5 \,\mu\text{g/ft}^2$ were also flushed and decontaminated. Abatement actions consisted of the following:

- Removal of all ceiling materials, including drop ceiling tiles, grid, and insulation. HVAC ductwork was not removed;
- Removal of beryllium dust vacuum piping and exhaust stacks;
- Decontamination of all interior surfaces, including walls, floors, and exterior ceiling materials (light fixtures, HVAC ductwork). Interior HVAC ductwork was not decontaminated;
- Decontamination of six floor drains and sumps within Buildings 4 and 5.

Bulk materials were packaged (single bagged in six-millimeter thick polyethylene) and stored in a storage bin in preparation for disposal. Disposal was conducted in accordance with applicable federal regulations stated in 40 CFR Part 261 and state regulations provided in the Florida Administrative Code (FAC). In accordance with CFR and FAC waste classification criteria, the beryllium impacted materials and wastewater was not defined as a hazardous waste – see Section 3. Beryllium-impacted materials were transported and disposed of at the Manatee County landfill.

Interior building surfaces were decontaminated using pressure wash or wipe down methods. Decontamination water was transported as a non-hazardous waste to Clark Environmental's permitted treatment and recycling facility located in Mulberry, Florida.

Abatement was conducted in these areas until beryllium concentrations were reduced to below a surface wipe limit of 46.5 µg/ft². A summary description of the building areas, the method of

abatement (decontamination or removal), and the beryllium concentration ranges reported in the surface wipe samples is presented in Table 2-1.

Table 2-1
Summary of Interim Beryllium Abatement Program

Building Feature	Location	Abatement Action	Final Surface Wipe Concentration Range (μg/ft²)
Ceiling Tile, Grid and Fiberglass	Building 1 Building 2 Building 3	Removal	Not Applicable
Other Ceiling Materials (light fixtures, exterior ductwork, etc.)	Building 1 Building 2 Building 3	Decontamination	ND – 20.0 ND – 2.45
Exhaust Stacks / Piping	Building 1 Building 2 Building 3	Removal	Not Applicable
Walls	Building 1 Building 2 Building 3	Decontamination	ND - 40.4 ND - 32.8 ND - 1.01
Floors	Building 1 Building 2 Building 3	Decontamination	ND – 46.4 ND – 36.4 ND – 15.5
Building 5 Floor Drains	Floor Drain No.2 Floor Drain No.3 Floor Drain No.4	Decontamination	44.8 22.5 7.92
Building 5 Sumps	Sump No. 1 Sump. No.3 Sump No. 5	Decontamination	12.3 4.99 16.1

Air samples were collected from the abatement areas following the interim decontamination and surface wipe sampling. A total of five air samples were collected from Buildings 1, 2 and 3 (two samples from each building). Beryllium was not detected in any of the air samples.

2.2.3 Facility-Wide Beryllium Assessment

From September through November 1999, additional beryllium assessment was conducted in other areas of the former ABC facility where no data had previously been collected. Areas and building materials that were sampled for beryllium included the air conditioning system (supply and return ductwork and air handlers), office areas, mechanical rooms, Buildings 4 and 5, and the former Lancy treatment system and waste storage yards. A summary of the areas that were assessed and the beryllium concentration range in the materials is presented in Table 2-2.

Table 2-2
Summary of Facility-Wide Beryllium Assessment

Building	Area	Material	Number of	Surface Wipe
			Samples	Concentration Range (µg/ft ²)
#1	Mechanical Room #1	A/C air handlers	3	302 - 828
#2	Mechanical Room #2	A/C air handlers	2	3.35 - 93.5
#1	Mechanical Room #3	A/C air handlers	2	83 – 1510
#1	Mechanical Room #4	A/C air handlers	2	133 – 3130
#3	Mechanical Room #5	A/C air handlers	3	8.3 - 4070
#3	Mechanical Room #6	A/C air handlers	2	57.4 – 929
#1	Machine Shops	Interior A/C ductwork	11	100 – 9110
#2	Machine Shops	Interior A/C ductwork	9	2.08 - 31.8
#3	Machine Shops	Interior A/C ductwork	4	4.32 - 16.8
#1 and #2	Office Areas	Walls	12	ND - 2.33
#1 and #2	Office Areas	Floors	6	19.5 – 952
#1 and #2	Office Areas	Ceiling materials	12	ND - 42.7
#1 and #2	Office Areas	Interior Ductwork	12	ND - 105
#2	Mechanical Room #2	Floors	3	56.2 - 139
#2	Mechanical Room #2	Walls	3	4.11 – 15.3
#2	Mechanical Room #2	Ceiling Materials	3	67.5 – 186
#2	Oil Storage / Transformer Room	Floors	3	877 – 1440
#2	Oil Storage / Transformer Room	Walls	3	19.2 - 358
#2	Oil Storage / Transformer Room	Ceiling Materials	3	2.57 - 12.4
#2	Loading Dock Office	Walls, floors, ceiling materials, HVAC ducts + vents	6	34.3 – 526
#1	Locker Room	Floors	3	18.4 - 581
#1	Locker Room	Walls	3	13.2 - 55.9
#1	Locker Room	Ceiling Materials	3	87.7 – 653
#1	Locker Room	HVAC ducts + vents	2	70.2 - 76.5
#3	Office Areas	Floors	3	6.34 - 115
#3	Office Areas	Walls	3	ND - 16.1
#3	Office Areas	Ceiling Materials	4	3.38 - 24.7
#3	Office Areas	HVAC ducts + vents	4	10.9 - 265
#3	Former Be Vacuum system, east side of building	Walls, floors, and ceiling materials	6	6.3 - 16000
#3	Oil / Coolant Storage Room	Floor	2	237 - 621
#3	Filter Press Shed /	Walls, floors, ceiling	6 .	57.8 - 1360
#4	Cleaning Area Process Rooms / Warehouse	materials	4	221 2100
		Floors Walls		321 -2100 ND 1970
#4 #4	Process Rooms / Warehouse		5 2	ND -1870
#4	Process Rooms / Warehouse Process Rooms / Warehouse	Ceiling materials HVAC ducts + vents	30	28.2 - 66.3
#5	Plating / Anodizing Rooms	Floors	4	8.54 – 9.92 6.50 – 263
#5	Plating / Anodizing Rooms	· Walls	4	1.83 - 54.7
#5	Plating / Anodizing Rooms	Ceiling materials	3	22.1 - 110
#5	Plating / Anodizing Rooms	HVAC ducts + vents	4	44.5 – 115
#5	Former Lancy Treatment System, and hazardous waste areas	Walls, floors, ceiling materials, plating ducts	9	8.87 – 213
#5	Former chemical storage area	Floor	2	59.2 – 466
8	The second secon			1 Prim 100

As presented in Section 3, the prospective purchaser of the property recommended using $25 \,\mu g/ft^2$ as a site-specific surface cleaning standard for the ABC facility. For this reason, additional decontamination and abatement actions were conducted at the former ABC facility. The final decontamination and abatement activities are summarized in Sections 4 and 5.

Section 3

Evaluation of Published Regulatory Standards

3.1 SURFACE WIPE STANDARDS

No specific regulatory standards for beryllium in surface wipe samples have been published by federal, state or municipal regulatory agencies. The initial surface wipe limit of $46.5 \, \mu g/ft^2$ recommended by Lockheed Martin was based on the range of surface wipe limits recommended or adopted at various DOE facilities (Tetra Tech, 1996). However, the environmental engineering consultant for the prospective purchaser (Law Environmental, Inc.) recommended using a surface wipe cleaning standard of $25 \, \mu g/ft^2$ for the ABC facility. At Lockheed Martin's request, a beryllium limit of $25 \, \mu g/ft^2$ was established to identify areas for abatement.

No regulatory surface wipe criteria are available for chromium residues on building surfaces. Therefore, no cleanup standards were established for the ABC facility.

3.2 OSHA STANDARDS FOR WORKER PROTECTION

The Occupational Safety and Health Administration (OSHA) has published a permissible exposure limits (PEL) for beryllium as an airborne contaminant for worker protection. The OSHA mandated exposure limits are shown in Table 3-1.

Table 3-1
Exposure Limits for Beryllium

Compound	PEL 8-hour TWA	Ceiling Concentration	IDLH
Beryllium	0.002 mg/m ³	0.005 mg/m^3	4 mg/m ³

Source: Federal OSHA 29 CFR. 1910. 1000, Air Contaminants

National Institute for Occupational Safety and Health (NIOSH)

Notes: PEL - Permissible Exposure Limit TWA - Time Weighted Average

IDLH - Immediately Dangerous to Life or Health

3.3 WASTE CLASSIFICATION AND DISPOSAL STANDARDS

A review of applicable federal regulations in 40 CFR Part 261 and the Florida Administrative Code (FAC) was conducted to determine the appropriate classification and disposal criteria for beryllium wastes generated during the decontamination and abatement program. Three types of wastes were generated: (1) bulk solid materials that contained beryllium residues (i.e., ceiling tiles, insulation, etc.); (2) bulk solid materials that contained chromium residues (i.e., Building 5 plating ductwork); and (3) wastewater from decontamination of building surfaces.

3.3.1 Beryllium Impacted Materials

In accordance with CFR and FAC waste classification criteria, beryllium residues on bulk materials do not meet the definition of a characteristic or listed hazardous waste. Beryllium residues are not corrosive, reactive, ignitable, or toxic. In addition, since the waste was generated during machining operations and is not commercial chemical beryllium powder, a P015 listing in 40 CFR Part 261.33(e) is not applicable.

3.3.2 Chromium Impacted Materials

In accordance with CFR and FAC waste classification criteria, chromium residues on the bulk materials do not meet the definition of a characteristic or listed hazardous waste. The chromium residues were not derived from any waste processes listed in the federal or state hazardous waste regulations. Chromium residues do not meet the definition of corrosive, reactive, or ignitable wastes. To determine toxicity, samples were collected from the materials and analyzed using the Toxicity Characteristic Leaching Procedure (TCLP). The residues did not exceed the TCLP, indicating the materials are not hazardous by the toxicity characteristic - see Section 4.2.7.

3.3.3 Decontamination Wastewater

Wastewater generated from decontamination of the building materials are non-hazardous based on the classification criteria described in Sections 3.3.1 and 3.3.2.

Section 4

Beryllium Abatement Program

The following section describes the technical approach, scope of work and field methodology followed to complete the decontamination and abatement of beryllium impacted materials at the ABC facility. The abatement program was implemented from December 1999 through February 2000. Abatement activities were performed in accordance with Tetra Tech's <u>Decontamination</u> and Abatement of Beryllium Impacted Materials Work Plan, Former American Beryllium Company, dated November 30, 1999.

4.1 PROJECT APPROACH

In order to facilitate property transfer, a surface wipe limit of 25 μ g/ft² was selected as a guideline for abatement to reduce the potential for airborne beryllium hazards at the former ABC facility. As described in Section 2.2, beryllium concentrations were detected above 25 μ g/ft² in building materials throughout the facility. The abatement approach was to first remove beryllium-impacted materials that could not easily be decontaminated (ceiling materials, air handlers, HVAC ductwork, and carpets). Approximately 60 linear feet of ductwork associated with former plating and anodizing lines in Building 5 were also removed. Following removal of the materials, all accessible interior building surfaces (floors, walls, light fixtures, etc.) were subsequently decontaminated to below the beryllium cleanup level of 25 μ g/ft². A summary of the abatement activities performed at the ABC facility is described in Table 4-1.

Table 4-1
Beryllium Impacted Areas and Final Abatement Actions^a

Building Feature	Location	Abatement Action
Ceiling tiles, grid, fiberglass	Buildings 1, 2, 3 office areas, and Buildings 4 and 5	Removed
Other ceiling materials (light fixtures, etc.)	Buildings 1, 2, 3, 4, and 5	Decontaminated
HVAC ductwork .	Buildings 1, 2, 3, 4, and 5	Removed
Air handlers ^b	Buildings 1, 2, 3, 4, and 5	Removed
Beryllium vacuum piping	Building 4	Removed
Carpeting	Buildings 1, 2, and 3 (primarily office areas)	Removed
Walls, floors and other interior surfaces (includes floors below carpeted areas)	Buildings 1, 2, 3, 4, and 5	Decontaminated
Former Be vacuum system	Building 3, east side of building	Decontaminated
Filter press shed	Building 3	Decontaminated
Former Lancy Treatment System and hazardous waste / chemical storage area	Building 5	Decontaminated
Plating ductwork	Building 5	Removed
Sumps / Floor drains	Buildings 3 and 5	Decontaminated

a – Abatement activities focused on beryllium. However, decontamination activities in the Building #5 plating areas were also intended to remove chromium residues.

Following abatement activities, clearance sampling was performed to document that the beryllium abatement objectives had been attained. Both surface wipe and air clearance samples were collected and compared to site-specific clearance criteria.

b - Roof units were not removed.

4.2 FIELD METHODOLOGY

A description of each major task associated with the abatement program is presented in the following subsections:

4.2.1 Work Area Preparation and Isolation

Prior to disturbance of impacted materials, a work enclosure and decontamination facility was installed at each work area. The enclosure consisted of a single layer of polyethylene on all walls and floors designated for decontamination and abatement. A negative air chamber containing a HEPA filter system was installed within each work area to prevent particulate migration to areas outside the enclosure. This system remained in operation until final clearance samples were collected to document that no airborne beryllium hazards were present.

A decontamination facility was located at the egress point of the work area. All personnel and equipment within the work area were decontaminated prior to egress. A waste load out area was constructed for the decontamination and load out of beryllium waste packages prior to disposal.

4.2.2 Removal and Decontamination of Beryllium Impacted Materials

All beryllium impacted ceiling tiles (includes grid and insulation), vacuum piping, HVAC ductwork, air handlers, and carpets were removed from the former ABC facility. Ductwork from the Building 5 plating area was also removed. Prior to and during bulk removal, the materials were misted with an encapsulant to prevent airborne dust emissions. The materials were packaged (single bagged in six-millimeter thick polyethylene) and stored in a storage bin in preparation for disposal.

Following removal of bulk materials, the interior surface areas (walls, floors, ceiling materials, sumps and floor drains) were decontaminated using pressure wash and wipe down methods. All surface areas were decontaminated to the beryllium action level of 25 μ g/ft². Decontamination

water was collected and stored in a storage tank pending disposal. The tank was also used to store decontamination water generated from PPE cleaning.

4.2.3 Perimeter Air Monitoring during Abatement

During abatement and decontamination activities, perimeter air samples were collected to ensure and document that no fugitive beryllium emissions were released outside the containment area. The samples were collected using personal air sampling pumps that flowed at 3 liters per minute. Two perimeter air samples were collected during each work day; one sample was collected at the entrance to the work enclosure area; and one sample was collected at the HEPA filter exhaust. All perimeter air samples were analyzed for beryllium using either NIOSH Method 7300 or USEPA Method 6010A.

4.2.4 Clearance Wipe Sampling

Following decontamination of the building surfaces, clearance wipe samples were collected to ensure that the action level of $25 \,\mu\text{g/ft}^2$ had been attained. When a swipe sample exceeded the $25 \,\mu\text{g/ft}^2$ cleanup level, the surrounding area out to the nearest clean sampling point was recleaned. The area was then resampled to confirm that cleanup standards were attained.

Representative samples were collected from each area and material type that was decontaminated. Sample frequencies and locations in the major buildings (Buildings 1, 2, 3, 4, and 5) were determined using the following general methodology for each material type. For walls and floors, 8 samples were collected per 100 ft. x 100-ft. area (total 10,000-ft² area). For ceiling light fixtures, samples were collected at a rate of 8 per 100 fixtures (8% of the total fixtures counted at the facility). Samples were also collected from miscellaneous areas with different material types. Samples were collected throughout the buildings to provide adequate geographic coverage for each material type. Figures 4-1 through 4-12 present the surface wipe sampling locations. A summary of the clearance sampling counts for each building is provided below:

Building 1 clearance samples

- 1. Floor samples Building 1 contains approximately 18,000 ft² of floors in the former machining areas, and 4,500 ft² in the former office areas. Based on the estimated square footage, 14 clearance samples were collected from the former machining areas and 5 were collected from the former office areas see Figure 4-1.
- 2. Wall samples Building 1 contains approximately 13,685 ft² of walls in the former machining areas, and 16,500 ft² in the former office areas. Based on the estimated square footage, 14 clearance samples were collected from the former machining areas and 10 were collected from the former office areas see Figure 4-2.
- 3. Ceiling light fixture samples Building 1 contains approximately 268 light fixtures. Based on the estimated light fixture count, 18 clearance samples were collected from Building 1 (9 from the former machining areas and 9 from the former office areas) see Figure 4-3.
- 4. <u>Samples from miscellaneous areas</u> Additional rooms and areas sampled in Building 1 include Mechanical Room #1, Mechanical Room #3, Mechanical Room #4, the locker room, and the oil storage area. Three samples (1 floor, 1 wall, and 1 light fixture) were collected from each of these rooms see Figures 4-1 through 4-3.

Building 2 clearance samples

- Floor samples Building 2 contains approximately 11,000 ft² of floors in the former machining areas, and 5,250 ft² in the former office and engineering areas. Based on the estimated square footage, 9 clearance samples were collected from the former machining areas and 5 were collected from the former office and engineering areas see Figure 4-4.
- 2. Wall samples Building 2 contains approximately 19,950 ft² of walls in the former machining areas, and 8,200 ft² in the former office and engineering areas. Based on the

- estimated square footage, 17 clearance samples were collected from the former machining areas and 7 were collected from the former office and engineering areas see Figure 4-5.
- 3. Ceiling light fixture samples Building 2 contains approximately 158 light fixtures in the former machining areas, and 107 light fixtures in the former office and engineering areas. Based on the estimated light fixture count, 12 clearance samples were collected from the former machining areas and 9 were collected from the former office and engineering areas see Figure 4-6.
- 4. <u>Samples from miscellaneous areas</u> Additional rooms and areas sampled in Building 2 include Mechanical Room #2 and the former loading dock office. Three samples (1 floor, 1 wall, and 1 light fixture) were collected from each of these rooms see Figures 4-4 through 4-6.

Building 3 clearance samples

- Floor samples Building 3 contains approximately 6,000 ft² of floors in the former machining and office areas. Based on the estimated square footage, 5 clearance samples were collected from the machining and office areas. A wipe sample was also collected from a floor drain and a sump in the building see Figure 4-7.
- Wall samples Building 3 contains approximately 9,645 ft² of walls in the former machining and office areas. Based on the estimated square footage, 8 clearance samples were collected from the machining and office areas see Figure 4-8.
- 3. Ceiling light fixture samples Building 3 contains approximately 89 light fixtures in the former machining and office areas. Based on the estimated light fixture count, 8 clearance samples were collected from the former machining and office areas see Figure 4-9.
- 4. <u>Samples from miscellaneous areas</u> Additional rooms and areas sampled in Building 3 include Mechanical Room #5 (also referred to as oil/coolant storage room), a former

filter press shed, and a former beryllium vacuum system shed. Three samples (1 floor, 1 wall, and 1 light fixture) were collected from each of these rooms - see Figures 4-7 through 4-9.

Buildings 4 and 5 clearance samples

- Floor samples Buildings 4 and 5 contains approximately 8,085 ft² of floors in the former laboratory and process areas. Based on the estimated square footage, 7 clearance samples were collected from the former laboratory and process areas. A wipe sample was also collected from a floor drain in Building 5 see Figure 4-10.
- 2. <u>Wall samples</u> Buildings 4 and 5 contain approximately 8,305 ft² of walls in the former laboratory and process areas. Based on the estimated square footage, 7 clearance samples were collected from the machining and office areas see Figure 4-11.
- 3. Ceiling light fixture samples Buildings 4 and 5 contain approximately 100 light fixtures in the former laboratory and process areas. Based on the estimated light fixture count, 8 clearance samples were collected from the former laboratory and process areas see Figure 4-12.
- 4. <u>Samples from miscellaneous areas</u> Additional rooms and areas sampled in Buildings 4 and 5 include the former treatment system and chemical storage area located east of the building. Three samples (1 floor, 1 wall, and 1 light fixture) were collected from this area see Figures 4-10 through 4-12.

The clearance swipe samples were collected using laboratory supplied wipe media templates. A 12-inch by 12-inch area was first outlined on the sampled surface. The samples were then collected by applying an "S" shaped motion once with its entire surface and then again in the opposite direction with a half-folded surface. Each wipe sample was then folded once more and placed in separate vial containers. Disposable surgical gloves were used to prevent cross

contamination of the samples. The samples were analyzed for beryllium using EPA Method 6010A. The chromium samples were analyzed using EPA Method 6010A.

4.2.5 Clearance Air Sampling

Clearance air samples were collected from each building to ensure that no airborne beryllium hazards exist following decontamination. The samples were collected using personal air sampling pumps that flowed at approximately 3 liters per minute. The samples were collected at positions ranging from 4 to 6 feet above ground surface to simulate the breathing zone of future facility occupants. The following number of clearance samples were collected from each building:

Table 4-2
Summary of Air Clearance Samples

Building Number	Number of Air Samples
1	6
2	6
3	2
4	2
5	2

Sampling pumps were calibrated before and after the sampling events. The air samples were analyzed for beryllium using NIOSH Method 7300 or USEPA Method 6010A. Air clearance sample locations are shown on Figures 4-13 through 4-16.

4.2.6 Disposal of Beryllium Impacted Materials

The beryllium impacted bulk materials and wastewater were disposed of in accordance with applicable CFR and FAC waste classification criteria. As outlined in Section 3.3, the beryllium residues on the bulk materials do not meet the definition of a characteristic or listed hazardous waste and were therefore not disposed of as a hazardous waste. The bulk materials were transported to the Manatee County landfill.

As outlined in Section 3.3, the decontamination water was also determined to be non-hazardous. The decontamination water was therefore transported as a non-hazardous waste to Clark Environmental's permitted treatment and recycling facility located in Mulberry, Florida.

4.2.7 Removal and Disposal of Chromium Impacted Plating Ductwork

Approximately 60 linear feet of ductwork associated with former plating and anodizing lines in Building 5 and the former treatment storage area were removed. Prior to disposal, the ductwork was cut into sections and then decontaminated to remove visible residues and stains. To determine if the materials were a hazardous waste, a bulk sample was collected from the ductwork and analyzed for chromium using the TCLP method. The sample reported a concentration of 2.5 mg/L of chromium, which is below the chromium toxicity criterion of 5 mg/L. The bulk materials were subsequently transported as a non-hazardous waste to the Manatee County landfill.

Following removal of the ductwork from Building 5 and the former treatment storage area, the interior surfaces (walls, floors, ceilings) were decontaminated in accordance with the methods prescribed in Section 4.2.2. Surface wipe samples were collected from the building surfaces to document post-decontamination chromium concentrations. No wipe sample criteria were identified for chromium.

4.3 SUMMARY OF ANALYTICAL DATA

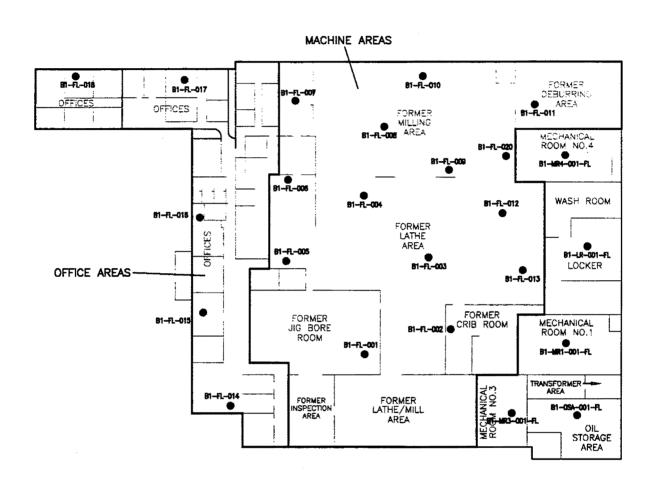
4.3.1 Surface Wipe Sampling Data

Surface wipe samples were collected during and after abatement to document that the site-specific beryllium cleanup standard of $25\mu g/ft^2$ was attained. All final clearance samples show that the surface cleaning standards have been attained. Copies of the laboratory data reports are presented in Appendix A. A summary of the final beryllium clearance data is presented in Table 4-3 on pages 4-27 to 4-29. A summary of the chromium surface wipe data is presented in Table 4-4 on page 4-30.

4.3.2 Air Clearance Sampling Data

Air clearance samples were collected after abatement to document that airborne beryllium concentrations within the buildings did not exceed OSHA's 0.002 mg/m³ PEL. All air clearance samples did not report concentrations above the detection limit of 0.00005 mg/m³. Copies of the laboratory data reports are presented in Appendix A. A summary of the final clearance data is presented in Table 4-4 on page 4-29.

FIGURE 4-1 BUILDING 1 FLOORS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B1-FL-001 SWIPE SAMPLES

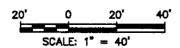
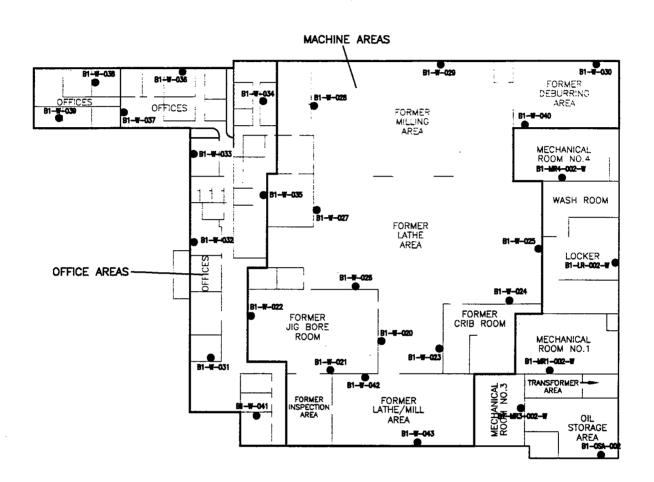


FIGURE 4-2 BUILDING 1 WALLS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B1-W-021 SWIPE SAMPLES

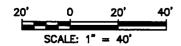
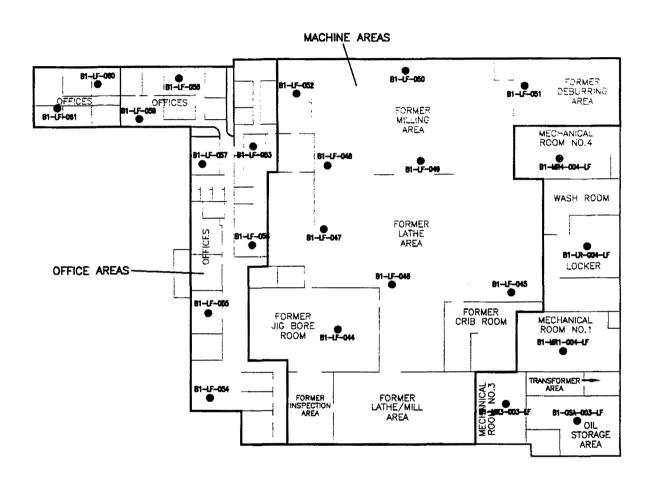




FIGURE 4-3 BUILDING 1 LIGHT FIXTURES CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B1-LF-044 SWIPE SAMPLES

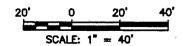
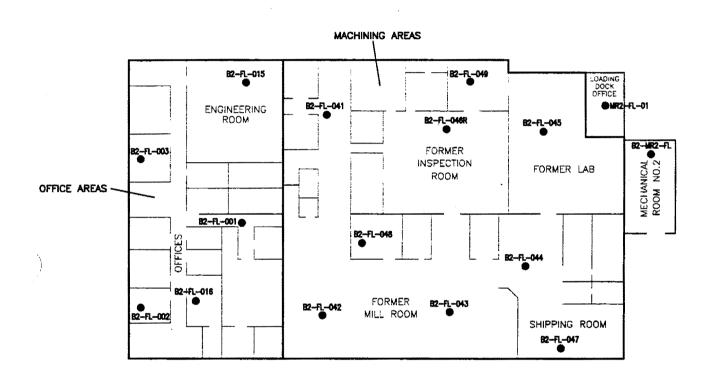




FIGURE 4-4 BUILDING 2 FLOORS CLEARANCE WIPE SAMPLE LOCATIONS

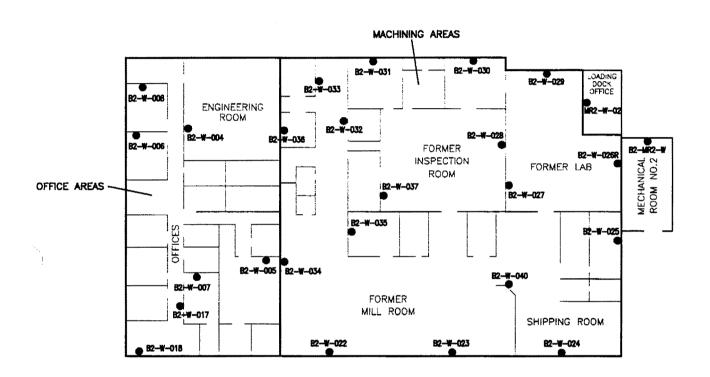


LEGEND

● B2-FL-042 SWIPE SAMPLES



FIGURE 4-5 BUILDING 1 WALLS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B2-W-022 SWIPE SAMPLES

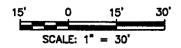
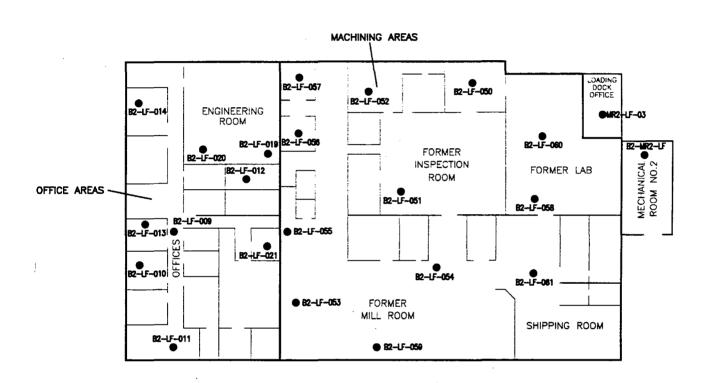


FIGURE 4-6 BUILDING 2 LIGHT FIXTURES CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B2-LF-051 SWIPE SAMPLES

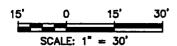
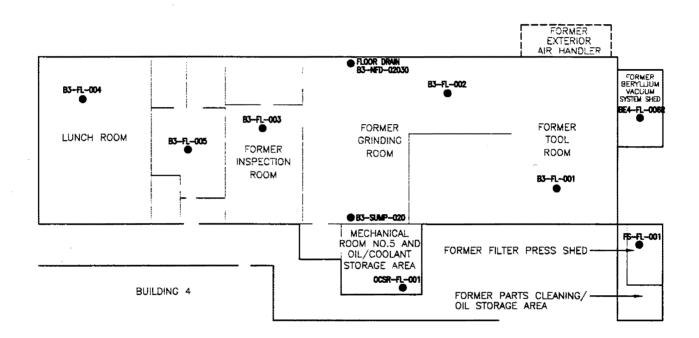




FIGURE 4-7 BUILDING 3 FLOORS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B3-FL-001 SWIPE SAMPLES

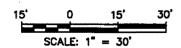
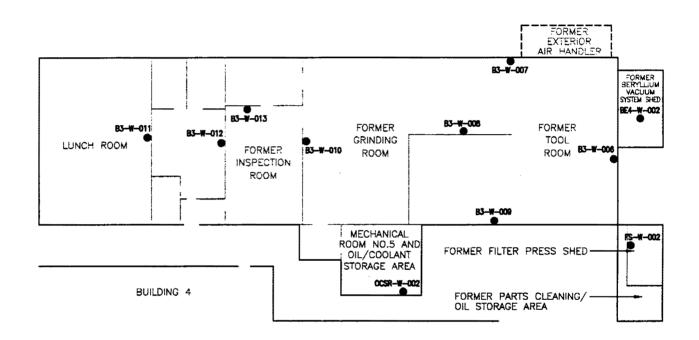


FIGURE 4-8 BUILDING 3 WALLS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

■ B3-W-006 SWIPE SAMPLES

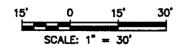
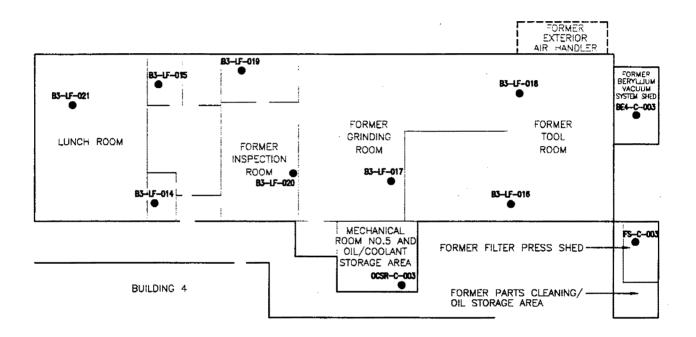




FIGURE 4-9 BUILDING 3 LIGHT FIXTURES CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B3-LF-014 SWIPE SAMPLES

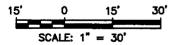
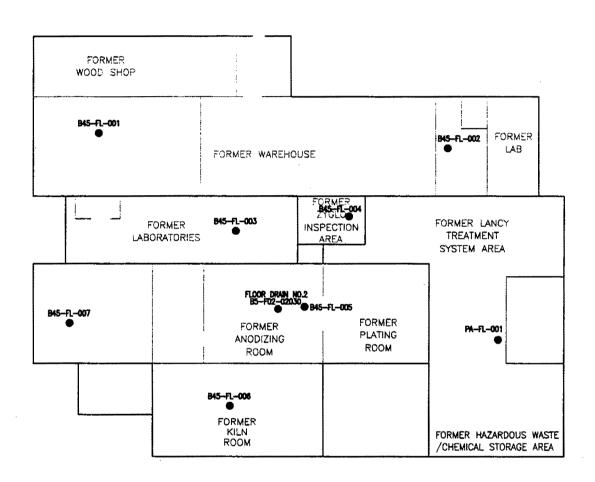




FIGURE 4-10 BUILDING 4 & 5 FLOORS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B45-FL-001 SWIPE SAMPLES

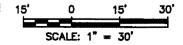
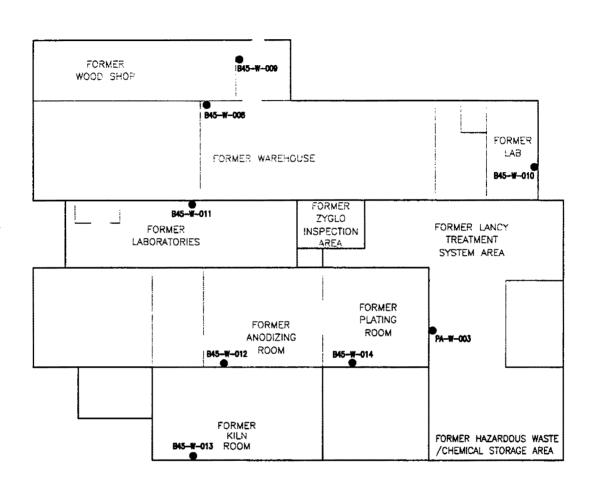




FIGURE 4-11 BUILDING 4 & 5 WALLS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B45-W-008 SWIPE SAMPLES

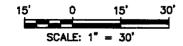
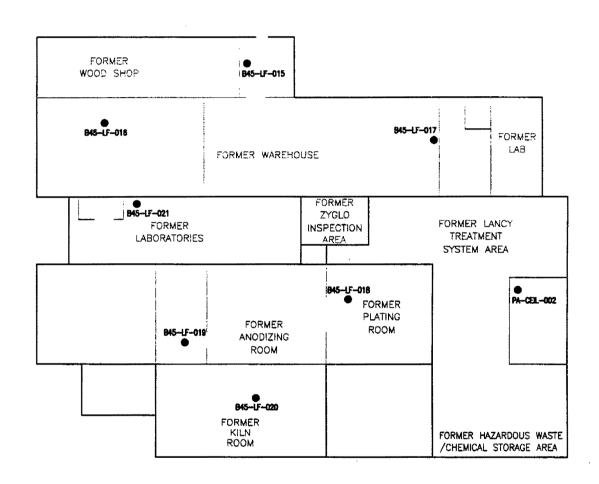




FIGURE 4-12 BUILDING 4 & 5 LIGHT FIXTURES CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B45-LF-015 SWIPE SAMPLES

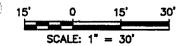
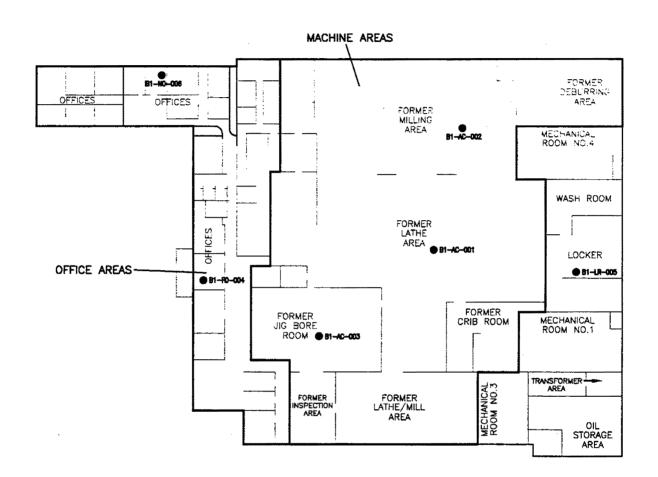


FIGURE 4-13 BUILDING 1 AIR CLEARANCE SAMPLE LOCATIONS



LEGEND

● B1-NO-006 AIR CLEARANCE SAMPLES

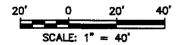
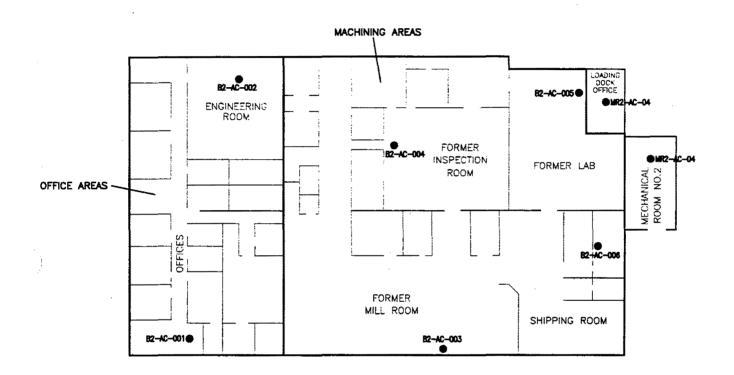


FIGURE 4-14 BUILDING 2 AIR CLEARANCE SAMPLE LOCATIONS



LEGEND

● B2-AC-001 AIR CLEARANCE SAMPLES

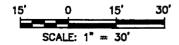
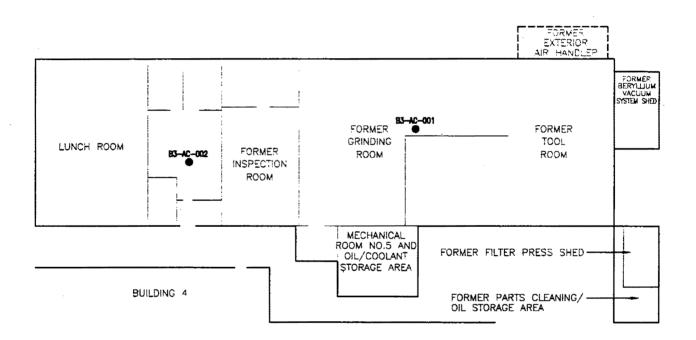


FIGURE 4-15 BUILDING 3 AIR CLEARANCE SAMPLE LOCATIONS



LEGEND

● B3-AC-001 AIR CLEARANCE SAMPLES

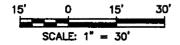
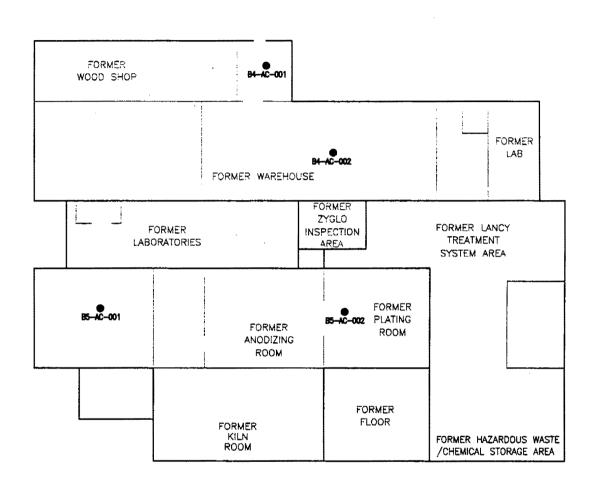




FIGURE 4-16 BUILDING 4 & 5 AIR CLEARANCE SAMPLE LOCATIONS



LEGEND

● B4-AC-001 AIR CLEARANCE SAMPLES

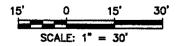


Table 4-3
Summary of Beryllium Abatement Actions and Final Surface Swipe Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Building Feature	Location	Abatement Action	No. of Samples	Beryllium Surface Wipe Concentration Range (μg/ft²)
Ceiling Tiles, grid, and fiberglass	Buildings #1 and #2	Removal	Not Applicable	Not Applicable
HVAC ductwork Air handlers	Buildings #1 and #2 Buildings #1 and #2	Removal Removal	Not Applicable Not Applicable	Not Applicable Not Applicable
Former beryllium vacuum system shed and beryllium vacuum piping	Building #3 (tub from shed) Building 4 (vacuum piping)	Removal	Not Applicable	Not Applicable
Carpeting Floors	Buildings #1 and #2 Building #1	Removal Decontamination	Not Applicable Building #1	Not Applicable Building #1
	 Machining areas Office areas Mechanical room 1 Mechanical room 3 Mechanical room 4 Locker room Oil storage area 	·	- 14 samples - 5 samples - 1 samples - 1 samples - 1 samples - 1 samples - 1 samples - 1 samples	- 0.14 - 5.3 - 0.5 - 3.6 - 21.24 - 5.35 - 17.64 - 18.76 - 0.19
	Building #2 - Machining areas - Office areas - Mechanical room 2 - Loading dock office	Decontamination	Building #2 - 9 samples - 5 samples - 1 samples - 1 samples	Building #2 - 0.34 - 13.28 - ND - 5.13 - 0.38 - 1.85
	Building #3 - Shops / offices - Be vacuum system - Filter press shed - Mechanical room 5 - Floor drain - Sump	Decontamination	Building #3 - 5 samples - 1 sample - 1 sample - 1 sample - 1 sample - 1 sample - 1 sample	Building #3 - 0.09 - 4.5 - 0.06 - ND - 1.24 - 1.18 - 1.03
	Buildings #4 and #5 - Process rooms / labs - Exterior storage area - Floor drain #2	Decontamination	Buildings #4 and #5 - 7 samples - 1 sample - 1 sample	Buildings #4 and #5 - 0.85 - 6 - ND - 1.03

Table 4-3 (continued)
Summary of Beryllium Abatement Actions and Final Surface Swipe Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Building Feature	Location	Abatement Action	No. of Samples	Beryllium Surface Wipe Concentration Range (μg/ft²)
Walls	Building #1	Decontamination	Building #1	Building #1
	 Machining areas Office areas Mechanical room 1 Mechanical room 3 Mechanical room 4 Locker room Oil storage area 		- 14 samples - 9 samples - 1 samples - 1 samples - 1 samples - 1 samples - 1 samples - 1 samples	- ND - 16.08 - 0.05 - 3.1 - 4.35 - 4.39 - 1.36 - 1.4 - 0.20
	Building #2	Decontamination	Building #2	Building #2
	 Machining areas Office areas Mechanical room 2 Loading dock office 		- 9 samples - 5 samples - 1 samples - 1 samples	- ND - 0.86 - 0.07 - 0.53 - 0.57 - 0.42
	Building #3	Decontamination	Building #3	Building #3
	- Shops / offices - Be vacuum system - Filter press shed - Mechanical room 5	7	- 8 samples - 1 sample - 1 sample - 1 sample	- ND - 1.76 - 4.7 - ND - 5.25
	Buildings #4 and #5	Decontamination	Buildings #4 and #5	Buildings #4 and #5
	- Process rooms / labs - Exterior storage area		- 7 samples - 1 sample	- 0.09 - 4.38 - 0.23
Light fixtures and	Building #1	Decontamination	Building #1	Building #1
other ceiling materials	 Machining areas Office areas Mechanical room 1 Mechanical room 3 Mechanical room 4 Locker room Oil storage area 		- 14 samples - 9 samples - 1 samples - 1 samples - 1 samples - 1 samples - 1 samples - 1 samples	- 0.05 - 8.0 - 0.05 - 3.35 - 13.08 - 5.92 - 13.72 - 6.2 - 0.10

Table 4-3 (continued)
Summary of Beryllium Abatement Actions and Final Surface Swipe Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Building Feature	Location	Abatement Action	No. of Samples	Beryllium Surface Wipe Concentration Range (μg/ft²)
Light fixtures and other ceiling materials	Building #2 - Machining areas - Office areas - Mechanical room 2 - Loading dock office	Decontamination	Building #2 - 9 samples - 5 samples - 1 samples - 1 samples	Building #2 - ND - 0.86 - 0.07 - 0.53 - 0.57 - 0.42
Light fixtures and other ceiling materials (Continued)	Building #3 - Shops / offices - Be vacuum system - Filter press shed - Mechanical room 5	Decontamination	Building #3 - 8 samples - 1 sample - 1 sample - 1 sample	Building #3 - 0.23 - 9.0 - 1.44 - 0.19 - 0.12
	Buildings #4 and #5 - Process rooms / labs - Exterior storage area	Decontamination	Buildings #4 and #5 - 8 samples - 1 sample	Buildings #4 and #5 - 0.81 - 6.6 - 1.71

ND - Not Detected.

Table 4-4
Summary of Beryllium Air Clearance Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Sample Type	Location	No. of Samples	Beryllium Air Concentration Range (mg/m³)
Air Filter Media	Building #1	6	All samples reported < 0.00005
Air Filter Media	Building #2	6	All samples reported < 0.00005
Air Filter Media	Building #3	2	All samples reported < 0.00005
Air Filter Media	Buildings #4 and #5	4	All samples reported < 0.00005

Table 4-5
Summary of Plating Ductwork Abatement Actions and Chromium Swipe Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Building Feature	Location	Abatement Action	No. of Samples	Chromium Surface Wipe Concentration Range (µg/ft²)
Plating ductwork	Building #5	Decontamination and Removal	Not Applicable	Not Applicable
Floors	Building #5 - Process rooms / labs - Exterior storage area	Decontamination	Building #5 - 5 samples - 1 sample	Building #5 - 3.32 - 64.15 - ND
Walls	Building #5 - Process rooms / labs - Exterior storage area	Decontamination	Building #5 - 4 samples - 1 sample	Building #5 - 0.16 - 3.27 - 0.3
Light fixtures and other ceiling materials	Building #5 - Process rooms / labs - Exterior storage area	Decontamination	Building #5 - 5 samples - 1 sample	Building #5 - 1.41 - 33.83 - 13.33

Section 5 Conclusions

Beryllium-impacted ceiling materials (tiles, grid, insulation), HVAC ductwork, air handlers, carpets, and Building 5 plating ductwork were removed and disposed of in accordance with appropriate federal and state disposal criteria. Clearance swipe samples collected after final decontamination and abatement activities were all less than the surface swipe criteria of 25 µg/ft². Air clearance samples reported that airborne beryllium concentrations were below OSHA's 0.002 mg/m³ PEL. Based on the results of the abatement program, all beryllium abatement objectives were achieved. With concurrence from Law Environmental, Inc., no further action is required, and all buildings are considered suitable for occupancy.

Section 4

Beryllium Abatement Program

The following section describes the technical approach, scope of work and field methodology followed to complete the decontamination and abatement of beryllium impacted materials at the ABC facility. The abatement program was implemented from December 1999 through February 2000. Abatement activities were performed in accordance with Tetra Tech's <u>Decontamination</u> and Abatement of Beryllium Impacted Materials Work Plan, Former American Beryllium Company, dated November 30, 1999.

4.1 PROJECT APPROACH

In order to facilitate property transfer, a surface wipe limit of 25 μ g/ft² was selected as a guideline for abatement to reduce the potential for airborne beryllium hazards at the former ABC facility. As described in Section 2.2, beryllium concentrations were detected above 25 μ g/ft² in building materials throughout the facility. The abatement approach was to first remove beryllium-impacted materials that could not easily be decontaminated (ceiling materials, air handlers, HVAC ductwork, and carpets). Approximately 60 linear feet of ductwork associated with former plating and anodizing lines in Building 5 were also removed. Following removal of the materials, all accessible interior building surfaces (floors, walls, light fixtures, etc.) were subsequently decontaminated to below the beryllium cleanup level of 25 μ g/ft². A summary of the abatement activities performed at the ABC facility is described in Table 4-1.

Table 4-1
Beryllium Impacted Areas and Final Abatement Actions^a

Building Feature	Location	Abatement Action
Ceiling tiles, grid, fiberglass	Buildings 1, 2, 3 office areas. and Buildings 4 and 5	Removed
Other ceiling materials (light fixtures, etc.)	Buildings 1, 2, 3, 4, and 5	Decontaminated
HVAC ductwork	Buildings 1, 2, 3, 4, and 5	Removed
Air handlers ^b	Buildings 1, 2, 3, 4, and 5	Removed
Beryllium vacuum piping	Building 4	Removed
Carpeting	Buildings 1, 2, and 3 (primarily office areas)	Removed
Walls, floors and other interior surfaces (includes floors below carpeted areas)	Buildings 1, 2, 3, 4, and 5	Decontaminated
Former Be vacuum system	Building 3, east side of building	Decontaminated
Filter press shed	Building 3	Decontaminated
Former Lancy Treatment System and hazardous waste / chemical storage area	Building 5	Decontaminated
Plating ductwork	Building 5	Removed
Sumps / Floor drains	Buildings 3 and 5	Decontaminated

a – Abatement activities focused on beryllium. However, decontamination activities in the Building #5 plating areas were also intended to remove chromium residues.

Following abatement activities, clearance sampling was performed to document that the beryllium abatement objectives had been attained. Both surface wipe and air clearance samples were collected and compared to site-specific clearance criteria.

b - Roof units were not removed.

4.2 FIELD METHODOLOGY

A description of each major task associated with the abatement program is presented in the following subsections:

4.2.1 Work Area Preparation and Isolation

Prior to disturbance of impacted materials, a work enclosure and decontamination facility was installed at each work area. The enclosure consisted of a single layer of polyethylene on all walls and floors designated for decontamination and abatement. A negative air chamber containing a HEPA filter system was installed within each work area to prevent particulate migration to areas outside the enclosure. This system remained in operation until final clearance samples were collected to document that no airborne beryllium hazards were present.

A decontamination facility was located at the egress point of the work area. All personnel and equipment within the work area were decontaminated prior to egress. A waste load out area was constructed for the decontamination and load out of beryllium waste packages prior to disposal.

4.2.2 Removal and Decontamination of Beryllium Impacted Materials

All beryllium impacted ceiling tiles (includes grid and insulation), vacuum piping, HVAC ductwork, air handlers, and carpets were removed from the former ABC facility. Ductwork from the Building 5 plating area was also removed. Prior to and during bulk removal, the materials were misted with an encapsulant to prevent airborne dust emissions. The materials were packaged (single bagged in six-millimeter thick polyethylene) and stored in a storage bin in preparation for disposal.

Following removal of bulk materials, the interior surface areas (walls, floors, ceiling materials, sumps and floor drains) were decontaminated using pressure wash and wipe down methods. All surface areas were decontaminated to the beryllium action level of 25 μ g/ft². Decontamination

water was collected and stored in a storage tank pending disposal. The tank was also used to store decontamination water generated from PPE cleaning.

4.2.3 Perimeter Air Monitoring during Abatement

During abatement and decontamination activities, perimeter air samples were collected to ensure and document that no fugitive beryllium emissions were released outside the containment area. The samples were collected using personal air sampling pumps that flowed at 3 liters per minute. Two perimeter air samples were collected during each work day; one sample was collected at the entrance to the work enclosure area; and one sample was collected at the HEPA filter exhaust. All perimeter air samples were analyzed for beryllium using either NIOSH Method 7300 or USEPA Method 6010A.

4.2.4 Clearance Wipe Sampling

Following decontamination of the building surfaces, clearance wipe samples were collected to ensure that the action level of $25 \,\mu\text{g/ft}^2$ had been attained. When a swipe sample exceeded the $25 \,\mu\text{g/ft}^2$ cleanup level, the surrounding area out to the nearest clean sampling point was recleaned. The area was then resampled to confirm that cleanup standards were attained.

Representative samples were collected from each area and material type that was decontaminated. Sample frequencies and locations in the major buildings (Buildings 1, 2, 3, 4, and 5) were determined using the following general methodology for each material type. For walls and floors, 8 samples were collected per 100 ft. x 100-ft. area (total 10,000-ft² area). For ceiling light fixtures, samples were collected at a rate of 8 per 100 fixtures (8% of the total fixtures counted at the facility). Samples were also collected from miscellaneous areas with different material types. Samples were collected throughout the buildings to provide adequate geographic coverage for each material type. Figures 4-1 through 4-12 present the surface wipe sampling locations. A summary of the clearance sampling counts for each building is provided below:

Building 1 clearance samples

- 1. Floor samples Building 1 contains approximately 18,000 ft² of floors in the former machining areas, and 4,500 ft² in the former office areas. Based on the estimated square footage, 14 clearance samples were collected from the former machining areas and 5 were collected from the former office areas see Figure 4-1.
- 2. Wall samples Building 1 contains approximately 13,685 ft² of walls in the former machining areas, and 16,500 ft² in the former office areas. Based on the estimated square footage, 14 clearance samples were collected from the former machining areas and 10 were collected from the former office areas see Figure 4-2.
- Ceiling light fixture samples Building 1 contains approximately 268 light fixtures.
 Based on the estimated light fixture count, 18 clearance samples were collected from Building 1 (9 from the former machining areas and 9 from the former office areas)
 see Figure 4-3.
- 4. <u>Samples from miscellaneous areas</u> Additional rooms and areas sampled in Building 1 include Mechanical Room #1, Mechanical Room #3, Mechanical Room #4, the locker room, and the oil storage area. Three samples (1 floor, 1 wall, and 1 light fixture) were collected from each of these rooms see Figures 4-1 through 4-3.

Building 2 clearance samples

- Floor samples Building 2 contains approximately 11,000 ft² of floors in the former machining areas, and 5,250 ft² in the former office and engineering areas. Based on the estimated square footage, 9 clearance samples were collected from the former machining areas and 5 were collected from the former office and engineering areas see Figure 4-4.
- 2. Wall samples Building 2 contains approximately 19,950 ft² of walls in the former machining areas, and 8,200 ft² in the former office and engineering areas. Based on the

- estimated square footage, 17 clearance samples were collected from the former machining areas and 7 were collected from the former office and engineering areas see Figure 4-5.
- 3. Ceiling light fixture samples Building 2 contains approximately 158 light fixtures in the former machining areas, and 107 light fixtures in the former office and engineering areas. Based on the estimated light fixture count, 12 clearance samples were collected from the former machining areas and 9 were collected from the former office and engineering areas see Figure 4-6.
- 4. <u>Samples from miscellaneous areas</u> Additional rooms and areas sampled in Building 2 include Mechanical Room #2 and the former loading dock office. Three samples (1 floor, 1 wall, and 1 light fixture) were collected from each of these rooms see Figures 4-4 through 4-6.

Building 3 clearance samples

- Floor samples Building 3 contains approximately 6,000 ft² of floors in the former machining and office areas. Based on the estimated square footage, 5 clearance samples were collected from the machining and office areas. A wipe sample was also collected from a floor drain and a sump in the building see Figure 4-7.
- Wall samples Building 3 contains approximately 9,645 ft² of walls in the former machining and office areas. Based on the estimated square footage, 8 clearance samples were collected from the machining and office areas see Figure 4-8.
- 3. Ceiling light fixture samples Building 3 contains approximately 89 light fixtures in the former machining and office areas. Based on the estimated light fixture count, 8 clearance samples were collected from the former machining and office areas see Figure 4-9.
- 4. <u>Samples from miscellaneous areas</u> Additional rooms and areas sampled in Building 3 include Mechanical Room #5 (also referred to as oil/coolant storage room), a former

filter press shed, and a former beryllium vacuum system shed. Three samples (1 floor, 1 wall, and 1 light fixture) were collected from each of these rooms - see Figures 4-7 through 4-9.

Buildings 4 and 5 clearance samples

- Floor samples Buildings 4 and 5 contains approximately 8,085 ft² of floors in the former laboratory and process areas. Based on the estimated square footage, 7 clearance samples were collected from the former laboratory and process areas. A wipe sample was also collected from a floor drain in Building 5 see Figure 4-10.
- 2. <u>Wall samples</u> Buildings 4 and 5 contain approximately 8,305 ft² of walls in the former laboratory and process areas. Based on the estimated square footage, 7 clearance samples were collected from the machining and office areas see Figure 4-11.
- 3. Ceiling light fixture samples Buildings 4 and 5 contain approximately 100 light fixtures in the former laboratory and process areas. Based on the estimated light fixture count, 8 clearance samples were collected from the former laboratory and process areas see Figure 4-12.
- 4. <u>Samples from miscellaneous areas</u> Additional rooms and areas sampled in Buildings 4 and 5 include the former treatment system and chemical storage area located east of the building. Three samples (1 floor, 1 wall, and 1 light fixture) were collected from this area see Figures 4-10 through 4-12.

The clearance swipe samples were collected using laboratory supplied wipe media templates. A 12-inch by 12-inch area was first outlined on the sampled surface. The samples were then collected by applying an "S" shaped motion once with its entire surface and then again in the opposite direction with a half-folded surface. Each wipe sample was then folded once more and placed in separate vial containers. Disposable surgical gloves were used to prevent cross

contamination of the samples. The samples were analyzed for beryllium using EPA Method 6010A. The chromium samples were analyzed using EPA Method 6010A.

4.2.5 Clearance Air Sampling

Clearance air samples were collected from each building to ensure that no airborne beryllium hazards exist following decontamination. The samples were collected using personal air sampling pumps that flowed at approximately 3 liters per minute. The samples were collected at positions ranging from 4 to 6 feet above ground surface to simulate the breathing zone of future facility occupants. The following number of clearance samples were collected from each building:

Table 4-2
Summary of Air Clearance Samples

Building Number	Number of Air Samples
1	6
2	6
3	2
4	. 2
5	2

Sampling pumps were calibrated before and after the sampling events. The air samples were analyzed for beryllium using NIOSH Method 7300 or USEPA Method 6010A. Air clearance sample locations are shown on Figures 4-13 through 4-16.

4.2.6 Disposal of Beryllium Impacted Materials

The beryllium impacted bulk materials and wastewater were disposed of in accordance with applicable CFR and FAC waste classification criteria. As outlined in Section 3.3, the beryllium residues on the bulk materials do not meet the definition of a characteristic or listed hazardous waste and were therefore not disposed of as a hazardous waste. The bulk materials were transported to the Manatee County landfill.

As outlined in Section 3.3, the decontamination water was also determined to be non-hazardous. The decontamination water was therefore transported as a non-hazardous waste to Clark Environmental's permitted treatment and recycling facility located in Mulberry, Florida.

4.2.7 Removal and Disposal of Chromium Impacted Plating Ductwork

Approximately 60 linear feet of ductwork associated with former plating and anodizing lines in Building 5 and the former treatment storage area were removed. Prior to disposal, the ductwork was cut into sections and then decontaminated to remove visible residues and stains. To determine if the materials were a hazardous waste, a bulk sample was collected from the ductwork and analyzed for chromium using the TCLP method. The sample reported a concentration of 2.5 mg/L of chromium, which is below the chromium toxicity criterion of 5 mg/L. The bulk materials were subsequently transported as a non-hazardous waste to the Manatee County landfill.

Following removal of the ductwork from Building 5 and the former treatment storage area, the interior surfaces (walls, floors, ceilings) were decontaminated in accordance with the methods prescribed in Section 4.2.2. Surface wipe samples were collected from the building surfaces to document post-decontamination chromium concentrations. No wipe sample criteria were identified for chromium.

4.3 SUMMARY OF ANALYTICAL DATA

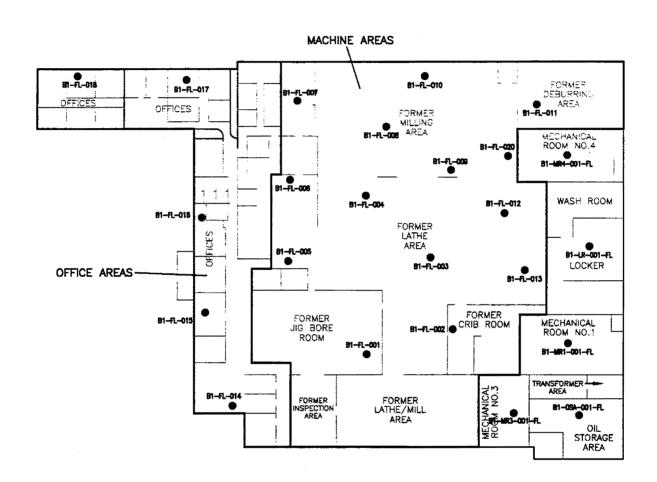
4.3.1 Surface Wipe Sampling Data

Surface wipe samples were collected during and after abatement to document that the site-specific beryllium cleanup standard of $25\mu g/ft^2$ was attained. All final clearance samples show that the surface cleaning standards have been attained. Copies of the laboratory data reports are presented in Appendix A. A summary of the final beryllium clearance data is presented in Table 4-3 on pages 4-27 to 4-29. A summary of the chromium surface wipe data is presented in Table 4-4 on page 4-30.

4.3.2 Air Clearance Sampling Data

Air clearance samples were collected after abatement to document that airborne beryllium concentrations within the buildings did not exceed OSHA's 0.002 mg/m³ PEL. All air clearance samples did not report concentrations above the detection limit of 0.00005 mg/m³. Copies of the laboratory data reports are presented in Appendix A. A summary of the final clearance data is presented in Table 4-4 on page 4-29.

FIGURE 4-1 BUILDING 1 FLOORS CLEARANCE WIPE SAMPLE LOCATIONS

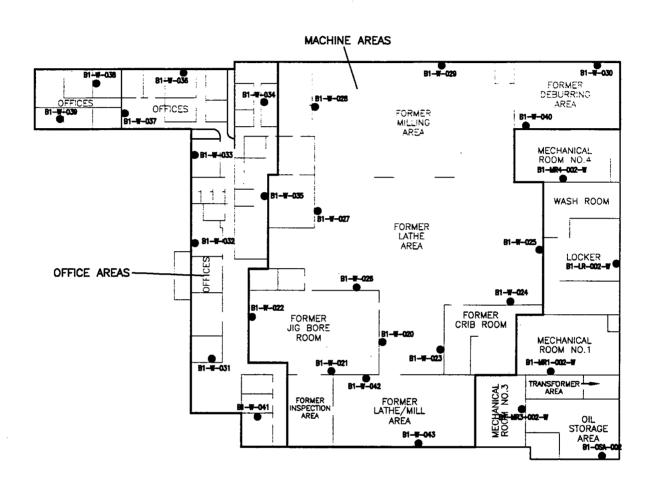


LEGEND

● B1-FL-001 SWIPE SAMPLES



FIGURE 4-2 BUILDING 1 WALLS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B1-W-021 SWIPE SAMPLES

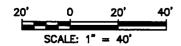
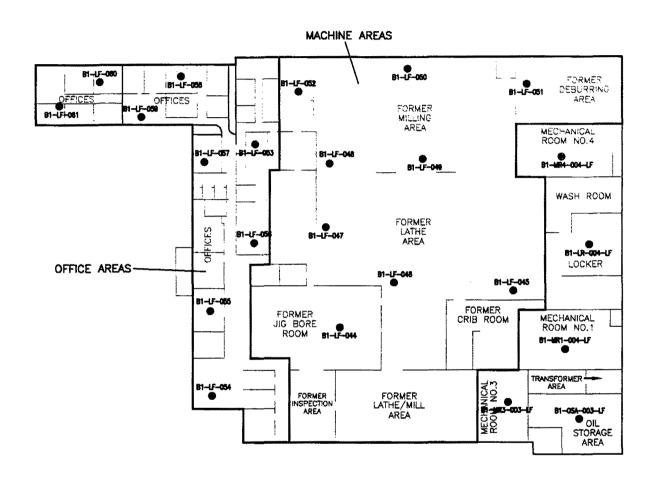




FIGURE 4-3 BUILDING 1 LIGHT FIXTURES CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B1-LF-044 SWIPE SAMPLES

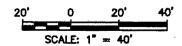
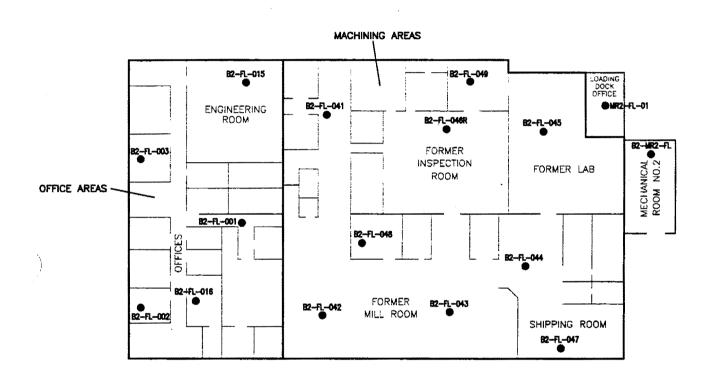




FIGURE 4-4 BUILDING 2 FLOORS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B2-FL-042 SWIPE SAMPLES

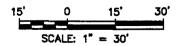
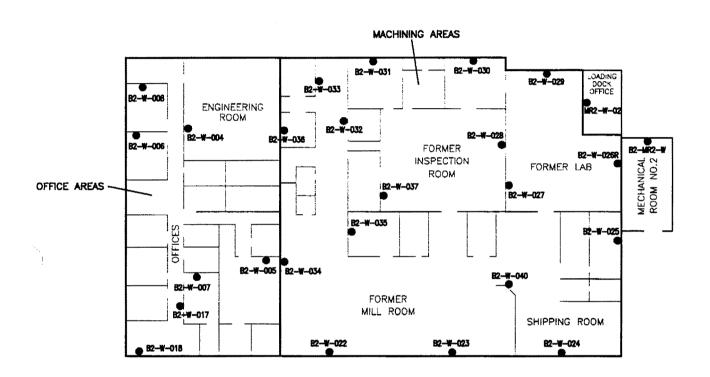


FIGURE 4-5 BUILDING 1 WALLS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B2-W-022 SWIPE SAMPLES

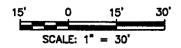
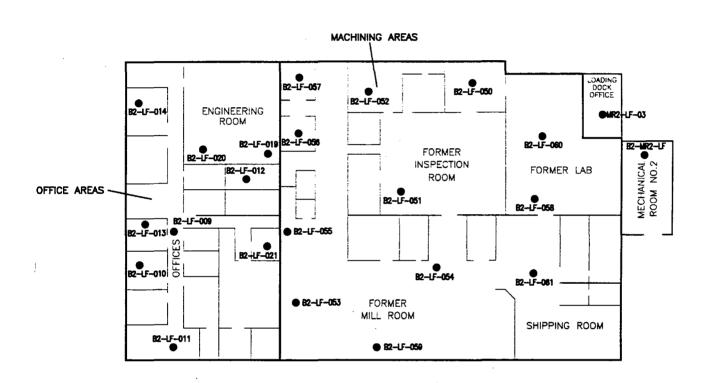


FIGURE 4-6 BUILDING 2 LIGHT FIXTURES CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B2-LF-051 SWIPE SAMPLES

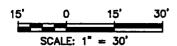
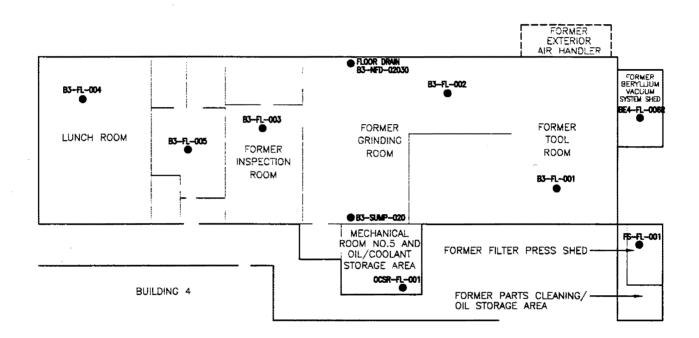




FIGURE 4-7 BUILDING 3 FLOORS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B3-FL-001 SWIPE SAMPLES

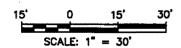
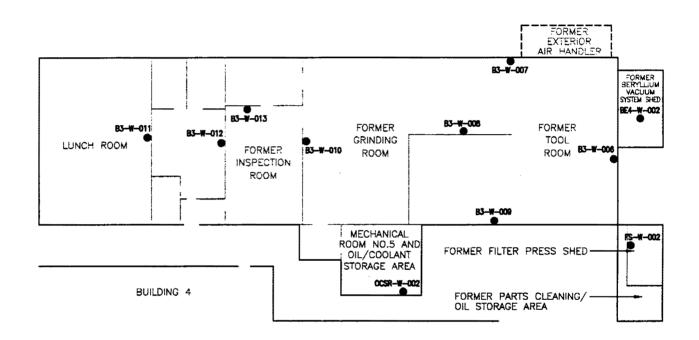


FIGURE 4-8 BUILDING 3 WALLS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

■ B3-W-006 SWIPE SAMPLES

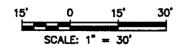
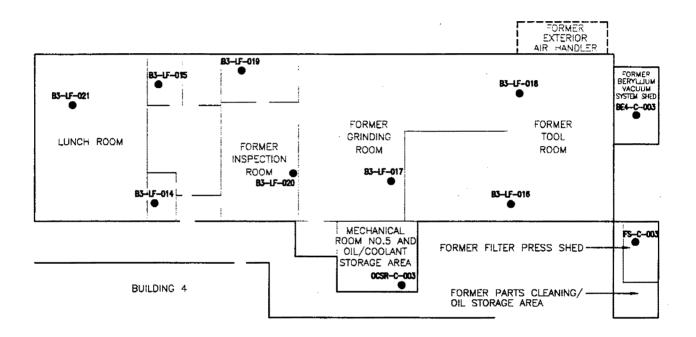




FIGURE 4-9 BUILDING 3 LIGHT FIXTURES CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B3-LF-014 SWIPE SAMPLES

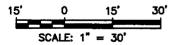
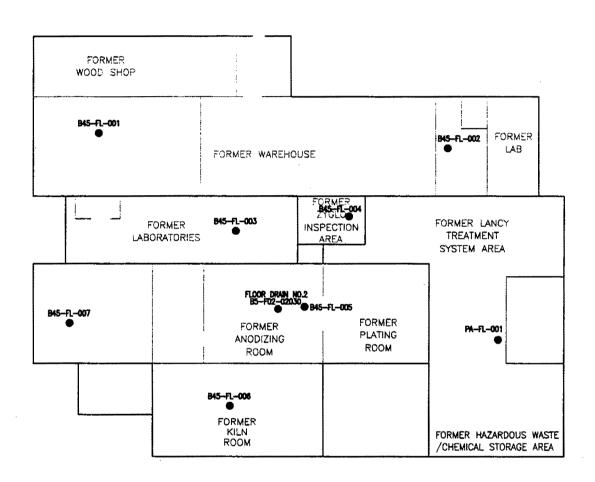




FIGURE 4-10 BUILDING 4 & 5 FLOORS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B45-FL-001 SWIPE SAMPLES

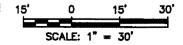
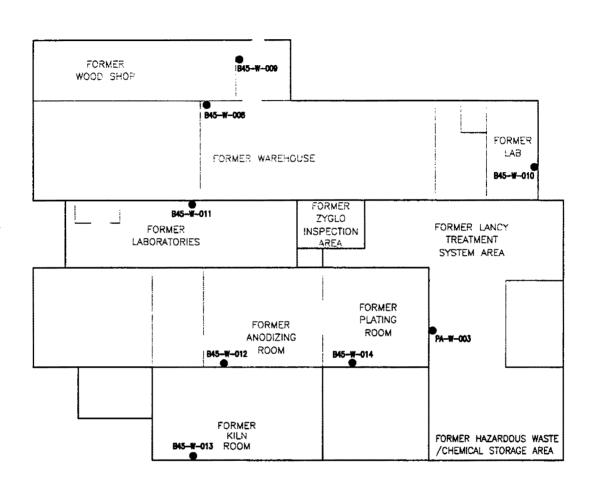




FIGURE 4-11 BUILDING 4 & 5 WALLS CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B45-W-008 SWIPE SAMPLES

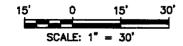
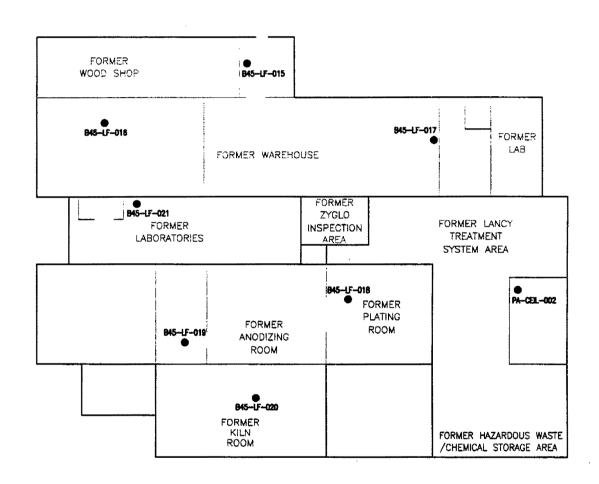




FIGURE 4-12 BUILDING 4 & 5 LIGHT FIXTURES CLEARANCE WIPE SAMPLE LOCATIONS



LEGEND

● B45-LF-015 SWIPE SAMPLES

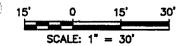
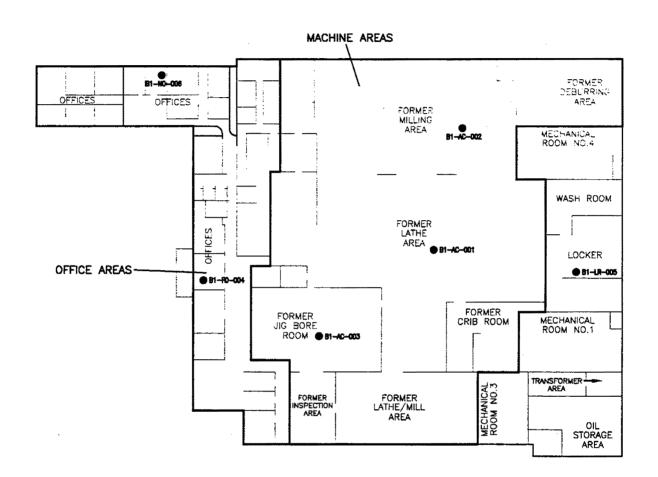


FIGURE 4-13 BUILDING 1 AIR CLEARANCE SAMPLE LOCATIONS



LEGEND

● B1-NO-006 AIR CLEARANCE SAMPLES

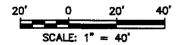
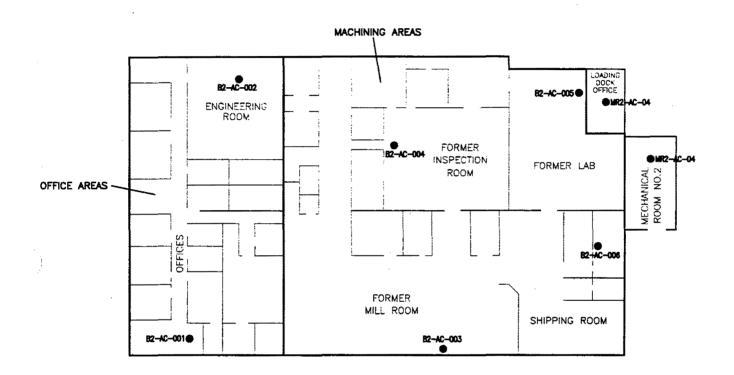


FIGURE 4-14 BUILDING 2 AIR CLEARANCE SAMPLE LOCATIONS



LEGEND

● B2-AC-001 AIR CLEARANCE SAMPLES

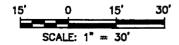
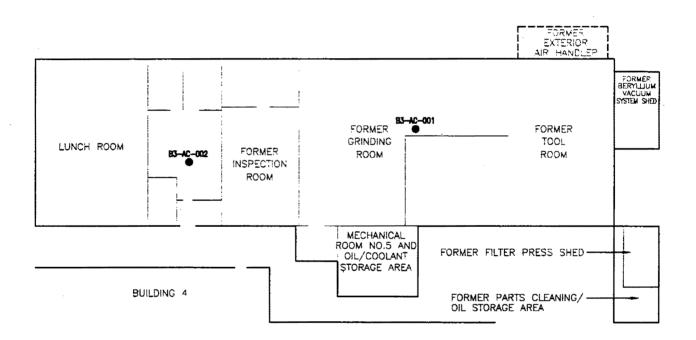


FIGURE 4-15 BUILDING 3 AIR CLEARANCE SAMPLE LOCATIONS



LEGEND

● B3-AC-001 AIR CLEARANCE SAMPLES

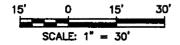
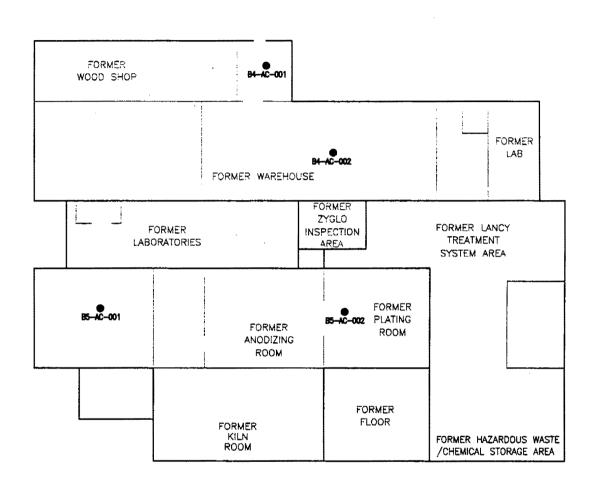




FIGURE 4-16 BUILDING 4 & 5 AIR CLEARANCE SAMPLE LOCATIONS



LEGEND

● B4-AC-001 AIR CLEARANCE SAMPLES

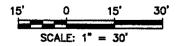


Table 4-3
Summary of Beryllium Abatement Actions and Final Surface Swipe Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Building Feature	Location	Abatement Action	No. of Samples	Beryllium Surface Wipe Concentration Range (μg/ft²)
Ceiling Tiles, grid, and fiberglass	Buildings #1 and #2	Removal	Not Applicable	Not Applicable
HVAC ductwork Air handlers	Buildings #1 and #2 Buildings #1 and #2	Removal Removal	Not Applicable Not Applicable	Not Applicable Not Applicable
Former beryllium vacuum system shed and beryllium vacuum piping	Building #3 (tub from shed) Building 4 (vacuum piping)	Removal	Not Applicable	Not Applicable
Carpeting Floors	Buildings #1 and #2 Building #1	Removal Decontamination	Not Applicable Building #1	Not Applicable Building #1
	 Machining areas Office areas Mechanical room 1 Mechanical room 3 Mechanical room 4 Locker room Oil storage area 	·	- 14 samples - 5 samples - 1 samples - 1 samples - 1 samples - 1 samples - 1 samples - 1 samples	- 0.14 - 5.3 - 0.5 - 3.6 - 21.24 - 5.35 - 17.64 - 18.76 - 0.19
	Building #2 - Machining areas - Office areas - Mechanical room 2 - Loading dock office	Decontamination	Building #2 - 9 samples - 5 samples - 1 samples - 1 samples	Building #2 - 0.34 - 13.28 - ND - 5.13 - 0.38 - 1.85
	Building #3 - Shops / offices - Be vacuum system - Filter press shed - Mechanical room 5 - Floor drain - Sump	Decontamination	Building #3 - 5 samples - 1 sample - 1 sample - 1 sample - 1 sample - 1 sample - 1 sample	Building #3 - 0.09 - 4.5 - 0.06 - ND - 1.24 - 1.18 - 1.03
	Buildings #4 and #5 - Process rooms / labs - Exterior storage area - Floor drain #2	Decontamination	Buildings #4 and #5 - 7 samples - 1 sample - 1 sample	Buildings #4 and #5 - 0.85 - 6 - ND - 1.03

Table 4-3 (continued)
Summary of Beryllium Abatement Actions and Final Surface Swipe Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Building Feature	Location	Abatement Action	No. of Samples	Beryllium Surface Wipe Concentration Range (μg/ft²)
Walls	Building #1	Decontamination	Building #1	Building #1
	 Machining areas Office areas Mechanical room 1 Mechanical room 3 Mechanical room 4 Locker room Oil storage area 		- 14 samples - 9 samples - 1 samples - 1 samples - 1 samples - 1 samples - 1 samples - 1 samples	- ND - 16.08 - 0.05 - 3.1 - 4.35 - 4.39 - 1.36 - 1.4 - 0.20
	Building #2	Decontamination	Building #2	Building #2
	 Machining areas Office areas Mechanical room 2 Loading dock office 		- 9 samples - 5 samples - 1 samples - 1 samples	- ND - 0.86 - 0.07 - 0.53 - 0.57 - 0.42
	Building #3	Decontamination	Building #3	Building #3
	- Shops / offices - Be vacuum system - Filter press shed - Mechanical room 5	7	- 8 samples - 1 sample - 1 sample - 1 sample	- ND - 1.76 - 4.7 - ND - 5.25
	Buildings #4 and #5	Decontamination	Buildings #4 and #5	Buildings #4 and #5
	- Process rooms / labs - Exterior storage area		- 7 samples - 1 sample	- 0.09 - 4.38 - 0.23
Light fixtures and	· -		Building #1	Building #1
other ceiling materials	 Machining areas Office areas Mechanical room 1 Mechanical room 3 Mechanical room 4 Locker room Oil storage area 		- 14 samples - 9 samples - 1 samples - 1 samples - 1 samples - 1 samples - 1 samples - 1 samples	- 0.05 - 8.0 - 0.05 - 3.35 - 13.08 - 5.92 - 13.72 - 6.2 - 0.10

Table 4-3 (continued)
Summary of Beryllium Abatement Actions and Final Surface Swipe Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Building Feature	Location	Abatement Action	No. of Samples	Beryllium Surface Wipe Concentration Range (μg/ft²)
Light fixtures and other ceiling materials	Building #2 - Machining areas - Office areas - Mechanical room 2 - Loading dock office	Decontamination	Building #2 - 9 samples - 5 samples - 1 samples - 1 samples	Building #2 - ND - 0.86 - 0.07 - 0.53 - 0.57 - 0.42
Light fixtures and other ceiling materials (Continued)	Building #3 - Shops / offices - Be vacuum system - Filter press shed - Mechanical room 5	Decontamination	Building #3 - 8 samples - 1 sample - 1 sample - 1 sample	Building #3 - 0.23 - 9.0 - 1.44 - 0.19 - 0.12
	Buildings #4 and #5 - Process rooms / labs - Exterior storage area	Decontamination	Buildings #4 and #5 - 8 samples - 1 sample	Buildings #4 and #5 - 0.81 - 6.6 - 1.71

ND - Not Detected.

Table 4-4
Summary of Beryllium Air Clearance Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Sample Type	Location	No. of Samples	Beryllium Air Concentration Range (mg/m³)
Air Filter Media	Building #1	6	All samples reported < 0.00005
Air Filter Media	Building #2	6	All samples reported < 0.00005
Air Filter Media	Building #3	2	All samples reported < 0.00005
Air Filter Media	Buildings #4 and #5	4	All samples reported < 0.00005

Table 4-5
Summary of Plating Ductwork Abatement Actions and Chromium Swipe Sampling Results
Former American Beryllium Company Facility, Tallevast, Florida

Building Feature	Location	Abatement Action	No. of Samples	Chromium Surface Wipe Concentration Range (µg/ft²)
Plating ductwork	Building #5	Decontamination and Removal	Not Applicable	Not Applicable
Floors	Building #5 - Process rooms / labs - Exterior storage area	Decontamination	Building #5 - 5 samples - 1 sample	Building #5 - 3.32 - 64.15 - ND
Walls	Building #5 - Process rooms / labs - Exterior storage area	Decontamination	Building #5 - 4 samples - 1 sample	Building #5 - 0.16 - 3.27 - 0.3
Light fixtures and other ceiling materials	Building #5 - Process rooms / labs - Exterior storage area	Decontamination	Building #5 - 5 samples - 1 sample	Building #5 - 1.41 - 33.83 - 13.33