

Appendix A:

Implementation Plan

for the

Upgrade of the Heated Tube Facility, Building 109

97-028

November 3, 2004

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Working Hours:

NASA Glenn Research Center (GRC) standard working hours shall be defined as eight (8) hour days, Monday through Friday, between the hours of 7:00 am to 3:30 pm.

Second shift hours at GRC shall be defined as eight (8) hour days, Monday through Friday, between the hours of 4:00 pm to midnight. Weekend hours shall be defined as Saturday through Monday, between the hours of 12:00 am Saturday to 6:00 am Monday.

Notices to Proceed:

The construction contract shall be structured with two Notices to Proceed (NTP). These shall be issued as follows:

Initial Notice to Proceed

This NTP shall commence all required submittals (equipment, schedules, health & safety plans, etc.). After this NTP, and before the Contractor submits a detailed construction schedule, a meeting shall be held between the Contractor, the NASA Construction Manager (CM), Project Manager (PM), Facility Manager, and Building Manager. This meeting will discuss the coordination and implementation of construction and the coordination of contractor personnel. Contractor shall identify any long lead items and their impact on project implementation. Contractor shall then incorporate this information into the construction schedule and submit the detailed schedule to the CM for approval.

Second Notice to Proceed

This NTP shall commence actual site construction (field work). The timing between the Initial and Second NTP shall be approximately three (3) months. In order to obtain this NTP, all materials and equipment (other than long lead items) shall be on-site. The Contractor shall have approved submittals on major (long lead) equipment and evidence that material and equipment have been procured (invoices, manufacturing dates, etc.). The site-specific health and safety plan (HASP) shall be reviewed and approved (signed) by the Environmental Management Office (EMO) and the Glenn Safety Office (GSO). The construction schedule, submittal schedule, and schedule of values shall be approved prior to the NTP for construction.

Construction Schedule:

The attached preliminary construction schedule (Figure 1) shows the approximate dates suggested for construction activities. The schedule is based on the base bid scope of work and all options. The actual schedule is dependent upon the actual date of Construction Notice to Proceed(s), the Contract Period, and the Construction Progress Schedule submitted by the Contractor and approved by the COTR.

The period of performance for completion of the work under the Base Bid Contract is

343 calendar days from First NTP. The performance period for Base Bid site work (Second NTP to the completion of work) shall not exceed 253 calendar days. The performance period shall be extended as follows if any of the options are accepted:

- Option #1 (Interior Painting): +7 calendar days
- Option #2 (Exterior Painting): +7 calendar days
- Option #3 (Cable Tray): +7 calendar days
- Option #4 (Control Consoles): +7 calendar days
- Option #5 (Power Supply System): +14 calendar days
- Option #6 (CCTV System): +0 calendar days
- Option #7 (Large Volume Liquid Flow Loop): +28 calendar days
- Option #8 (GN2 System): +7 calendar days
- Option #9 (GHe System): +7 calendar days
- Option #10 (Vacuum System): +7 calendar days
- Option #11 (Process Fuels System): +21 calendar days

Therefore, if all of the Options are awarded, the period of performance for completion of the work under the Base Bid and Option Contract is 455 calendar days from First NTP. The performance period for Base Bid and Option site work (Second NTP to the completion of work) shall not exceed 365 calendar days.

Contractor shall submit a detailed construction schedule to the COTR for approval as described in Specification Section 01330. This schedule shall display the sequence of work, coordination and implementation issues, and shall identify all utility outages. It shall identify work areas and rooms where work is to be performed. As work progresses, the schedule shall be updated weekly and provided at the weekly construction meetings.

General:

Contractor shall note that special FAA approval is required for all crane boom heights in excess of the 55 feet (due to NASA's proximity to Cleveland Hopkins Airport). The approval takes approximately three (3) months to process. The approval shall be coordinated with the CM.

Building 109 and Building 51 will be occupied during construction. This project shall be constructed in a manner that will minimize the disturbance of building occupants and their work. The Contractor shall coordinate all activities with the building occupants through the CM. The facility occupants and equipment shall be protected from weather and the elements at all times during the project. The building shall be adequately sealed at the end of each workday. Roof work shall be performed under favorable weather conditions and all precautions shall be taken to insure no personnel or equipment is injured from overhead or roof work. Contractor shall be fully liable for all replacement costs of property damaged during construction.

All work, with the exception of utility shutdowns, shall be performed during standard working hours. Utility shutdowns, tie-ins and other non-routine activities shall be performed as indicated in the "Sequence of Work" section of this document, and as

directed by the CM. All work shall be coordinated such that disturbances to building occupants and their work are minimized.

Contractor is responsible for protecting all equipment, floors, walls, etc. in areas of work. Contractor shall be responsible for cleanup of dust and debris at the conclusion of each working day.

During the entire course of construction, existing building emergency exits and means of egress shall be maintained. Contractor shall coordinate with CM if emergency exits and means of egress are to be blocked for any reason.

The project will impact hazardous materials. The hazardous materials shall be abated or removed as described in the drawings, specifications, and this document (see “Environmental” portion of “Special Issues” section). The abatement/removal of the hazardous materials shall be planned so as to minimize the disturbance and handling of said materials.

Contacts:

The Contractor shall be furnished with instructions on who and how to make contact for site access, safety response, shutdown coordination, etc. This information will be made available at the pre-construction conference.

Sequence of Work:

Contractors shall submit a detailed schedule indicating sequence of work. Work shall be sequenced to take advantage of favorable seasonal conditions and include factors such as material deliveries, holidays, and other known conditions. Work shall be sequenced to minimize impact to the facility users in both Building 109 and Building 51.

On site permits for utility outages and connections:

Work shall be scheduled to hold outages to a minimum.

Utility outages and connections required during the progression of work that affect existing systems shall be arranged at the convenience of the Government and shall be scheduled outside the standard working hours or on weekends. Contractors shall not be entitled to additional payment for work performed outside standard working hours for utility connections, service connections, tie-ins, etc.

Requests for utility outages and connections shall be made in writing to the CM at least 15 working days in advance of the time required. Each request shall state the system involved, area involved, approximate duration of outage, time and date of outage requested, and the nature of work involved.

Special Issues:

General:

There is Government-furnished equipment (GFE) to be installed in this project. This equipment is listed in Appendix B (CP Sheets) and Appendix C (Instrument Index) of the specifications. The power supply (PWS301) is immediately available and is located in adjacent Building 35-10. The availability of all other GFE shall be scheduled. A meeting shall be held with the Contractor, CM, PM, Building Manager, and research customer at least sixty (60) days in advance of need to schedule the availability of the GFE. The GFE will be disassembled and made available for relocation (from Building 51) by the research customer. Rigging, transport (from Building 51), and installation shall be provided by the Contractor.

The Heated Tube Facility is currently an operational research facility in Building 51 with an active testing schedule. The construction of this project shall be implemented such that the facility can remain active in Building 51 for as long as possible. Therefore, the need for GFE shall be delayed as long as possible in the construction schedule.

The research customer will be actively working within the project work limits for the last several months of the construction activities. Extremely close interaction and scheduling with the Building Manager and CM shall be required to coordinate work during this period. The Contractor shall coordinate specific work areas with the Building Manager and CM at least once a week. The Government shall not be responsible for delays caused by improper and untimely scheduling of work activities. The Contractor shall adequately protect the research customer's equipment such that it is not damaged by construction activities. The Contractor shall be fully liable for all replacement costs for damaged equipment.

Due to longevity tests being performed in the Building 51 laboratories, all areas in Building 51 shall be considered critical areas whose shutdown times shall be scheduled and minimized. In order to ensure this, the Contractor shall coordinate all work associated with Building 51 that will cause these areas to be shutdown. The Contractor shall schedule shutdowns associated with Building 51 with the CM at least thirty (30) days in advance.

Access to adjacent Building 136 shall be maintained as much as possible during the construction activities. If access will be impacted, such as during paving activities, it shall be coordinated at least two weeks in advance.

Civil:

There is an existing monitoring well in the paved area in front of Building 109. In addition to constructing a concrete pad for permanent protection of the monitoring well, the Contractor shall protect the existing groundwater monitoring well from

damage during construction activities. If the well is damaged, the Contractor shall be responsible for permanent removal of the well per all Ohio Environmental Protection Agency procedures.

The NASA security fence will need to be accessed during the installation of the storm sewer and connection to the existing catch basin. The CM shall be notified at least seven working days prior to impacting the fence so that security can be coordinated. The Contractor shall cut the fabric, and roll it back at the beginning of each day's activities, and secure it back to the posts whenever the site is not manned. At the completion of the work, the Contractor shall permanently secure the fabric to the posts. The Contractor shall prevent unauthorized personnel from entering through the fence whenever it is open.

The Contractor shall coordinate with the CM at least two weeks before impacting access to any buildings, roads, or parking areas (for example, during paving activities and during installation of underground utilities). Signage and barricades shall comply with the Ohio Manual of Uniform Traffic Control Devices. Pedestrian access to Buildings 109 and 136 shall be maintained.

Contractor storage/laydown area shall be as shown in Figure 2. Contractor shall maintain access to the gas storage vessel on the southeast corner of Building. 51 as shown in Figure 2. Contractor shall place additional barricades to the east and south of the existing gas storage vessel to prevent possible collision. Construction machinery shall NOT utilize the Building 109 canopy area as a pathway under any circumstances.

Mechanical:

The area domestic water system shall NOT be shutdown in order to tie-in the new Building 109 domestic water line. The tie-in shall be performed utilizing a "hot tap." The Contractor shall submit product and installation procedures to ensure that the existing water line will remain operational during the installation of the new water line.

This project involves the relocation of the existing chiller CH-1 that serves the existing air handlers located in the Control Room 100. Upon completion of the installation, a complete system start-up and test, including the relocated chiller and existing air handlers, shall be performed to verify the operation of the complete system, not just the chiller alone. This test shall be witnessed by the NASA project mechanical engineer, CM, and COTR.

Electrical:

The Contractor shall follow all NASA GRC High and Low Voltage Electrical Power System Operating Instructions. This shall be indicated in the Contractor's Site Specific Health and Safety Plan. Copies of these documents can be obtained from the

CM upon request.

The electrical shutdowns associated with the relocation of panels F01 and P01 shall be minimized. New and relocated/extended branch circuits and feeders shall be installed as much as possible prior to de-energizing panelboards.

Since Building 109 will be without power for a period of time during panel relocations, the Contractor shall be responsible for providing temporary power (via generators, etc.) as necessary during shutdown periods. The amount of power does not have to equal the full building power, but shall be sufficient to supply the Contractor's needs and to supply critical building loads. Temporary power circuits shall be provided to the following equipment during all shutdown periods:

- Building 109 high voltage transformer heaters
- Building 109 safety systems (fire alarm, combustible gas detection systems)
- Building 109 EMCS/PPSS panel.

Communications shall be maintained between the Building 109 safety systems and the Building 14 Dispatch Office at all times.

Electrical contractor shall confirm that the ground system for the new distribution system is installed per the drawings and the 2002 NEC. Particular attention shall be given to the location of the main bonding jumper, grounding electrode connection, and equipment grounding connections. Installation shall be approved by the COTR prior to energizing equipment.

This project includes relocating the main 480V panelboard F01 and installing a new feeder to this panel from the high voltage transformer G4D1C1. An Electrical Applications Safety Permit shall be NOT required for this project. However, all work shall comply with the Glenn High Voltage Electric Power Systems Operating Instructions and in particular HVEP-OI-012, which states that a NASA Designated Safety Person (DSP, which is a NASA High Voltage Safety Person) is required during all work in electric supply stations, including substations and transformer yards, during work in manholes and power tunnels, during all switching and other steps required to isolate and ground work areas, during testing of new or modified circuits or equipment, and during all switching and other steps required to re-energize work areas. In addition:

1. Because transformer G4D1C1 does not have a an isolation barrier between the low voltage and high voltage compartments, a DSP shall be required whenever the transformer compartment is open, even though the installation consists of low voltage work.
2. Work area (transformer G4D1C1) shall be electrically isolated (Lockout/Tagout) by two opens in series and visible personnel safety grounds installed on the transformer primary by the Contractor completing the task. The two opens in series shall be accomplished by opening the primary

disconnect switch G4D1C1PD and removing the fuses.

3. The DSP and the Contractor's Representative shall verify that each work site is electrically isolated and safe.
4. An area clearance shall be completed for this work.
5. The DSP shall be scheduled at least two (2) weeks in advance.

This high voltage electrical shutdown will only affect Building 109.

In areas where lighting systems shall be replaced, the Contractor(s) shall provide and install temporary lighting before proceeding with demolition. The temporary lighting shall be installed such that adequate lighting for personnel safety is provided and maintained. The temporary lighting shall remain in service until the new lighting systems are installed, tested, and fully operational.

Environmental:

All asbestos containing materials (ACM), loose lead-based paint (LBP), and mercury contaminated waste shall be removed by a licensed abatement contractor according to federal, state, and local requirements. See specific abatement sections below for additional information.

The project includes the excavation of hazardous waste soils; see the specific section below for information.

A GRC Environmental Management Office (EMO) representative shall sign all paperwork related to the disposal of abated materials and solid and hazardous waste as the Generator of record. This includes waste profiles and manifests.

Contractor shall submit a **site-specific** health and safety plan (HASP) identifying the competent person, methods of hazardous waste removal, and disposal information. Follow guidelines in Specification Sections 01104, 13281, 13282, and NASA GRC environmental management system policy. The HASP shall be reviewed and approved (signed) by the Environmental Management Office (EMO) and the Glenn Safety Office (GSO) prior to NTP for the fieldwork.

Asbestos Abatement:

The Asbestos Abatement Contractor shall provide for the removal of asbestos-containing materials (ACM) as required and as identified in the plans and specifications. All other trades shall not enter an asbestos abatement work area for any reason until final inspections and air clearance monitoring indicate that the abatement work is complete and the area is clean.

A detailed asbestos survey of Building 109 has been performed and is shown

in Appendix I below. Based on this survey, ACM exists in the building and may be disturbed by construction activities. Any operations involving the removal or disturbance of such materials shall be performed in accordance with Specification Section 13281.

The possibility exists that ACM may be present on some areas that could not be inspected during the building asbestos survey. The Contractor shall proceed with caution during demolition work, and must stop work and contact the CM immediately if any suspect ACM is encountered.

Lead Abatement:

The Lead Abatement Contractor shall provide for the removal of lead-based paint (LBP) as required and as identified in the plans and specifications. All other trades shall not enter a lead abatement work area for any reason until the area has been cleaned (HEPA vacuumed and wet wiped) and final inspections indicate that the abatement work is complete and the area is clean.

A detailed LBP survey of Building 109 has been performed and is shown in Appendix I below. Based on this survey, LBP exists in the building and may be disturbed by construction activities. Any operations involving the removal or disturbance of paint shall be performed in accordance with Specification Section 13282.

Mercury Abatement:

The Mercury Abatement Contractor shall provide for the removal of mercury-containing materials as required and as identified in the plans and specifications.

A detailed mercury survey of Building 109 has been performed and is shown in Appendix I below. Based on this survey, Areas of Concern (AOC) for mercury exist in the building and may be disturbed by construction activities. In particular, the survey identifies mercury contamination in some concrete floor corners, cracks, drains, and the roof (including the stack).

Since the roof is to be replaced and the stack is to be removed, additional sampling in these areas was performed by the NASA Waste Management Office. Samples of the roofing material were taken on 6-3-04 from three points near the stack and from one point on the lower roof. Two wipe samples were also taken from the inside of the vent stack. All samples were analyzed for total mercury. Two of the samples taken near the stack had elevated levels of mercury, so it was requested that the lab test for TCLP mercury. This test was done on 6-23-04 and the results were ND (non-detect). The wipe test results on the stack found mercury, but well below regulatory standards. The locations and results of these samples are shown in Appendix II below. The results of this sampling activity confirm that the roof material is contaminated with mercury, and shall be handled and disposed of as a solid

waste. The stack is NOT mercury contaminated, but should be disposed of with the roofing materials.

The Contractor shall plan the work to avoid working in areas indicated in the survey as mercury contaminated. If these areas must be disturbed, the following requirements shall be followed by the Contractor on this project:

1. Provide proper PPE including respiratory protection using a HEPA / Mercury Vapor combination cartridge for possible mercury exposures. Personal air sampling shall be conducted.
2. Drains or traps shall be visually inspected, if feasible, for signs of mercury that impact this project.
3. Contact the NASA CM (who will coordinate with the GRC Industrial Hygiene Team) if any health and safety issues arise and support is needed.
4. Jerome Mercury Vapor Analyzer monitoring shall be performed by the Contractor during construction activities.

The Contractor shall proceed with caution during demolition work, and must stop work and contact the NASA CM immediately if any suspect mercury is encountered.

Hazardous Waste Soil Excavation:

This project includes the excavation of hazardous waste and commercial/industrial fill soils. The areas are shown on contract drawings SK-DEMO-C1 and CF-197708. All pavement, aggregate base, and soil to be removed from the area indicated as hazardous waste shall be handled, transported, and disposed of as a RCRA listed hazardous waste in accordance with Specification Section 01104.

In addition, the area indicated as “exceeding land disposal regulations” in SK-DEMO-C1 and CF-197708 shall NOT be excavated under any circumstances. Any costs associated with excavation in this area are the sole responsibility of the Contractor.

Excess excavated soil from the area indicated as “commercial/industrial fill” shall be removed from Government property and transported to a Commercial or Industrial Fill Site meeting the definitions found in the Ohio Voluntary Action Program OAC 3745-300. In no case shall the replacement of the excess excavated soil be allowed to come into contact with a waterway. No commercial/industrial fill soil shall be removed from the site without the written authorization of the Government in the form of completed and signed Manifests and Property Passes.

The floor excavation in Room 103 for the floor drain installation shall be

performed by OSHA 40-hour HAZWOPER trained personnel. The excavated soil shall be placed in drums to be provided by the NASA Waste Management Team (WMT). The drums shall be labeled per the direction of the WMT, and the filled drums shall be delivered to Building 212 at the end of each work day. The Contractor shall notify the CM at least two weeks in advance as to the number of drums required. The Contractor shall perform air monitoring for mercury vapors during the excavation activity.

PCB Ballasts and Fluorescent Lamp Disposal:

The Contractor shall be required to remove the ballast(s) and lamps from all fluorescent fixtures identified for removal and disposal. The Contractor shall place all ballasts in Government-furnished DOT 17C, 55 gallon drums. The Government shall furnish transportation and disposal for the drums containing the PCB ballasts. The Contractor shall place all lamps for disposal in an on-site Government-provided waste bin designated for fluorescent lamps. Disposal shall be by the Government.

**FY04 Upgrade of the Heated Tube Facility, Building 109
Project #97-028**

Preliminary Construction Schedule



| | | | | | | |
|---------------|----------|--|-----------|---|--------------------|---|
| Date: 11/3/04 | Task | | Milestone | ◆ | External Milestone | ◆ |
| | Progress | | Summary | | Deadline | ↓ |

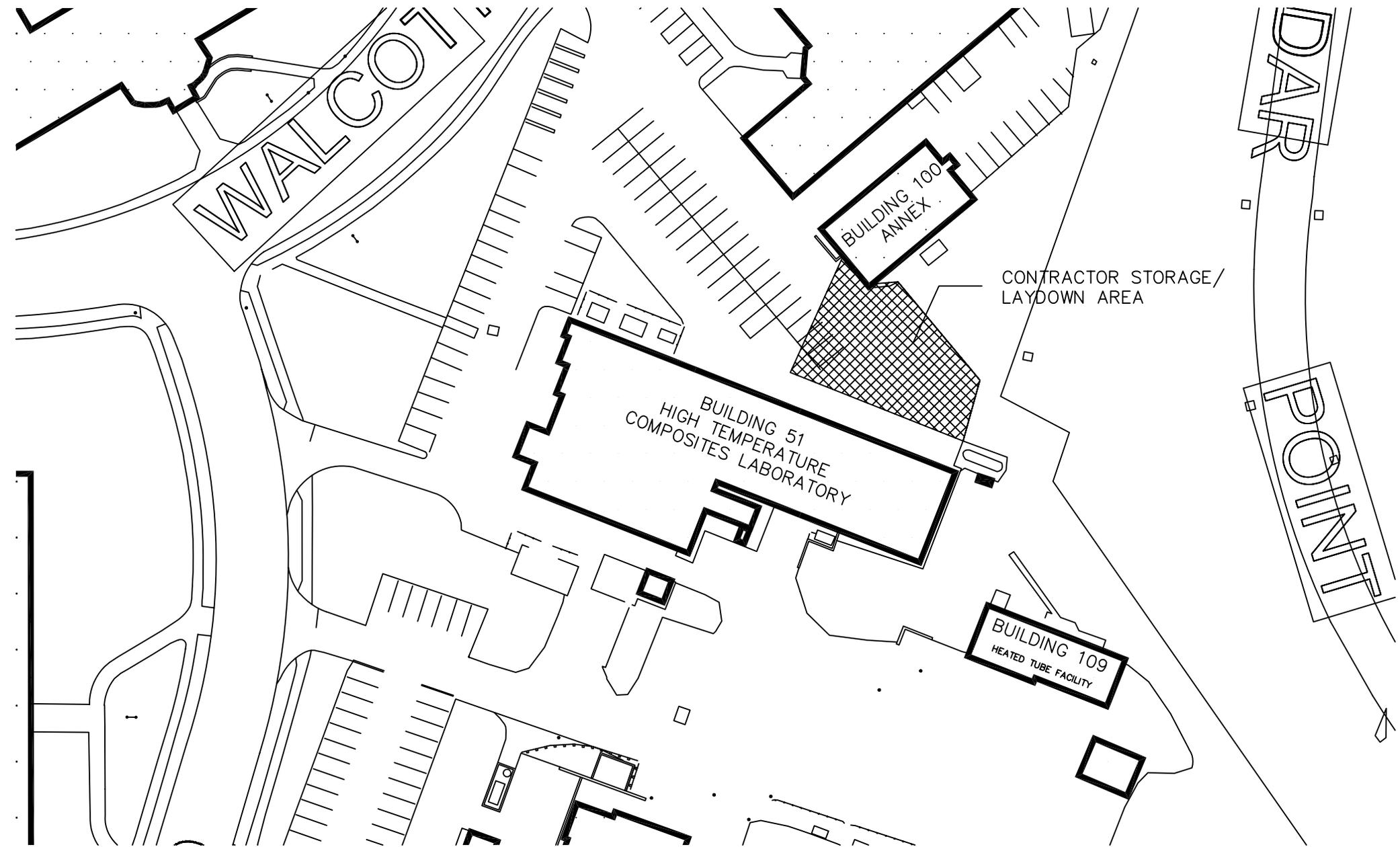


FIGURE 2

Appendix I

SUMMARY REPORT

SAIC-FASS TEAM
MERCURY/ACM/LBP SURVEY
BUILDING 109
09/06/01-1300

INTRODUCTION:

Don Hicks, (Environmental Management Office (EMO), Industrial Hygiene Team (IHT), performed the MERCURY survey. The MERCURY survey was conducted utilizing a JEROME Mercury Vapor Analyzer and small stainless steel brushes for the brush and sniff method.

State of Ohio certified Lead Risk Assessors and Asbestos Hazard Evaluation Specialists performed this survey in accordance with all Federal, State, and Local Regulations. The FASS Team collected the bulk paint and suspect asbestos samples. The paint samples were submitted to the EMO-GRC Lab to determine the lead content. The suspect asbestos samples were submitted to EAGROUP Laboratories for analysis for asbestos content.

The Asbestos Containing Material (ACM) survey consisted of a visual inspection, bulk sample collection, and PLM analysis. The Lead Based Paint (LBP) survey consisted of visual inspection, XRF readings, bulk sample collection, and laboratory analysis. The results of the ACM and LBP survey are outlined in the attached spreadsheets. The information provide on the spreadsheets includes suspect materials descriptions, material conditions, estimated quantities, accessibility (Height), and the analytical results.

SUMMARY:

Mercury

(SEE ATTACHED MERCURY SURVEY DATA / DIAGRAM SHEETS)

The results of the MERCURY survey identified considerable mercury contamination in the concrete floor corners, cracks, drains, and roof.

Asbestos Containing Material (ACM)

(SEE ATTACHED ACM SURVEY SPREAD SHEETS / DIAGRAM SHEETS)

NOTE: All PIPING GASKETS and FIRE DOORS are assumed to be ASBESTOS CONTAINING:

The results of the ACM survey identified the following **Asbestos Containing Materials:**

- Transite Panels at the change in elevation of the roof.
- Roof Flashing Material.
- Window Caulking.

Lead Based Paint (LBP)

(SEE NEXT PAGE)

Lead Based Paint (LBP)

(SEE ATTACHED LBP XRF/BULK SAMPLE SURVEY SPREAD SHEETS / DIAGRAM SHEETS)

Based upon the LBP survey data the **beige, off white, gray, black, and olive** color paints were determined to be **POSITIVE for LEAD CONTENT.**

Based upon the LBP survey data the **brown and dark beige** color paints were determined to be **NEGATIVE for LEAD CONTENT.**

NASA-GRC GUIDELINES DEFINE LEAD BASED PAINT (LBP) as PAINT CONTAINING LEAD at 0.06% by Weight (Wt.) and the NASA-GRC HEALTH and SAFETY PROCEDURES SHOULD BE FOLLOWED.

Please Note: **% by Wt.** for LBP is a more accurate and recognized analytical measurement for Lead in Paints (CLEAN UP LEVELS, EXPOSURE, ETC) than **mg/cm²**. The LBP XRF / BULK SAMPLE spreadsheet provides an unofficial correlation between **% by Wt.** and **mg/cm²**. The XRF is not an OSHA recognized method for determining the lead content of paint.

Building-109; First Floor

| | | | | | | | | | | |
|-------------------|---------------|---------------|-----------|---|-----------|-----------|---|---------------|-----------|--------------|
| Restroom Readings | 0 | 0 | 0.003 | 0.003 | 0.004 | 0 | 0 | Door | Pumps | Pumps |
| | 0.003 | 0 | 0 | 0.007 | 0 | 0 | 0 | 0 | 0 | 0 |
| North Wall | 0.005 | 0 | 0.018 | 0.009 | 0 | 0.003 | 0 | 0 | 0 | 0 |
| 0 | 0.008 | 0 | 0.021 | 0.019 | 0.004 | 0.003 | 0 | 0 | 0.016 | 0 |
| 0.021 | Ave: .002 | Ave: .000 | Ave: .007 | Ave: .006 | Ave: .001 | Ave: .001 | Ave: .000 | 0 | 0.005 | 0 |
| 0.03 | | | | | | | | Ave: .000 | 0.021 | Ave: .000 |
| 0.051 | 0 | 0 | 0 | 0 | 0.003 | 0 | 0 | | Ave: .007 | |
| Ave: .017 | 0 | 0 | 0 | 0 | 0 | 0.003 | 0 | | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| Middle of Room | 0 | 0 | 0 | 0 | 0.003 | 0 | 0 | | | |
| 0 | Ave: .000 | Ave: .000 | Ave: .000 | Ave: .000 | Ave: .001 | 0.003 | 0 | 0 | 0.017 | |
| 0 | | | | | Water | Ave: .001 | Ave: .000 | 0 | 0.015 | S |
| 0 | 0 | 0 | 0.011 | | Tank | | | 0 | 0.025 | |
| O | 0.004 | 0 | 0.004 | Capped | 0 | 0 | 0 | 0 | 0.057 | O |
| Ave: .000 | 0 | 0 | 0 | Drain | 0 | 0 | 0 | Ave: .000 | Ave: .019 | |
| | 0.004 | 0 | 0.015 |  | 0 | 0 | 0 | | | |
| R | Ave: .001 | Ave: .000 | Ave: .005 | 0.065 | 0 | 0 | 0 | | | |
| South Wall | | | | 0.006 | Ave: .000 | Ave: .000 | Plugged | | | |
| 0.007 | | | | 0.022 | | | Drain | | | |
| 0.008 | | | | 0.093 | | |  | | | |
| 0.014 | | | | Ave: .031 | | | 0 | 0 | | |
| 0.029 | | | | | | | 0 | 0 | | |
| Ave: .009 | | | | | | | 0 | 0 | | |
| | Restroom | | | | | | 0 | | | |
| | | | | | Sink | Water | Ave: .000 | | | |
| | | Overhead Door | Door | | Fountain | | | Overhead Door | 0.222 | H |
| | | | | | | | | | 0.368 | |
| | | | | | | | | | 0.026 | |
| | | | | | | | | | 0.416 | Capped Drain |
| | | | | | | | | | Ave: .138 | 0 |
| | | | | | | | | | | 0.003 |
| | | | | | | | | | | 0 |
| | | | | | | | | | | 0.003 |
| | | | | | | | | | | Ave: .001 |
| | Overhead Door | Drain Cap | Door | | | | | Overhead Door | | |
| | 0 | 0.005 | 0 | | | | | 0 | | |
| | 0 | 0 | 0 | | | | | 0 | | |
| | 0 | 0.005 | 0 | | | | | 0 | | |
| | 0 | 0.01 | 0 | | | | | 0 | | |
| | Ave: .000 | Ave: .003 | Ave: .000 | | | | | Ave: .000 | | |

Building-109: Roof

| Lower Roof | | Upper Roof | | | | Ladder |
|------------|-----------|------------|-----------|---------------------------|-----------|-----------|
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ave: .000 | Ave: .000 | Ave: .000 | Ave: .000 | Ave: .000 | Ave: .000 | Ave: .000 |
| | | | | Under Roofing Material | Stack | |
| 0 | 0 | 0 | 0 | 0.015 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.016 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.017 | 0 | 0 |
| 0 | 0 | 0 | 0 | 0.048 | 0 | 0 |
| Ave: .000 | Ave: .000 | Ave: .000 | Ave: .000 | Ave: .016 | Ave: .000 | Ave: .000 |
| 0 | 0 | 0 | 0 | | 0 | 0 |
| 0 | 0 | 0 | 0 | | 0 | 0 |
| 0 | 0 | 0 | 0 | | 0 | 0 |
| Ave: .000 | Ave: .000 | Ave: .000 | Ave: .000 | | Ave: .000 | Ave: .000 |

| Ambient Air Inside Stack | Inside Stack (Ambient) Below Damper | Stack Flashing |
|-----------------------------|--|----------------|
| 0.028 | 0.015 | 0 |
| 0.022 | 0.011 | 0 |
| 0.022 | 0.011 | 0 |
| 0.072 | 0.037 | 0 |
| Ave: .024 | Ave: .012 | Ave: .000 |

ASBESTOS CONTAINING MATERIAL (ACM) SURVEY

Building 109

DATE: 09/06/01-1300

| Location | Homogeneous Group | Material Description | Quantity SF, LF or Ea. | Type | Condition | Accessibility (Elevation) | | | Sample # | Lab Results | Remarks |
|-----------------------|-------------------|-----------------------|------------------------|------|-----------|---------------------------|---------|--------|-----------------------|----------------|------------------------------------|
| | | | | | | 0-6 ft | 6-12 ft | >12 ft | | | |
| Building 109 Roof | 7000 | Flat Built Up Roofing | 1985 SF | NF1 | D | | | X | 109-ROOF-7000-001 | ND | |
| Building 109 Roof | 7001 | Roof Flashing | 178 SF | NF1 | D | | | X | 109-ROOF-7001-002 | 20% Chrysotile | |
| Building 109 Room 101 | 8000 | Transite Sheet | 36 SF | NF2 | G | | | X | 109-101-8000-003 | 25% Chrysotile | North Wall at Roof Line |
| Building 109 Room 101 | 8001 | Window Caulking | 212 LF | NF1 | D | X | X | | 109-101-8001-004 | 2% Chrysotile | Total Quantity Throughout Building |
| Building 109 Restroom | 3000 | Drywall | 72 SF | NF2 | G | X | X | | REF: 109-OFF-3000-005 | ND | Ceiling |
| Building 109 Restroom | 3001 | Joint Compound | 24 SF | F | G | X | X | | REF: 109-OFF-3001-006 | ND | Ceiling |

Type

F-FRIABLE
 NF1-NONFRIABLE (CATEGORY 1)
 NF2-NONFRIABLE (CATEGORY 2)

Condition

D-Damaged
 G-Good (90%)

Abbreviations

N/S-Not Sampled
 ND-None Detected
 POS-Positive ACM
 REF:-Reference

ASBESTOS CONTAINING MATERIAL (ACM) SURVEY

Building 109

DATE: 09/06/01-1300

| Location | Homogeneous Group | Material Description | Quantity SF, LF or Ea. | Type | Condition | Accessibility (Elevation) | | | Sample # | Lab Results | Remarks |
|---------------------|-------------------|-----------------------------------|------------------------|------|-----------|---------------------------|---------|--------|------------------|-------------|-------------------|
| | | | | | | 0-6 ft | 6-12 ft | >12 ft | | | |
| Building 109 Office | 3000 | Drywall | 542 SF | NF2 | D | X | X | | 109-OFF-3000-005 | ND | Ceiling and Walls |
| Building 109 Office | 3001 | Joint Compound | 184 SF | F | D | X | X | | 109-OFF-3001-006 | ND | Ceiling and Walls |
| Building 109 Office | 3001 | Joint Compound | see above | F | D | X | X | | 109-OFF-3001-007 | ND | Ceiling and Walls |
| Building 109 Office | 3001 | Joint Compound | see above | F | D | X | X | | 109-OFF-3001-008 | ND | Ceiling and Walls |
| Building 109 Office | 2000 | 4" Dark Brown Base Molding | 24 SF | NF1 | G | X | | | 109-OFF-2000-009 | ND | |
| Building 109 Office | 2001 | Mastic-4" Dark Brown Base Molding | 24 SF | NF1 | G | X | | | 109-OFF-2001-010 | ND | |

Type

F-FRIABLE
 NF1-NONFRIABLE (CATEGORY 1)
 NF2-NONFRIABLE (CATEGORY 2)

Condition

D-Damaged
 G-Good (90%)

Abbreviations

N/S-Not Sampled
 ND-None Detected
 POS-Positive ACM
 REF:-Reference

LEAD BASED PAINT
XRF/BULK SAMPLE SURVEY
DATE: 09-06-01-1300

BUILDING 109

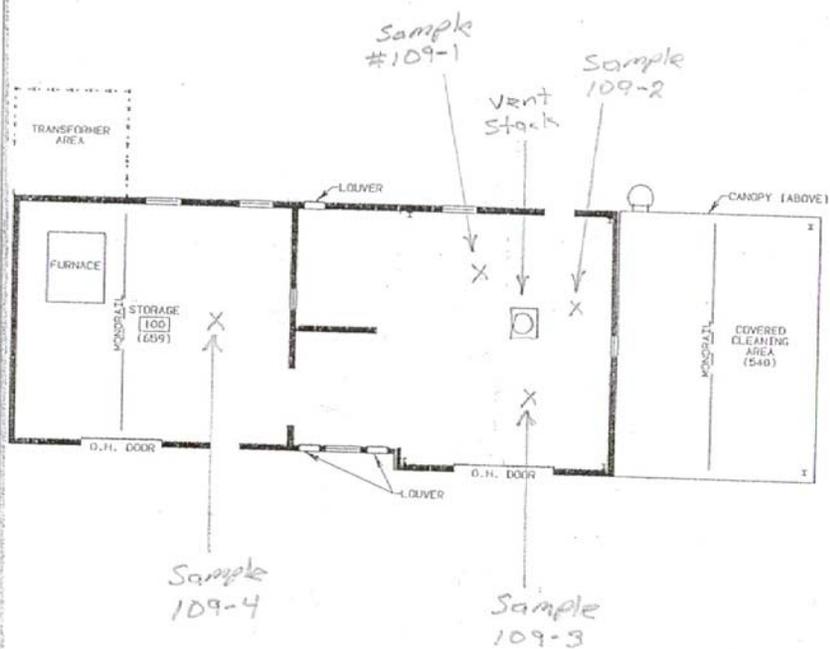
| # | XRF Rdg. # | Description / Location / (Substrate) | Color of Paint | XRF Result mg/cm ² | Bulk Sample # | LAB Result Lead (Pb) mg/cm ² | LAB Result Lead (Pb) % by Wt. | Remarks |
|----|------------|---|----------------|----------------------------------|---------------|---|-------------------------------------|--------------------------|
| 1 | 381 | Calibrate | N/A | 1.1 | N/S | | | OK |
| 2 | 382 | Calibrate | N/A | 1.1 | N/S | | | OK |
| 3 | 383 | Calibrate | N/A | 1.2 | N/S | | | NO |
| 4 | 384 | Calibrate | N/A | 1.1 | N/S | | | OK |
| 5 | 385 | East Wall / Room 100 / Concrete Block | Off White | 0.06 | 109-Pb-001 | NA | 0.070% | POSITIVE FOR LEAD |
| 6 | 386 | North Wall / Room 100 / Drywall | Beige | 0.00 | N/S | | | POSITIVE FOR LEAD |
| 7 | 387 | Overhead Door / Room 100 / Metal | Gray | 0.02 | N/S | | | POSITIVE FOR LEAD |
| 8 | 388 | Overhead Door Frame / Room 100 / Metal | Black | 0.00 | N/S | | | POSITIVE FOR LEAD |
| 9 | 389 | Door North Wall / Room 100 / Metal | Brown | 0.01 | N/S | | | <u>NEGATIVE FOR LEAD</u> |
| 10 | 390 | Bathroom Door Frame / Room 100 / Metal | Off White | 0.04 | N/S | | | POSITIVE FOR LEAD |
| 11 | 391 | Bathroom Heater / Bathroom / Metal | Olive | 0.1 | N/S | | | POSITIVE FOR LEAD |
| 12 | 392 | I Beam East Wall / Room 101 / Metal | Off White | 0.00 | N/S | | | POSITIVE FOR LEAD |
| 13 | 393 | Tank East Wall / Room 101 / Metal | Off White | 1.50 | N/S | | | POSITIVE FOR LEAD |
| 14 | 394 | Space Heater South East Corner / Room 101 / Metal | Brown | 0.05 | N/S | | | <u>NEGATIVE FOR LEAD</u> |
| 15 | 395 | Angle Iron Support For Tank / Room 101 / Metal | Off White | 0.80 | N/S | | | POSITIVE FOR LEAD |
| 16 | 396 | Cover Plate On Botom Of Stack / Room 101 / Metal | Off White | 0.00 | N/S | | | POSITIVE FOR LEAD |
| 17 | 397 | I Beam West Wall / Room 101 / Metal | Off White | 0.05 | N/S | | | POSITIVE FOR LEAD |
| 18 | 398 | Overhead Door Frame / Room 101 / Metal | Brown | 0.00 | N/S | | | <u>NEGATIVE FOR LEAD</u> |
| 19 | 399 | Floor / Room 101 / Concrete | Brown | 0.03 | N/S | | | <u>NEGATIVE FOR LEAD</u> |
| 20 | 400 | West Exterior Wall / Room 101 / Concrete Block | Dark Beige | 0.03 | N/S | | | <u>NEGATIVE FOR LEAD</u> |

Abbreviations
N/S-Not Sampled

Appendix II

MERCURY SAMPLING RESULTS BUILDING 109 ROOF JUNE 2004

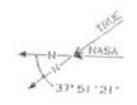
NASA LEWIS RESEARCH CENTER
CLEVELAND, OHIO



COMPONENTS CLEANING FACILITY
BUILDING 109 FLOOR PLAN

REF DWG CD-151425, CD-151430, CC-151440,
CD-151441 & CD-151450

REVISED 08/20/92
DRAWING IS AVAILABLE ON CAQH
BRAN, 109



□□□ — ROOM N&M
□□□□ — AREA SH.



GRAPHIC SCALE



STL

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ANALYTICAL REPORT

PROJECT NO. 639525

BLDG. 109 ROOF

Lot #: A4F040137

Joe Trapp

SAIC
21000 Brookpark Road
Brookpark, OH 44135

SEVERN TRENT LABORATORIES, INC.


Frank J. Calovini
Project Manager

June 17, 2004

CASE NARRATIVE

A4F040137

The following report contains the analytical results for four solid samples and two wipe samples submitted to STL North Canton by SAIC from the Bldg. 109 Roof Site, project number 639525. The samples were received June 04, 2004, according to documented sample acceptance procedures.

STL utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameter(s) listed on the analytical methods summary page in accordance with the method(s) indicated. Preliminary results were provided to Joe Trapp on June 11, 2004. A summary of QC data for these analyses is included at the back of the report.

STL North Canton attests to the validity of the laboratory data generated by STL facilities reported herein. All analyses performed by STL facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the applicable methods. STL's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by a dry weight adjustment footnote at the bottom of the analytical report page. The list of parameters which are never reported on a dry weight basis is included on the Sample Summary.

This report is sequentially paginated. The final page of the report is labeled as "END OF REPORT."

SUPPLEMENTAL QC INFORMATION

SAMPLE RECEIVING

The temperature of the cooler upon sample receipt was 14.7°C without any coolant present.

METALS

The analytical results met the requirements of the laboratory's QA/QC program.

GENERAL CHEMISTRY

The analytical results met the requirements of the laboratory's QA/QC program.

QUALITY CONTROL ELEMENTS OF SW-846 METHODS

STL North Canton conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program, which is described in detail in QA Policy, QA-003. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

QC BATCH

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. STL North Canton requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. All control analytes indicated by a bold type in the LCS must meet acceptance criteria. Failure to meet the established recovery guidelines requires the reparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND (non-detected) for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). If the RPD fails for an LCS/LCSD and yet the recoveries are within acceptance criteria, the batch is still acceptable.

METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except under the following circumstances:

- Common organic contaminants may be present at concentrations up to 5 times the reporting limits. Common metals contaminants may be present at concentrations up to 2 times the reporting limit, or the reported blank concentration must be twenty fold less than the concentration reported in the associated environmental samples. (See common laboratory contaminants listed below.)

Volatile (GC or GC/MS)

Methylene chloride

Acetone

2-Butanone

Semivolatile (GC/MS)

Phthalate Esters

Metals

Copper

Iron

Zinc

Lead*

- *for analyses run on TJA Trace ICP, ICPMS or GFAA only*

QUALITY CONTROL ELEMENTS OF SW-846 METHODS (Continued)

- Organic blanks will be accepted if compounds detected in the blank are present in the associated samples at levels 10 times the blank level. Inorganic blanks will be accepted if elements detected in the blank are present in the associated samples at 20 times the blank level.
- Blanks will be accepted if the compounds/elements detected are not present in any of the associated environmental samples.

Failure to meet these Method Blank criteria requires the reparation and reanalysis of all samples in the QC batch.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. Due to the potential variability of the matrix of each sample, the MS/MSD results may not have an immediate bearing on any samples except the one spiked; therefore, the associated batch MS/MSD may not reflect the same compounds as the samples contained in the analytical report. When these MS/MSD results fail to meet acceptance criteria, the data is evaluated. If the LCS is within acceptance criteria, the batch is considered acceptable. The acceptance criteria do not apply to samples that are diluted for organics if the native sample amount is 4x the concentration of the spike.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch. However, a Sample Duplicate is less likely to provide usable precision statistics depending on the likelihood of finding concentrations below the standard reporting limit. When the Sample Duplicate result fails to meet acceptance criteria, the data is evaluated.

SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample is spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

If surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank, and the associated sample(s) are ND, the batch is acceptable. Otherwise, if the LCS, LCSD, or Method Blank surrogate(s) fail to meet recovery criteria, the entire sample batch is repped and reanalyzed. If the surrogate recoveries are outside criteria for environmental samples, the samples will be repped and reanalyzed unless there is objective evidence of matrix interference or if the sample dilution is greater than the threshold outlined in the associated method SOP.

For the GC/MS BNA methods, the surrogate criterion is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide, PCB, and PAH methods, the surrogate criterion is that one of two surrogate compounds must meet acceptance criteria.



STL North Canton Certifications and Approvals:

Alabama (#41170), California (#01144CA), Connecticut (#PH-0590), Florida (#E87225), Illinois (#100439), Kansas (#E10336), Massachusetts (#M-OH048), Maryland (#272), Minnesota (#39-999-348), New Jersey (#OH001), New York (#10975), Ohio (#6090), OhioVAP (#CL0024), Rhode Island (#237), South Carolina (#92007001, #92007002, #92007003), Tennessee (#02903), Utah (#QUAN9), Virginia (#00011), West Virginia (#210), Wisconsin (#999518190), NAVY, ARMY, USDA Soil Permit, ACIL Seal of Excellence – Participating Lab Status Award (#82)

Y:\HerrenD\FORMS\New exp inserts\sw846 2-2-04.doc, Revised: 01/28/04 DJL

EXECUTIVE SUMMARY - Detection Highlights

A4F040137

| <u>PARAMETER</u> | <u>RESULT</u> | <u>REPORTING LIMIT</u> | <u>UNITS</u> | <u>ANALYTICAL METHOD</u> |
|---------------------------------|---------------|----------------------------|--------------|------------------------------|
| 109-1 06/03/04 10:00 001 | | | | |
| Percent Solids | 99.2 | 10.0 | % | MCAWW 160.3 MOD |
| 109-2 06/03/04 10:00 002 | | | | |
| Mercury | 0.88 | 0.10 | mg/kg | SW846 7471A |
| Percent Solids | 99.4 | 10.0 | % | MCAWW 160.3 MOD |
| 109-3 06/03/04 10:00 003 | | | | |
| Mercury | 0.24 | 0.10 | mg/kg | SW846 7471A |
| Percent Solids | 99.2 | 10.0 | % | MCAWW 160.3 MOD |
| 109-4 06/03/04 10:00 004 | | | | |
| Percent Solids | 98.4 | 10.0 | % | MCAWW 160.3 MOD |
| 109-5 06/03/04 10:00 005 | | | | |
| Mercury | 0.010 | 0.00040 | mg/wipe | SW846 7471A |
| 109-6 06/03/04 10:00 006 | | | | |
| Mercury | 0.014 | 0.00040 | mg/wipe | SW846 7471A |

ANALYTICAL METHODS SUMMARY

A4F040137

| <u>PARAMETER</u> | <u>ANALYTICAL METHOD</u> |
|--|------------------------------|
| Mercury in Solid Waste (Manual Cold-Vapor) | SW846 7471A |
| Total Residue as Percent Solids | MCAWW 160.3 MOD |

References:

- MCAWW "Methods for Chemical Analysis of Water and Wastes",
EPA-600/4-79-020, March 1983 and subsequent revisions.
- SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical
Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

A4F040137

| <u>WO #</u> | <u>SAMPLE#</u> | <u>CLIENT SAMPLE ID</u> | <u>SAMPLED DATE</u> | <u>SAMP TIME</u> |
|-------------|----------------|-------------------------|---------------------|------------------|
| GHK86 | 001 | 109-1 | 06/03/04 | 10:00 |
| GHK88 | 002 | 109-2 | 06/03/04 | 10:00 |
| GHK89 | 003 | 109-3 | 06/03/04 | 10:00 |
| GHK9A | 004 | 109-4 | 06/03/04 | 10:00 |
| GHK9C | 005 | 109-5 | 06/03/04 | 10:00 |
| GHK9D | 006 | 109-6 | 06/03/04 | 10:00 |

NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

SAIC - NASA-GRC

Client Sample ID: 109-1

TOTAL Metals

Lot-Sample #...: A4F040137-001

Matrix.....: SO

Date Sampled...: 06/03/04 10:00 Date Received...: 06/04/04

% Moisture.....: 0.84

| <u>PARAMETER</u> | <u>RESULT</u> | <u>REPORTING LIMIT</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>WORK ORDER #</u> |
|--------------------------|---------------|----------------------------|--------------|---------------|---------------------------------------|-------------------------|
| Prep Batch #...: 4159015 | | | | | | |
| Mercury | ND | 0.10 | mg/kg | SW846 7471A | 06/07-06/09/04 | GHK861AC |
| | | Dilution Factor: 1 | | | | |

SAIC - NASA-GRC

Client Sample ID: 109-1

General Chemistry

Lot-Sample #....: A4F040137-001 Work Order #....: GHK86 Matrix.....: SO
Date Sampled...: 06/03/04 10:00 Date Received...: 06/04/04
% Moisture.....: 0.84

| <u>PARAMETER</u> | <u>RESULT</u> | <u>RL</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>PREP BATCH #</u> |
|------------------|---------------|-----------|--------------|-----------------|---------------------------------------|-------------------------|
| Percent Solids | 99.2 | 10.0 | % | MCAWW 160.3 MOD | 06/07-06/08/04 | 4159381 |

Dilution Factor: 1

SAIC - NASA-GRC

Client Sample ID: 109-2

TOTAL Metals

Lot-Sample #....: A4F040137-002

Date Sampled...: 06/03/04 10:00 Date Received...: 06/04/04

% Moisture.....: 0.64

Matrix.....: SO

| <u>PARAMETER</u> | <u>RESULT</u> | <u>REPORTING LIMIT</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>WORK ORDER #</u> |
|---------------------------|---------------|----------------------------|--------------|---------------|---------------------------------------|-------------------------|
| Prep Batch #....: 4159015 | | | | | | |
| Mercury | 0.88 | 0.10 | mg/kg | SW846 7471A | 06/07-06/09/04 | GHK881AC |
| | | Dilution Factor: 1 | | | | |

SAIC - NASA-GRC

Client Sample ID: 109-2

General Chemistry

Lot-Sample #...: A4F040137-002 Work Order #...: GHK88 Matrix.....: SO
Date Sampled...: 06/03/04 10:00 Date Received...: 06/04/04
% Moisture.....: 0.64

| <u>PARAMETER</u> | <u>RESULT</u> | <u>RL</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>PREP BATCH #</u> |
|------------------|---------------|-----------|--------------|-----------------|---------------------------------------|-------------------------|
| Percent Solids | 99.4 | 10.0 | % | MCAWW 160.3 MOD | 06/07-06/08/04 | 4159381 |

Dilution Factor: 1

SAIC - NASA-GRC

Client Sample ID: 109-3

TOTAL Metals

Lot-Sample #...: A4F040137-003

Matrix.....: SO

Date Sampled...: 06/03/04 10:00 Date Received...: 06/04/04

% Moisture.....: 0.80

| <u>PARAMETER</u> | <u>RESULT</u> | <u>REPORTING LIMIT</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>WORK ORDER #</u> |
|--------------------------|---------------|----------------------------|--------------|---------------|---------------------------------------|-------------------------|
| Prep Batch #...: 4159015 | | | | | | |
| Mercury | 0.24 | 0.10 | mg/kg | SW846 7471A | 06/07-06/09/04 | GHK891AC |

Dilution Factor: 1

SAIC - NASA-GRC

Client Sample ID: 109-3

General Chemistry

Lot-Sample #...: A4F040137-003 Work Order #...: GHK89 Matrix.....: SO
Date Sampled...: 06/03/04 10:00 Date Received...: 06/04/04
% Moisture.....: 0.80

| <u>PARAMETER</u> | <u>RESULT</u> | <u>RL</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>PREP BATCH #</u> |
|------------------|---------------|-----------|--------------|-----------------|---------------------------------------|-------------------------|
| Percent Solids | 99.2 | 10.0 | % | MCAWW 160.3 MOD | 06/07-06/08/04 | 4159381 |

Dilution Factor: 1

SAIC - NASA-GRC

Client Sample ID: 109-4

TOTAL Metals

Lot-Sample #...: A4F040137-004

Matrix.....: SO

Date Sampled...: 06/03/04 10:00 Date Received...: 06/04/04

% Moisture.....: 1.6

| <u>PARAMETER</u> | <u>RESULT</u> | <u>REPORTING LIMIT</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>WORK ORDER #</u> |
|--------------------------|---------------|----------------------------|--------------|---------------|---------------------------------------|-------------------------|
| Prep Batch #...: 4159015 | | | | | | |
| Mercury | ND | 0.10 | mg/kg | SW846 7471A | 06/07-06/09/04 | GHK9A1AC |
| | | Dilution Factor: 1 | | | | |

SAIC - NASA-GRC

Client Sample ID: 109-4

General Chemistry

Lot-Sample #...: A4F040137-004 Work Order #...: GHK9A Matrix.....: SO
Date Sampled...: 06/03/04 10:00 Date Received...: 06/04/04
% Moisture.....: 1.6

| <u>PARAMETER</u> | <u>RESULT</u> | <u>RL</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>PREP BATCH #</u> |
|------------------|---------------|-----------|--------------|-----------------|---------------------------------------|-------------------------|
| Percent Solids | 98.4 | 10.0 | % | MCAWW 160.3 MOD | 06/07-06/08/04 | 4159381 |

Dilution Factor: 1

SAIC - NASA-GRC

Client Sample ID: 109-5

TOTAL Metals

Lot-Sample #...: A4F040137-005

Matrix.....: SW

Date Sampled...: 06/03/04 10:00 Date Received...: 06/04/04

| <u>PARAMETER</u> | <u>RESULT</u> | <u>REPORTING</u> <u>LIMIT</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION-</u> <u>ANALYSIS DATE</u> | <u>WORK</u> <u>ORDER #</u> |
|--------------------------|---------------|----------------------------------|--------------|---------------|---|-------------------------------|
| Prep Batch #...: 4159016 | | | | | | |
| Mercury | 0.010 | 0.00040 | mg/wipe | SW846 7471A | 06/07-06/09/04 | GHK9C1AA |

Dilution Factor: 20

SAIC - NASA-GRC

Client Sample ID: 109-6

TOTAL Metals

Lot-Sample #....: A4F040137-006

Matrix.....: SW

Date Sampled....: 06/03/04 10:00 Date Received...: 06/04/04

| <u>PARAMETER</u> | <u>RESULT</u> | <u>REPORTING LIMIT</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>WORK ORDER #</u> |
|---------------------------|---------------|----------------------------|--------------|---------------|---------------------------------------|-------------------------|
| Prep Batch #....: 4159016 | | | | | | |
| Mercury | 0.014 | 0.00040 | mg/wipe | SW846 7471A | 06/07-06/09/04 | GHK9D1AA |

Dilution Factor: 20



STL

QUALITY CONTROL SECTION

METHOD BLANK REPORT

TOTAL Metals

Client Lot #....: A4F040137

Matrix.....: SOLID

| <u>PARAMETER</u> | <u>RESULT</u> | <u>REPORTING LIMIT</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>WORK ORDER #</u> |
|------------------|---------------|----------------------------|--------------|---------------|---------------------------------------|-------------------------|
| MB Lot-Sample #: | A4F070000-015 | Prep Batch #....: | 4159015 | | | |
| Mercury | ND | 0.10 | mg/kg | SW846 7471A | 06/07-06/09/04 | GHPV91AA |
| | | Dilution Factor: 1 | | | | |

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

TOTAL Metals

Client Lot #...: A4F040137

Matrix.....: WIPE

| <u>PARAMETER</u> | <u>RESULT</u> | <u>REPORTING LIMIT</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>WORK ORDER #</u> |
|------------------|---------------|----------------------------|--------------|---------------|---------------------------------------|-------------------------|
| MB Lot-Sample #: | A4F070000-016 | Prep Batch #... | 4159016 | | | |
| Mercury | ND | 0.000020 | mg/wipe | SW846 7471A | 06/07-06/09/04 | GHPWD1AA |
| | | Dilution Factor: 1 | | | | |

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

General Chemistry

Client Lot #...: A4F040137

Matrix.....: SOLID

| <u>PARAMETER</u> | <u>RESULT</u> | <u>REPORTING</u> <u>LIMIT</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION-</u> <u>ANALYSIS DATE</u> | <u>PREP</u> <u>BATCH #</u> |
|------------------|---------------|----------------------------------|--------------|------------------|---|-------------------------------|
| Percent Solids | ND | Work Order #: GHQWQ1AA | | MB Lot-Sample #: | A4F070000-381 | |
| | | 10.0 | % | MCAWW 160.3 MOD | 06/07-06/08/04 | 4159381 |
| | | Dilution Factor: 1 | | | | |

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: A4F040137

Matrix.....: SOLID

| <u>PARAMETER</u> | <u>PERCENT RECOVERY</u> | <u>RECOVERY LIMITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>WORK ORDER #</u> |
|------------------|-----------------------------|----------------------------|---------------|---------------------------------------|---------------------|
| LCS Lot-Sample#: | A4F070000-015 | Prep Batch #...: | 4159015 | | |
| Mercury | 94 | (52 - 127) | SW846 7471A | 06/07-06/09/04 | GHPV91AC |
| | | Dilution Factor: | 1 | | |

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TOTAL Metals

Lot-Sample #...: A4F040137

Matrix.....: WIPE

| <u>PARAMETER</u> | <u>PERCENT RECOVERY</u> | <u>RECOVERY LIMITS</u> | <u>RPD</u> | <u>RPD LIMITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>PREP- BATCH #</u> |
|------------------|-------------------------|------------------------|------------|-------------------|---------------|-----------------------------------|----------------------|
| Mercury | 100 | (52 - 127) | | | SW846 7471A | 06/07-06/09/04 | 4159016 |
| | 95 | (52 - 127) | 5.0 | (0-20) | SW846 7471A | 06/07-06/09/04 | 4159016 |

Dilution Factor: 1

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TOTAL Metals

Client Lot #...: A4F040137

Matrix.....: SO

Date Sampled...: 06/03/04 10:00 Date Received...: 06/04/04

| <u>PARAMETER</u> | <u>PERCENT RECOVERY</u> | <u>RECOVERY LIMITS</u> | <u>RPD</u> | <u>RPD LIMITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>WORK ORDER #</u> |
|--|-------------------------|------------------------|------------|-------------------|---------------|-----------------------------------|---------------------|
| MS Lot-Sample #: A4F040137-001 Prep Batch #... : 4159015 | | | | | | | |
| Mercury | 94 | (10 - 209) | | | SW846 7471A | 06/07-06/09/04 | GHK861AD |
| | 94 | (10 - 209) | 0.09 | (0-20) | SW846 7471A | 06/07-06/09/04 | GHK861AE |

Dilution Factor: 1

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

STL Cooler Receipt Form/Narrative
North Canton Facility

Lot Number: A9F040137

Client: NASA/SAIC Project: Bldg 109 Rm 606 Quote#: 47282
 Cooler Received on: 6/4/04 Opened on: 6/9/04 by: [Signature]

Fedx Client Drop Off UPS Airborne FAS
 Cooler Foam Box Client Cooler Other: _____
 STL Cooler No#: _____

1. Were custody seals on the outside of the cooler? Yes No Intact? Yes No NA
 If YES, Quantity _____
 Were the custody seals signed and dated? Yes No NA
 2. Shipper's packing slip attached to this form? Yes No NA
 3. Did custody papers accompany the samples? Yes No Relinquished by client? Yes No
 4. Did you sign the custody papers in the appropriate place? Yes No
 5. Packing material used:
 Peanuts Bubble Wrap Vermiculite Foam None Other: _____
 6. Cooler temperature upon receipt 14.7 °C (see back of form for multiple coolers/temp)
 METHOD: Temp Vial Coolant & Sample Against Bottles IR ICE/H₂O Slurry
 COOLANT: Wet Ice Blue Ice Dry Ice Water None
 7. Did all bottles arrive in good condition (Unbroken)? Yes No
 8. Could all bottle labels and/or tags be reconciled with the COC? Yes No
 9. Were samples at the correct pH? (record on back) Yes No NA
 10. Were correct bottles used for the tests indicated? Yes No
 11. Were air bubbles >6 mm in any VOA vials? Yes No NA
 12. Was a sufficient amount of sample sent in each bottle? Yes No
 Contacted PM FJC Date: 6-9-04 by: [Signature] via Voice Mail Verbal Other
 Concerning: high temp

MACRO MICRO

1. CHAIN OF CUSTODY

SR1A The following discrepancies occurred:
No custody seals 6/9/04

2. SAMPLE CONDITION

SR2A Sample(s) _____ were received or requested after the recommended holding time had expired.
 SR2B Sample(s) _____ were received with insufficient volume.
 SR2C Sample(s) _____ were received in a broken container.

3. SAMPLE PRESERVATION

SR3A Sample(s) _____ were further preserved in sample receiving to meet recommended pH level(s).
Nitric Acid Lot #122603-HNO₃; Sulfuric Acid Lot # 011-504-H₂SO₄; Sodium Hydroxide Lot # 111401-NaOH; Hydrochloric Acid Lot # 100902-HCl; Sodium Hydroxide and Zinc Acetate Lot # 112801-CH₃COO₂ZN/NaOH
 SR3B Sample(s) _____ were received with bubble > 6 mm in diameter (cc: PM)

4. Other (see below or back)

END OF REPORT

ANALYTICAL REPORT

PROJECT NO. 639525

BLDG. 109 ROOF

Lot #: A4F150340

Joe Trapp

SAIC
21000 Brookpark Road
Brookpark, OH 44135

SEVERN TRENT LABORATORIES, INC.



Frank J. Calovini
Project Manager

June 23, 2004

ANALYTICAL METHODS SUMMARY

A4F150340

| <u>PARAMETER</u> | <u>ANALYTICAL METHOD</u> |
|---|------------------------------|
| Mercury in Liquid Waste (Manual Cold-Vapor) | SW846 7470A |

References:

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

SAMPLE SUMMARY

A4F150340

| <u>WO #</u> | <u>SAMPLE#</u> | <u>CLIENT SAMPLE ID</u> | <u>SAMPLED DATE</u> | <u>SAMP TIME</u> |
|-------------|----------------|-------------------------|---------------------|------------------|
| GJC1P | 001 | 109-1/2/3/4 | 06/03/04 | |

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

SAIC - NASA-GRC

Client Sample ID: 109-1/2/3/4

TCLP Metals

Lot-Sample #...: A4F150340-001

Matrix.....: SO

Date Sampled...: 06/03/04

Date Received...: 06/04/04

Leach Date.....: 06/16/04

Leach Batch #...: P416807

| <u>PARAMETER</u> | <u>RESULT</u> | <u>REPORTING</u> <u>LIMIT</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION-</u> <u>ANALYSIS DATE</u> | <u>WORK</u> <u>ORDER #</u> |
|--------------------------|---------------|----------------------------------|--------------|---------------|---|-------------------------------|
| Prep Batch #...: 4169012 | | | | | | |
| Mercury | ND | 0.0020 | mg/L | SW846 7470A | 06/17/04 | GJC1P1AA |
| | | Dilution Factor: 1 | | | | |

NOTE (S) :

Analysis performed in accordance with USEPA Toxicity Characteristic Leaching Procedure Method 1311

METHOD BLANK REPORT

TCLP Metals

Client Lot #....: A4F150340

Matrix.....: SOLID

| <u>PARAMETER</u> | <u>RESULT</u> | <u>REPORTING</u> <u>LIMIT</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION-</u> <u>ANALYSIS DATE</u> | <u>WORK</u> <u>ORDER #</u> |
|------------------|---------------|----------------------------------|--------------|---------------|---|-------------------------------|
| MB Lot-Sample #: | A4F160000-332 | Prep Batch #....: | 4169012 | | | |
| Leach Date.....: | 06/16/04 | Leach Batch #....: | P416807 | | | |
| Mercury | ND | 0.0020 | mg/L | SW846 7470A | 06/17/04 | GJEQR1AA |
| | | Dilution Factor: 1 | | | | |

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

METHOD BLANK REPORT

TCLP Metals

Client Lot #....: A4F150340

Matrix.....: SOLID

| <u>PARAMETER</u> | <u>RESULT</u> | <u>REPORTING LIMIT</u> | <u>UNITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>WORK ORDER #</u> |
|--------------------------------|---------------|----------------------------|--------------|---------------|---------------------------------------|-------------------------|
| MB Lot-Sample #: A4F170000-012 | | Prep Batch #....: 4169012 | | | | |
| Mercury | ND | 0.0020 | mg/L | SW846 7470A | 06/17/04 | GJF0D1AA |
| | | Dilution Factor: 1 | | | | |

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

TCLP Metals

Client Lot #...: A4F150340

Matrix.....: SOLID

| <u>PARAMETER</u> | <u>PERCENT RECOVERY</u> | <u>RECOVERY LIMITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>WORK ORDER #</u> |
|--------------------------------|-----------------------------|----------------------------|--------------------------|---------------------------------------|---------------------|
| ICS Lot-Sample#: A4F170000-012 | | | Prep Batch #...: 4169012 | | |
| Mercury | 116 | (50 - 150) | SW846 7470A | 06/17/04 | GJF0D1AK |
| | | Dilution Factor: 1 | | | |

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

TCLP Metals

Client Lot #....: A4F150340

Matrix.....: SOLID

Date Sampled....: 06/14/04 12:00 Date Received...: 06/15/04

| <u>PARAMETER</u> | <u>PERCENT RECOVERY</u> | <u>RECOVERY LIMITS</u> | <u>RPD</u> | <u>RPD LIMITS</u> | <u>METHOD</u> | <u>PREPARATION- ANALYSIS DATE</u> | <u>WORK ORDER #</u> |
|------------------|-------------------------|------------------------|-------------------|-------------------|---------------|-----------------------------------|---------------------|
| MS Lot-Sample #: | A4F150295-001 | | Prep Batch #...: | | 4169012 | | |
| Leach Date.....: | 06/16/04 | | Leach Batch #...: | | P416807 | | |
| Mercury | 124 | (50 - 150) | | | SW846 7470A | 06/17/04 | GJCKPIAK |
| | 123 | (50 - 150) | 1.3 | (0-20) | SW846 7470A | 06/17/04 | GJCKPIAL |

Dilution Factor: 1

NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.