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Environmental Restoration Program

# CLOSURE REPORT
# BUILDING 51 - WASTE STORAGE TANK

## MOUND PLANT
## MIAMISBURG, OHIO

**August 1992**

**FINAL**

**(Revision 0)**

**Department of Energy**
**Albuquerque Field Office**

Environmental Restoration Program
Technical Support Office
Los Alamos National Laboratory

## TABLE OF CONTENTS


| Section | Title | Page |
|---|---|---|
| EXECUTIVE SUMMARY | | ES-1 |
| 1. | INTRODUCTION | 1-1 |
| 1.1. | Closure Report Scope and Objectives | 1-1 |
| 1.1.1. | CERCLA Removal Site Evaluation | 1-1 |
| 1.1.2. | Need for Further Investigations | 1-1 |
| 1.2. | Environmental Restoration Program Description and Mound Plant Background | 1-2 |
| 1.3. | Tank Site History | 1-3 |
| 1.4 | Site Location and Setting | 1-5 |
| 1.5 | Site Geology | 1-7 |
| 2. | CONTAMINANT CHARACTERIZATION | 2-1 |
| 2.1. | Field Sampling | 2-1 |
| 2.1.1. | Tank Removal Sampling | 2-1 |
| 2.1.2. | OU3 Limited Field Investigation Sampling (LF1) | 2-1 |
| 2.1.2.1. | OU3 Work Plan Consistency | 2-4 |
| 2.1.2.2. | Regulatory Agency Sampling Collection | 2-6 |
| 2.2 | Analytical Results | 2-6 |
| 2.2.1. | Engineering Program Tank Removal Results | 2-6 |
| 2.2.2. | OU3 Limited Field Investigation | 2-9 |
| 2.3. | OU3 Data Quality Summary | 2-9 |
| 3. | DISCUSSION | 3-1 |
| 3.1. | Comparison of Sampling and Analysis Efforts and Results | 3-1 |
| 3.2. | Removal Action Evaluation | 3-2 |
| 3.3. | Determination of a Need for Further Investigation or Remediation | 3-4 |
| 3.3.1. | ARAR Categories | 3-5 |
| 3.3.2. | Possible Action Levels | 3-6 |
| 3.4. | Future Comparison with ARARs and Risk-BAsed PRGs | 3-9 |
| 3.5. | Possible Data Gaps | 3-10 |
| 3.6. | Future Actions | 3-10 |
| 4. | CONCLUSIONS | 4-1 |
| 5. | REFERENCES | 5-1 |

APPENDIX A—BOWSER-MORNER, INC. PRELIMINARY CLOSURE SITE ASSESSMENT

APPENDIX B—OU3 LIMITED FIELD INVESTIGATION ANALYTICAL RESULTS

APPENDIX C—PRELIMINARY OU3 DATA QUALITY ASSESSMENT AND OU3 DATA VALIDATION RESULTS

## TABLE OF CONTENTS
(Continued)

## LIST OF FIGURES


| Figure | Title | Page |
|---|---|---|
| 1.1 | Regional Location of Mound Plant | 1-4 |
| 1.2 | Location of Building 51 Waste Storage Tank Site | 1-6 |
| 2.1 | Site Location Map, Bldg. 51 | 2-2 |
| 2.2 | Soil Excavation Sampling Locations, Bldg. 51 | 2-3 |


## LIST OF TABLES


| Table | Title | Page |
|---|---|---|
| II.1 | Summary of OU3 Soil Samples, Bldg. 51 | 2-5 |
| II.2 | Lab Results of Samples Collected During Tank Removal Activities, Bldg. 51 | 2-7 |
| II.3 | Data Summary Table for Volatile Organic Compounds, Bldg. 51 | 2-10 |
| II.4 | Data Summary Table for Semivolatile Organic Compounds, Bldg. 51 | 2-12 |
| II.5 | Data Summary Table for Pesticides and PCBs, Bldg. 51 | 2-15 |
| II.6 | Data Summary Table for Inorganics, Bldg. 51 | 2-16 |
| III.1 | Compounds Detected in Mound Plant Bldg. 51 Waste Storage Tank Soils Compared Selected Regulatory Thresholds | 3-7 |

## TABLE OF CONTENTS
(Continued)

## ACRONYM LIST

| | |
|---|---|
| ARAR | applicable or relevant and appropriate requirement |
| bgs | below ground surface |
| BUSTR | Bureau of Underground Storage Tank Regulation |
| CERCLA | Comprehensive Environmental Response, Compensation and Liability Act |
| CFR | Code of Federal Regulation |
| CSF | carcinogenic slope factors |
| DOE | U.S. Department of Energy |
| EP | Engineering Program |
| EPA | U.S. Environmental Protection Agency |
| ER | Environmental Restoration |
| FFA | Federal Facility Agreement |
| FID | flame ionization detector |
| FR | Federal Register |
| FY | fiscal year |
| LDR | Land Disposal Restrictions |
| LFI | Limited Field Investigation |
| mg/kg | milligrams per kilogram |
| NCP | National Contingency Plan |
| NPL | National Priorities List |
| OEPA | Ohio Environmental Protection Agency |
| OU | operable unit |
| PCB | polychlorinated biphenyl |
| PID | photoionization detector |
| PRG | preliminary remediation goals |
| QAPP | Quality Assurance Project Plan |
| RCRA | Resource Conservation and Recovery Act |
| RfD | reference dose |
| RI/FS | remedial investigation/feasibility study |
| RRU | relative response unit |
| sm/pp | Special Metallurgical/Plutonium Processing |
| SVOC | semivolatile organic compound |
| TBC | to be considered |
| TIC | tentatively identified compound |
| TPH | total petroleum hydrocarbons |
| UST | underground storage tank |
| VOC | volatile organic compound |
| $\mu$g/kg | micrograms per kilogram |

REVISED PAGES FOR THE MOUND CLOSURE REPORTS FOR THE BUILDING 34 AVIATION FUEL STORAGE TANK AND THE BUILDING 51 WASTE STORAGE TANK MADE IN RESPONSE TO UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS

AUGUST 1992 ISSUE*

| Revised Page(s) | Replaces Page(s) |
|---|---|
| **BUILDING 34** | |
| EXECUTIVE SUMMARY | |
| ES-1 - ES-2 | ES-1 - ES-2 |
| SECTION 1 | |
| 1-1 - 1-3, 1-6 - 1-7 | 1-1 - 1-3, 1-6 - 1-8 |
| SECTION 2 | |
| 2-1, 2-3, 2-6 - 2-15 | 2-1, 2-3, 2-6 - 2-14 |
| SECTION 3 | |
| 3-1 - 3-9 | 3-1 - 3-9 |
| SECTION 4 | |
| 4-1 | 4-1 |
| SECTION 5 | |
| 5-1 - 5-2 | 5-1 |
| APPENDIX A | |
| Add Bowser-Morner Transmittal Letter to front of Appendix A | |
| APPENDIX B | |
| No Replacements | |
| APPENDIX C | |
| C-1 - C-5 | C-1 - C-5 |
| **BUILDING 51** | |
| EXECUTIVE SUMMARY | |
| ES-1 - ES-2 | ES-1 - ES-2 |

REVISED PAGES FOR THE MOUND CLOSURE REPORTS FOR THE BUILDING 34 AVIATION FUEL STORAGE TANK AND THE BUILDING 51 WASTE STORAGE TANK MADE IN RESPONSE TO UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND OHIO ENVIRONMENTAL PROTECTION AGENCY COMMENTS

AUGUST 1992 ISSUE*

| Revised Page(s) | Replaces Page(s) |
|---|---|
| SECTION 1 | |
| 1-1 - 1-8 | 1-1 - 1-8 |
| SECTION 2 | |
| 2-1, 2-4, 2-6 - 2-17 | 2-1, 2-4, 2-6 - 2-15 |
| SECTION 3 | |
| 3-1 - 3-8 | 3-1 - 3-10 |
| SECTION 4 | |
| 4-1 | 4-1 |
| SECTION 5 | |
| 5-1 | 5-1 |
| APPENDIX A | |
| Add Bowser-Morner Transmittal Letter to front of Appendix A | |
| APPENDIX B | |
| No Replacements | |
| APPENDIX C | |
| C-1 - C-5 | C-1 - C-5 |

* No text changes were made to the August Final issues of these documents, only footer and page number revisions were made. The changes noted above reflect the changes between the April 1992 and July 1992 issues of these documents.

# EXECUTIVE SUMMARY

This report was specifically prepared for two purposes: 1) to evaluate the need to perform a removal action at the Building 51 former waste tank site at the Mound Plant in Miamisburg, Ohio, and 2) to present a preliminary determination of whether additional investigation or remedial action at this site is warranted. This report also documents the proper removal of an underground storage tank at Building 51 and documents the investigations of the soil contamination at the tank site.

## Removal Action

The Building 51 waste storage tank was installed in 1972 as a part of a waste incinerator facility in Building 51, which operated for approximately 1 year, at Mound Plant. The waste storage tank was used to hold waste oil and some waste solvents prior to incineration. The tank was removed in December 1990 by the Mound Plant Engineering Program (EP) in compliance with the Ohio Bureau of Underground Storage Tank Regulation (BUSTR) requirements. EP tank removal sampling was performed on December 4, 1990, by Bowser-Morner, Inc., an environmental subcontractor.

Following removal, the tank was decontaminated, and then cut up for salvage as scrap steel. The tank contents were turned over to the Mound Plant Waste Management Program which in turn disposed of the contents through a RCRA-approved disposal facility. The excavated soil was used as fill for the excavation site following the OU3 LFI sampling.

On the basis of the EP tank removal sampling results, which indicated elevated total petroleum hydrocarbon (TPH) levels in the soil below the tank, the U.S. Department of Energy (DOE) initiated Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) removal action activities to mitigate the apparent hazard posed by the contaminated soil. Removal action activities included a site evaluation in accordance with 40 Code of Federal Regulation (CFR) 300.410, and preliminary planning for a removal action.

In addition to the EP tank removal sampling results, the DOE received final validated results from soil sampling conducted at the Building 51 former tank site in August 1991 as a part of the Operable Unit (OU) 3 Limited Field Investigation (LFI). These results confirm the presence of trace amounts of a few volatile organic compounds (VOC), semivolatile organic compounds (SVOC), polychlorinated biphenyls (PCB), petroleum hydrocarbons, and metals in the former tank site soils. Specific compounds detected included: acetone, carbon disulfide, chloroform, methyl ethyl ketone, trichloroethene, acenapthene, fluoranthene, pyrene, butylbenzylphthalate, Aroclor 1254, and various metals such as beryllium, chromium and lead.

Based on a review of available soil contaminant data and potential routes of exposure pursuant to the CERCLA removal site evaluation requirements of 40 CFR 300.410, a removal action is not considered necessary because there is no imminent and substantial danger to the public health or welfare posed by the released hazardous substances.

## Need for Additional Investigations

The second objective of this report is to assist the OU3 LFI effort by providing a preliminary determination of the need to conduct further investigation or remedial actions at the former tank site. Because action levels based on federal or state applicable or relevant and appropriate requirements (ARAR) or on risk studies have not yet been established at Mound Plant, the LFI determination presented in the report will be subject to re-evaluation as action levels are developed. Lacking established Plant-wide action levels, the Building 51 former tank site soil data were compared to possible action levels. Possible action levels used in this report were developed using available regulatory and policy thresholds that include:

- Proposed Resource Conservation and Recovery Act (RCRA) 40 CFR 264 Subpart S action levels for soils.
- RCRA land disposal restriction treatment standards for waste code F039.
- Ohio Environmental Protection Agency (OEPA) petroleum soil clean-up policy standards.

When soil contaminant data are compared with the possible action levels, beryllium, which was found in concentrations up to 0.94 milligrams per kilogram (mg/kg), exceeds the 40 CFR Subpart S action level of 0.2 mg/kg. Applying the equation used to derive the possible action level, the maximum concentration of beryllium detected equates to a carcinogenic risk of $5.8 \times 10^{-6}$ (5.8 cases per 1,000,000 exposed people). No contaminants were identified above the land disposal restriction treatment standards. The total petroleum hydrocarbon (TPH) results were found to exceed the OEPA policy standard of 40 mg/kg; however, the more toxic constituents of concern at Mound Plant comprising TPH did not include significant quantities of the more toxic VOCs and SVOCs of concern at Mound Plant.

Based on this analysis, it is concluded that no need exists to conduct further investigation at the Building 51 former tank site, nor will there be a need to conduct remedial actions. This conclusion will be re-evaluated based on the results of background sampling and the development of Mound Plant action levels. DOE has committed to retaining the tank site soil data in the OU3 Remedial Investigation where it will be addressed in the risk assessment/risk management process (DOE, 1992a).

# 1. INTRODUCTION

## 1.1. CLOSURE REPORT SCOPE AND OBJECTIVES

This report is called a "closure report" because it is intended to document the proper removal of the Building 51 waste tank and to further document that previous investigation of the site indicates no additional actions are necessary. The purpose of this report is to evaluate the tank site relative to the two issues discussed in Sections 1.1.1. and 1.1.2.

### 1.1.1. CERCLA Removal Site Evaluation

The first objective of this report is to review the initial evaluation of the Building 51 former tank site and present the decision of the U.S. Department of Energy (DOE) regarding a removal action at the site. In performing its evaluation, the DOE has accomplished a removal site evaluation according to 40 Code of Federal Regulations (CFR) 300.410 of the National Contingency Plan (NCP). The removal evaluation has been based on readily available information and collected or reviewed data such as: site contamination data, site management practices, generator supplied information, historic photograph analysis, literature searches, and personal interview records.

In the summer of 1991, the DOE announced its intention to conduct a removal action at the Building 51 former waste tank site to mitigate the apparent hazard posed by soil contaminated with hazardous substances released from the tank. Shortly thereafter, the DOE received preliminary information from the Operable Unit (OU) 3 Limited Field Investigation (LFI) that indicated a removal action might not be necessary. Final validated results from the OU3 LFI were received on March 4, 1992. Using the OU3 LFI analytical data and the data available from the investigation conducted during the tank removal activities in December 1990, the DOE is now able to evaluate the risk posed by tank site soils and determine the need for a removal action.

### 1.1.2. Need for Further Investigations

The second objective of this report is to provide a preliminary determination of the need to conduct further investigation or remedial actions at the tank site. However, because action levels based on applicable or relevant and appropriate requirements (ARAR) or risk studies have not yet been established at Mound Plant, the LFI determinations presented in this report will be subject to re-evaluation as action levels are developed. Moreover, DOE has committed to retaining the tank site soil

data in the OU3 Remedial Investigation where it will be addressed by the risk assessment/risk management process (DOE, 1992a).

In addition to this Closure Report, an additional report covering all the sampling and analysis completed for all the potential release sites within OU3 will be prepared in two steps. First, when all of the analyses have been completed and all of the data have been validated, a letter report is planned for issue during fiscal year (FY) 1992. This letter report will make conclusions about any readily apparent, significant contamination indicating that immediate action (either a work plan or a Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] removal action) is warranted. Second, a comprehensive OU3 LFI report is scheduled to be started in October 1993 (FY 1994).

## 1.2. ENVIRONMENTAL RESTORATION PROGRAM DESCRIPTION AND MOUND PLANT BACKGROUND

Mound Plant was placed on the National Priorities List in November 1989. Pursuant to that status, the DOE and the U.S. Environmental Protection Agency (EPA) signed a CERCLA Section 120 Federal Facility Agreement (FFA), Administrative Docket Number V-W-90-C-075, that became effective October 12, 1990. As a result of this, the remedial investigation/feasibility study (RI/FS) process at Mound Plant follows the methodology that the NCP (i.e., Superfund) has established for characterizing the nature and extent of risks posed by uncontrolled hazardous waste sites and for evaluating potential remedial options.

The goal of the Environmental Restoration (ER) Program at Mound Plant is to reduce adverse impacts on the public and the environment by reducing releases of hazardous or radioactive materials, and then bring all inactive waste sites requiring remediation into compliance with existing state and federal ARARs. These goals will be accomplished, in part, by the following activities, which stem from the RI/FS process:

- Investigating the nature and extent of contamination.
- Performing risk assessment(s) to identify and evaluate potential threats to human health and the environment.
- Developing and evaluating remedial action alternatives to reduce these threats to acceptable levels.
- Implementing the selected remedial actions.

The FFA contains both the procedural and substantive requirements for RI/FS work. The DOE is proposing the RI/FS activities for a broad geographic area, including the area within the Mound Plant as well as areas beyond the Mound Plant boundaries. Because of the size and the complexity of the RI/FS, the Mound Plant has been divided into nine OUs to facilitate management of the RI/FS. Underground storage tank (UST) sites have been allocated to various OUs, as appropriate, according to their location and relationship to activities within the units. (The Building 51 former tank site is currently assigned to OU3).

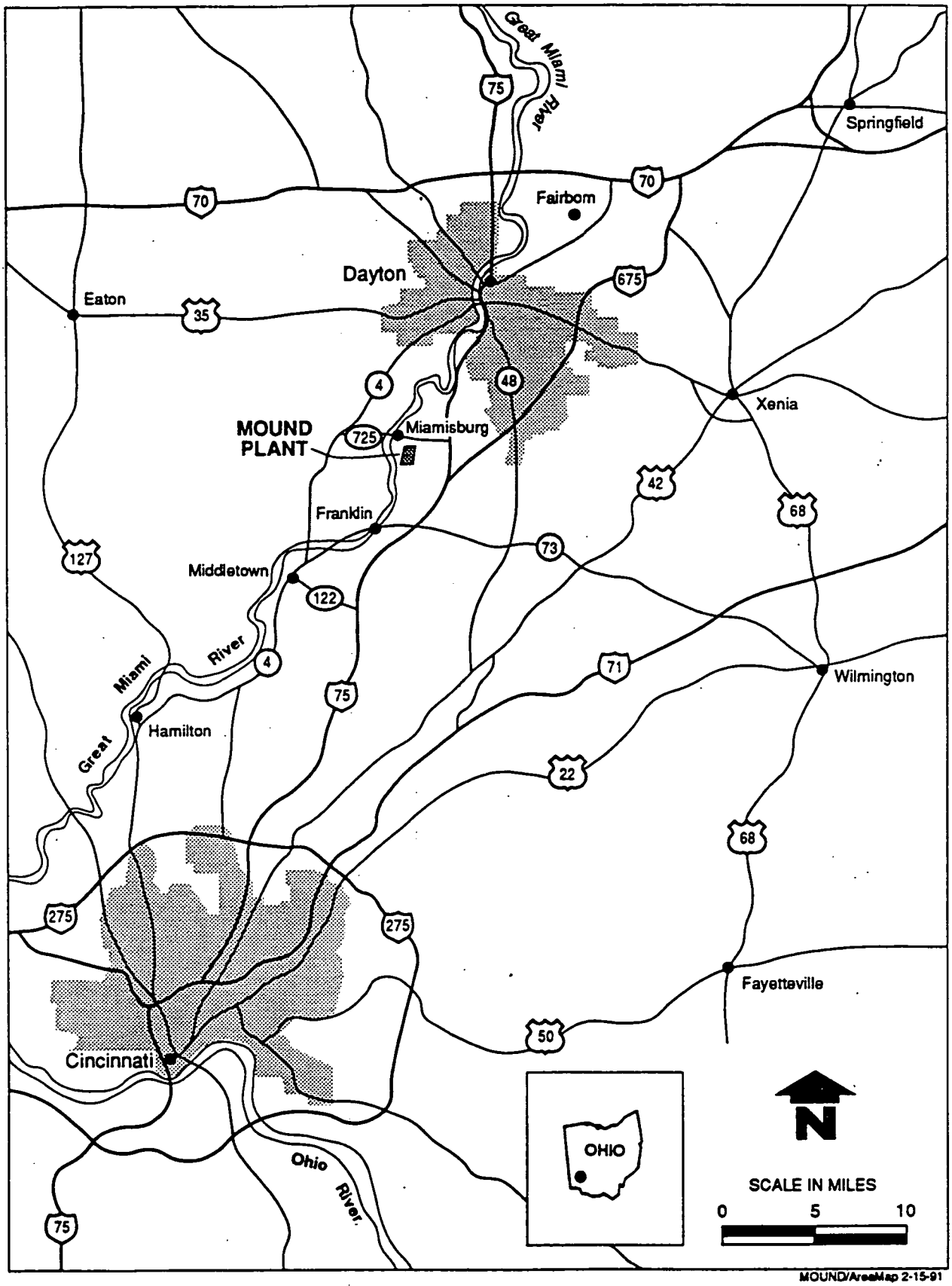
Mound Plant was formed as a technical organization in 1943 to determine the chemical and metallurgical properties of polonium as part of the Manhattan Engineering District (DOE, 1986). This work was conducted for the U.S. Army at several locations in the Dayton, Ohio, area. In 1946, 182 acres adjacent to the city of Miamisburg, Ohio, were purchased for the permanent Mound Plant site (Figure 1.1). Work being conducted at the Dayton units was moved to Mound Plant in 1948. The total acreage of Mound Plant was later expanded to 305 acres; however, there was no development on the new property.

The successive United States government agencies that have owned Mound Plant are: the Manhattan Engineering District, the Atomic Energy Commission, the Energy Research and Development Agency, and the DOE. The Monsanto Research Corporation operated Mound Plant for each of these agencies until December 1988, when it was succeeded by EG&G Mound Applied Technologies.

Mound Plant is currently an integrated research, development, and production facility, which operates in support of the DOE weapons and energy programs (DOE, 1986). Mound Plant manufactures non-nuclear components and tritium-containing components for nuclear weapons, and also develops small heat sources for the space and defense programs.

## 1.3. TANK SITE HISTORY

The Building 51 waste storage tank was located adjacent to Building 51 in the valley between the Main Hill and the Special Metallurgical/Plutonium Processing (SM/PP) Hill (Figure 1.2). The tank was part of a waste incinerator facility at Building 51 and was probably installed at the same time as the incinerator that it fed. The incinerator was completed in 1972 and only operated for a total of approximately 1 year. It was used to burn nearly all of the Plant's nonradioactive solid wastes and some liquids including oils, paints, and solvents on an experimental basis, but most liquids were shipped off-plant for disposal. A scrubber system was installed in 1974 to reduce emissions and the unit operated for a few months thereafter. The overall operation of the incinerator was not successful




MOUND/AreaMap 2-15-91

**Figure 1-1** Regional location of Mound Plant.

and its use was discontinued because of excessive releases of particulates and of changes in air pollution control regulations. The unit and the scrubber were dismantled in the late 1970s or early 1980s (DOE, 1991d).

The 1,000-gallon underground waste tank was primarily used to store waste oils and also waste organic solvents from various Mound Plant processes. Liquid waste was pumped from the tank to the incinerator to be burned. Materials stored in the tank are believed to have included: waste petroleum oils (various types); waste solvents including trichloroethene, acetone, toluene, and benzene; and other flammable materials such as enamel and lacquer paints, lacquer thinner, methanol, ethanol, and mineral spirits. Waste oil reportedly comprised the majority of the waste, with solvents being a minor constituent; however, there are no records to confirm this.

The Building 51 waste storage tank was removed by the Engineering Program (EP) in December 1990 as part of the Mound Plant underground tank program. Prior to the removal, notice was provided to the Ohio Department of Commerce, Division of the State Fire Marshall, Bureau of Underground Storage Tank Regulation (BUSTR). In addition, notice that the Building 51 tank was being removed was provided to the Ohio Environmental Protection Agency (OEPA), Division of Emergency and Remedial Response.

Based upon the EP tank removal report (Bowser-Morner, 1991), the tank was in poor condition with heavy corrosion and numerous holes. Although the tank was only operational for a short time, it is evident that some leakage may have occurred while the tank was in the ground and out of service. An undetermined amount of sludge material remained in the tank at the time of removal, which is consistent with reports that the tank was pumped out to the capabilities of the system when the tank was taken out of service. Therefore, between 1972 and 1990, there was a limited potential for leakage of residual materials to occur. Both the sludge and the surrounding soil were sampled as a part of the EP tank removal; analytical results are discussed in Section 2.2.

## 1.4. SITE LOCATION AND SETTING

The Building 51 former waste storage tank site is located adjacent to Building 51 in the upper valley between the Main Hill and the SM/PP Hill (Figure 1.2). The upper valley area is located in the northeastern portion of the Mound Plant site, south of the north parking lot area. Currently, the area is largely comprised of service buildings, paved parking lots, and an asphalt-lined pond built on fill materials. The upper valley area has undergone numerous changes to accommodate plant growth and has a long history of debris disposal (DOE, 1991c). Much of the disposal appears to have included

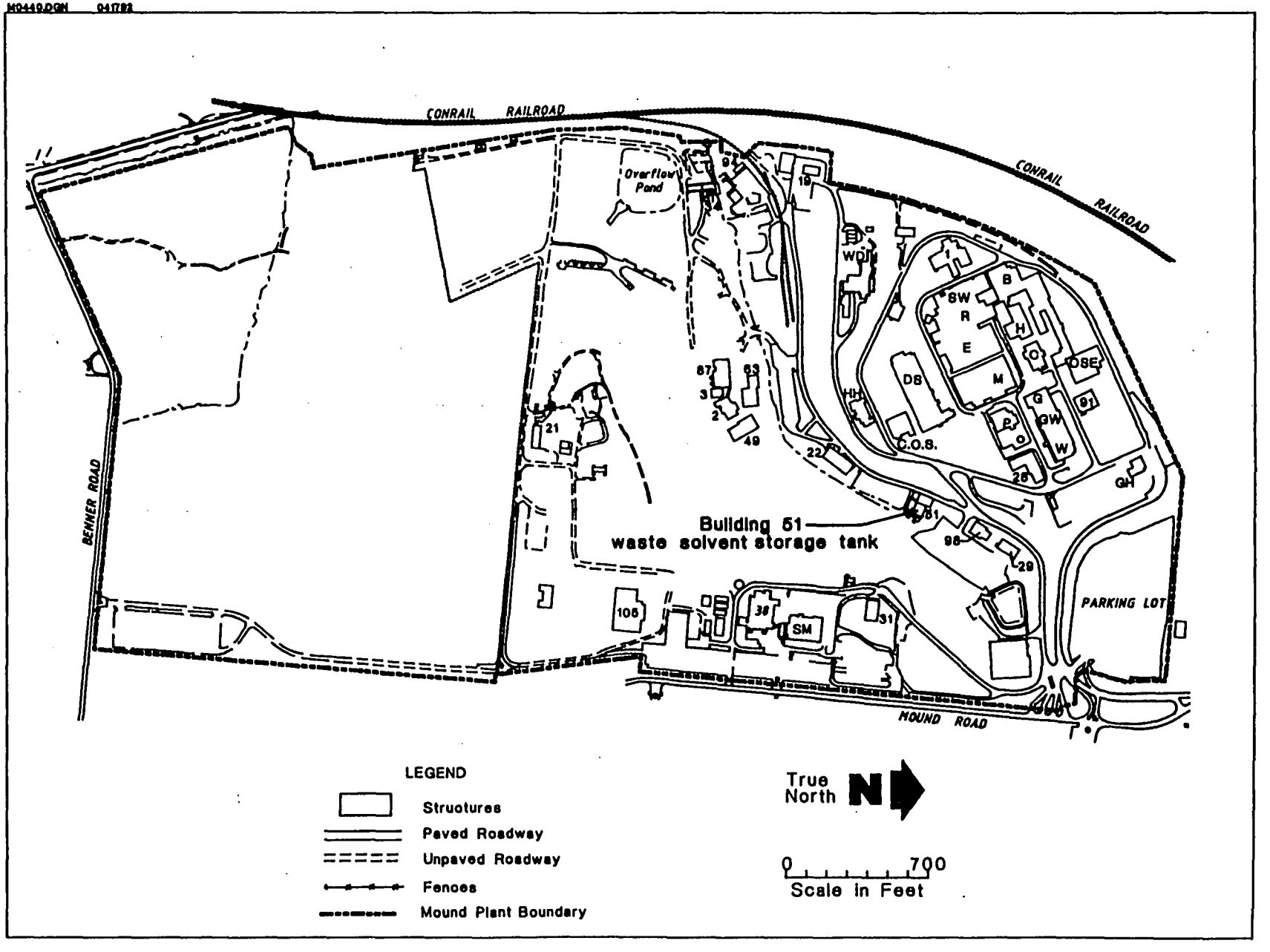



FIGURE 1.2 Location of Building 51 Waste Storage Tank Site

materials dumped over the sides of the western slopes so that the debris moves easterly into the drainage channel.

The Building 51 waste storage tank was installed as a part of an incinerator facility in Building 51, completed sometime around 1972, and appears to have been built on the lower channel fill terrace. The building and the immediate area surrounding it appear to have been relatively undisturbed until 1979. The activities involved with the disturbance between 1979 and 1981 are currently unknown, but may be related to the construction of sewer and drain lines installed beneath the paved parking lots.

## 1.5. SITE GEOLOGY

The Building 51 waste storage tank is located in the east–west trending tributary valley that occupies lowland between the two hills at Mound Plant (DOE, 1991b). The valley is underlain by unconsolidated deposits that vary in thickness from 20 feet to greater than 75 feet. The thickness of these deposits increases to the west toward the ancestral valley of the Great Miami River. Deposits within the tributary valley include silt, sand, and gravel; in general, the sequence coarsens downward. Permeable layers of sand and gravel are common at depths greater than 30 feet.

The modern Great Miami River occupies an ancient valley that was formed by meltwater from continental glaciers. The valley is filled with thick, extensive glacial deposits of permeable sand and gravel that are referred to as the Buried Valley Aquifer, which is an important groundwater resource (DOE, 1989). Two distinct layers of sand and gravel, separated by glacial till, have been identified in geologic logs from off-site monitoring wells located in the Buried Valley Aquifer. Deposits in the Buried Valley Aquifer reach a maximum thickness of greater than 150 feet, and are underlain by approximately 3,400 feet of flat-lying Cambrian and Ordovician-age marine shales and limestones. The site hydrogeology, including groundwater flow and quality, is discussed in the RI/FS work plan (DOE, 1991b).

According to a geologic log completed for a soil boring/monitoring well (#0111) located near the Building 51 waste storage tank site, soils in the vicinity are generally comprised of brown to dark gray gravelly clay fill to a depth of approximately 17 feet below ground surface (bgs) (DOE, 1992b). Soils between 17 and 22 feet bgs consist of gray to light brown, sandy, gravelly silt. Alternating layers of light brown to brown sand and gravelly silt occupy the depths between 22 and 34 feet bgs. Soils from 34 to 62 feet bgs are generally light brown to reddish brown gravelly sand and coarse-grained sand

occupies the area between 62 and 67 feet bgs. The layers below the fill correspond to the unconsolidated deposits common to the area near the Great Miami River.

The fill consists of up to 20% gravel up to 1.5 inches in diameter. The gravelly silt from 17 to 22 feet bgs is poorly graded, nonstratified, and consists of approximately 20% gravel up to 1.5 inches in diameter. The sand is moist, poorly graded, nonstratified, and approximately 30% gravel up to 1.5 inches in diameter. Based upon available monitoring well information, groundwater may be encountered at approximately 53 feet bgs.

# 2. CONTAMINANT CHARACTERIZATION

## 2.1. FIELD SAMPLING

The Building 51 waste tank site has recently been the subject of two field investigations. The first investigation was conducted as a part of Mound Plant EP tank removal activities in late 1990. The second investigation took place in August 1991 as part of the OU3 LFI. The sampling practices used in these investigations are described below in Sections 2.1.1. and 2.1.2.; analytical results for both investigations are presented in Section 2.2.

### 2.1.1. Tank Removal Sampling

As described by Bowser-Morner, Inc., the contents of the waste tank were sampled on October 26, 1990 (Bowser-Morner, 1991). A sludge sample was collected through the tank fill pipe opening using a pre-cleaned bailer and was analyzed by Bowser-Morner, Inc. for volatile organics, heavy metals, total petroleum hydrocarbons (TPH), phenol, cyanide, sulfide, total solids, polychlorinated biphenyls (PCB), pH, and flashpoint.

The waste tank system at Building 51 was removed by the Mound Plant EP on December 4, 1990. Once the tank was removed, three soil samples were collected in the excavation pursuant to Ohio State Fire Marshal and OEPA guidelines. One soil sample was collected at each end of the concrete tank pad at an approximate depth of 8 to 8½ feet bgs, and one soil sample was collected from the middle of the pad at an approximate depth of 7 feet bgs, for a total of three samples. (Shown in Figures 2.1 and 2.2).

Soil samples collected from the tank excavation were analyzed by Bowser-Morner, Inc. for volatile organics, heavy metals, TPH, phenol, cyanide, sulfide, total solids, PCBs, pH, and flashpoint.

Excavated soils and soil samples were monitored using a photoionization detector (PID). Although PID measurements of excavation soils ranged up to 15 relative response units (RRU), PID measurements for the samples were each found to be 4 RRU.

### 2.1.2. OU3 Limited Field Investigation Sampling

On August 28, 1991, as part of the OU3 LFI, Mound Plant and Roy F. Weston, Inc. (WESTON) personnel were on site to observe the re-opening of the December 1990 excavation associated with the Building 51 waste tank removal. Because the hole excavated to remove the tank was never

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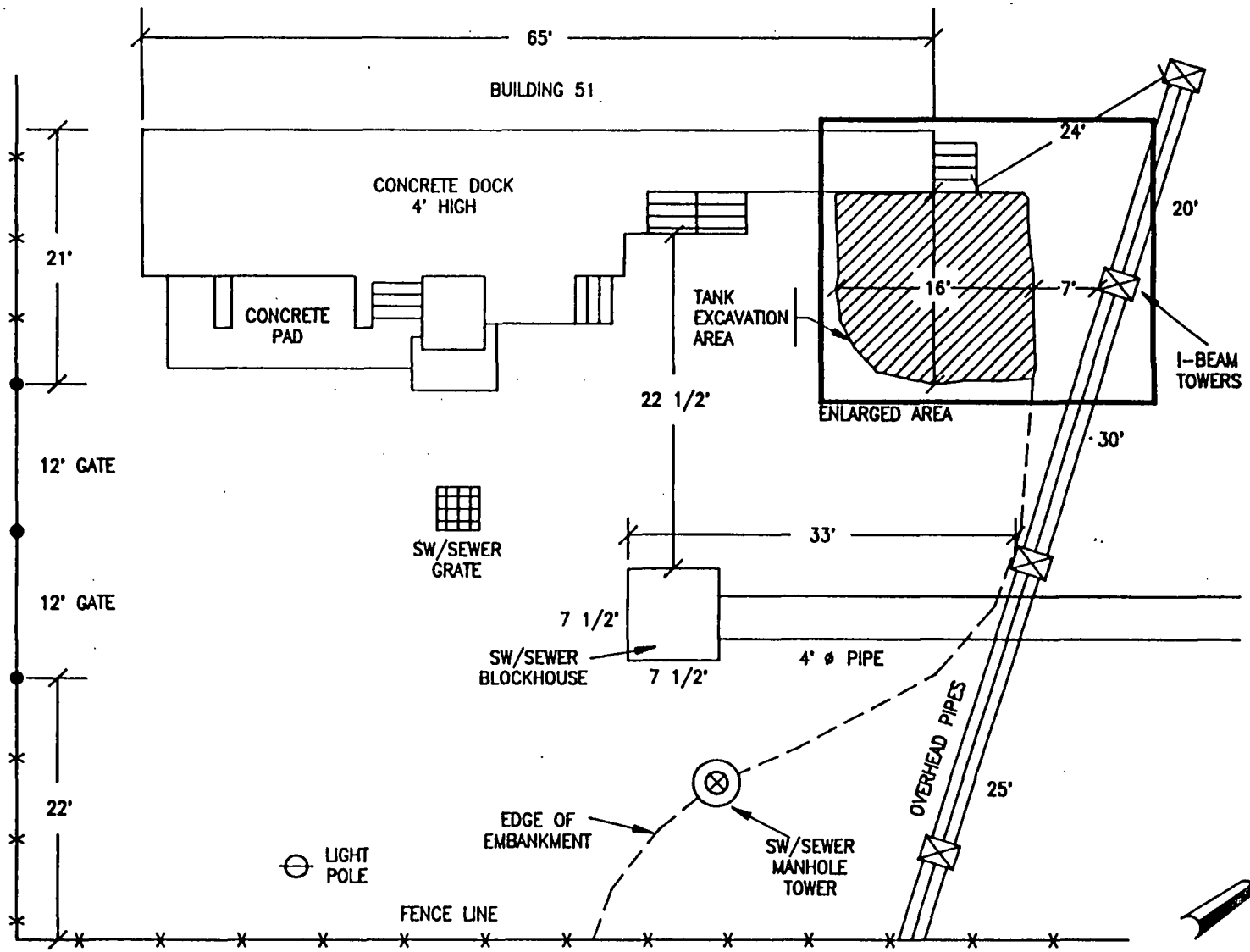


| MOUND PLANT REMOVAL ACTION PLAN | SITE LOCATION MAP BUILDING 51 WASTE STORAGE TANK EXCAVATION AREA | FIGURE 2-1 |
|---|---|---|

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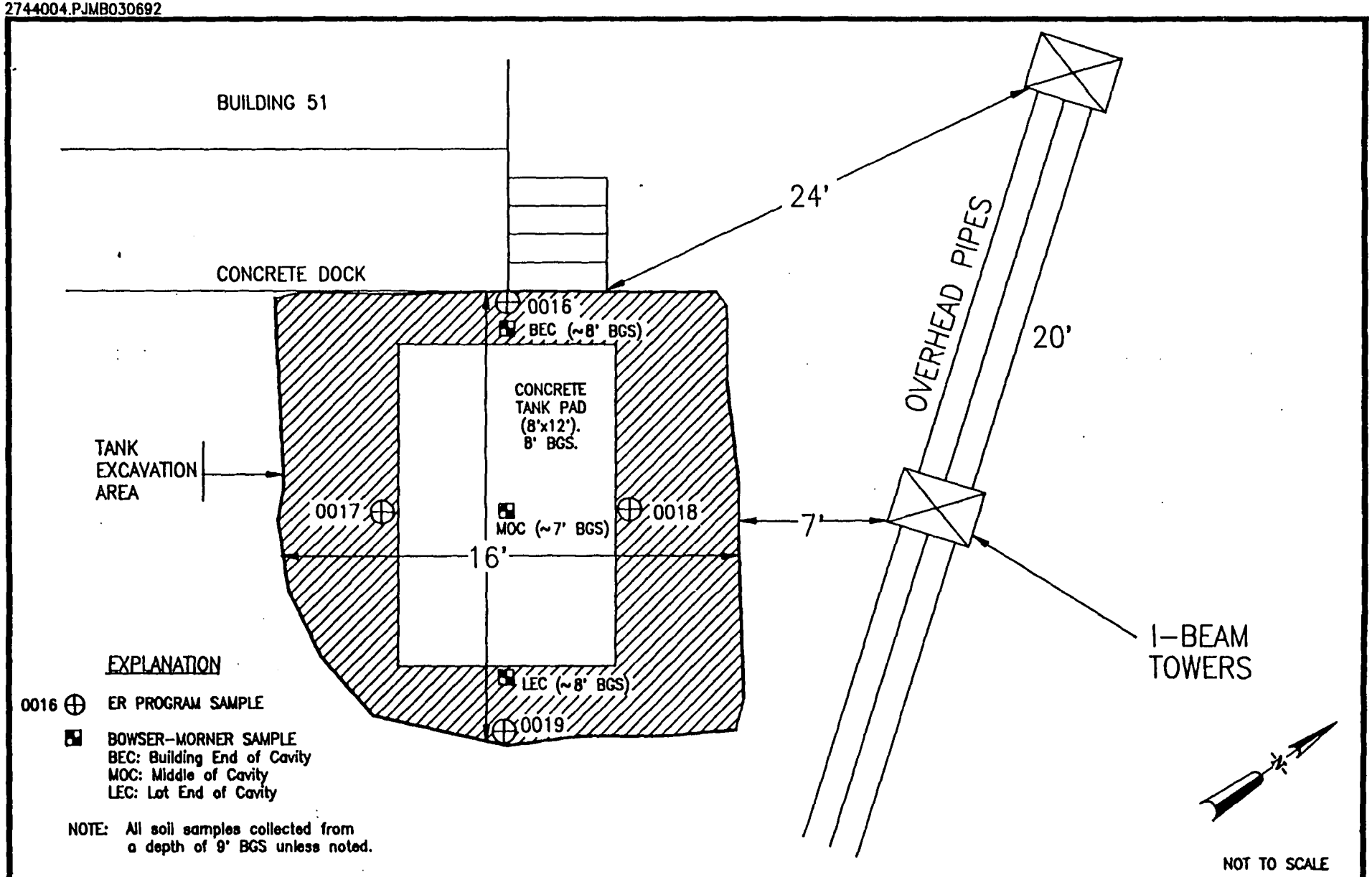


| MOUND PLANT<br>ENVIRONMENTAL RESTORATION PROGRAM<br>CLOSURE REPORT | SOIL EXCAVATION SAMPLING LOCATIONS<br>BUILDING 51<br>WASTE STORAGE TANK EXCAVATION AREA | FIGURE<br>2-2 |
|---|---|---|

backfilled, the re-opening involved additional excavation because the walls of the original hole were caving in. This new excavation was 16 feet wide by 16 feet long and 8 feet deep. An approximately 1-foot thick concrete tank pad was discovered at a depth of 8 feet bgs. The dimensions of the pad were 8 feet by 12 feet. Overexcavation of approximately 2 feet away from and 1 foot below the pad was performed prior to sampling, where possible.

Observations in the field included discovery of stained, dark gray clayey soils at a depth of 8 feet bgs surrounding all sides of the concrete pad. Subsurface samples were collected and screened for volatile organic compounds (VOC) using a PID and a flame ionization detector (FID). Soil samples were collected with a stainless steel scoop from a backhoe bucket. The backhoe was used to collect soils from central locations from each of the four excavation walls at a depth of approximately 9 feet bgs. Sampling personnel could not enter the excavation due to the height and potential instability of the excavation walls. The walls of the excavation could not be adequately sloped for entry due to the proximity of utilities. The sample locations are shown in Figures 2.1 and 2.2. All samples collected by WESTON were shipped to IT Corporation Laboratories, Oak Ridge, Tennessee, for analyses.

A summary of soil samples collected at the Building 51 site during the OU3 LFI is presented in Table II.1 and includes the sample identification number, sample interval or type of sample, date collected, and analytical testing parameters requested.

#### 2.1.2.1. OU3 Limited Field Investigation Work Plan Consistency

The following is a summary of points of variance within the OU3 LFI Work Plan (DOE, 1991a). Except as noted, sampling was consistent with the referenced Work Plan.

- At the request of OEPA, the sampling depth for all soil samples below the base of the excavation at the Building 51 waste tank site was extended deeper than the 0 to 6 inches specified in the Work Plan due to the possible loss of VOCs after the tank was excavated. Except for caving of the sides, the excavation had remained open since tank removal activities in December 1990.

- Due to underground utilities in the area, the excavation could not be sloped to allow access by soil samplers as prescribed in the Work Plan; therefore, soil samples were collected from the center of the backhoe bucket after it picked up soil from the designated locations.

- The sampling protocol was modified to collect samples from the sides of the in-place tank foundation pad that the Work Plan did not anticipate. The Work Plan specified one sample from each end of the tank pit, one sample from the middle of the excavation, and one sample from beneath a joint in the piping leading from the tank.

Table II.1

Summary of Soil Samples, Bldg. 51
OU3 Limited Field Investigation

| Sample Location | Sample Number | Sample Description |
|---|---|---|
| Location 0016 | MND33-0016-0001 (MND33-0016) | Interval 1 to 2 feet below base of excavation next to cement foundation pad; 28 August 1991; analyses requested – TCL VOCs, SVOCs, and Pesticides/PCBs, TAL Metals (including cyanide). |
| | MND33-0016-5001 | Ambient blank; 28 August 1991; analyses requested – TCL VOCs. |
| Location 0017 | MND33-0017-0001 (MND33-0017) | Interval 1 to 2 feet below base of excavation next to cement foundation pad, 28 August 1991; analyses requested – TCL VOCs, SVOCs, and Pesticides/PCBs, TAL Metals (including cyanide). |
| Location 0018 | MND33-0018-0001 (MND33-0018) | Interval 1 to 2 feet below base of excavation next to cement foundation pad; 28 August 1991; analyses requested – TCL VOCs, SVOCs, and Pesticides/PCBs, TAL Metals (including cyanide). |
| Location 0019 | MND33-0019-0001 (MND33-0019) | Interval 1 to 2 feet below base of excavation next to cement foundation pad; 28 August 1991; analyses requested – TCL VOCs, SVOCs, and Pesticides/PCBs, TAL Metals (including cyanide). |
| | MND33-0019-1001 | Interval 1 to 2 feet below base of excavation next to cement foundation pad. (Duplicate); 28 August 1991; analyses requested – TCL VOCs, SVOCs, and Pesticides/PCBs, TAL Metals (including cyanide). |

TCL = Target Compound List
VOC = volatile organic compound
SVOC = semivolatile organic compound
PCB = polychlorinated biphenyl
TAL = Target Analyte List

#### 2.1.2.2. Regulatory Agency Sample Collection

An OEPA representative was on site to observe OU3 sampling activities and to collect split samples at the Building 51 site. The split samples taken at sample locations 0016 and 0019 were analyzed for VOCs, pesticides/PCBs, and metals (including cyanide).

OEPA split sample results serve as an additional quality control check for ER Program sampling and analysis; however, such split samples were not necessarily sampled nor analyzed in accordance with the OU3 Quality Assurance Project Plan (QAPP; DOE, 1991e). Consequently, the validity of the OEPA data cannot be ascertained; OEPA split sample data are provided in this report for completeness and are regarded as estimated.

## 2.2. ANALYTICAL RESULTS

Sections 2.2.1. and 2.2.2. present the analytical results of the investigations described in Section 2.1.

### 2.2.1. Engineering Program Tank Removal Results

Table II.2 provides the laboratory results from the EP tank removal investigation for the sludge and soil samples collected at the Building 51 waste tank site. As noted in the table, the tank contents (sludge) were found to contain low concentrations of VOCs including: benzene, chloroform, ethylbenzene, methylene chloride, tetrachloroethylene, toluene, trans-1,2-dichloroethylene, 1,1,1-trichloroethane, trichloroethylene, xylene, acetone, methyl ethyl ketone, and methyl isobutyl ketone. The following metals were detected: chromium, lead, sodium, iron, and manganese; TPH and trace Aroclor 1260 were also detected.

VOCs identified in the soil samples included chloroform and trichloroethylene in the samples taken from nearest the building (BEC) and from the middle of the concrete pad (MOC) (Figure 2.2). Each metal analyzed for was detected with the exception of selenium and silver. The highest TPH value, 560 milligrams per kilogram (mg/kg), was found in the sample from the middle of the concrete pad. Aroclor 1254 was reported in a trace concentration in the sample from nearest Building 51.

Laboratory reports for the EP tank removal results are provided in Appendix A. No laboratory precision and accuracy information was available for the tank removal analysis. As was the case with the OEPA split sample data, the EP tank removal sampling and analyses were not performed in accordance with the QAPP. Consequently, the EP analytical results are regarded as estimated.

Table II.2
Laboratory Results of Soil and Sludge Samples Collected
During Engineering Program BUSTR Tank Removal
Building 51 - Waste Storage Tank

| PARAMETER | Unit | Building End of Cavity | Middle of Cavity | Lot End of Cavity | Sludge (mg/L) |
|---|---|---|---|---|---|
| Benzene | ug/kg | <2 | <2 | <2 | 0.0396 |
| Chloroform | ug/kg | 21 | 21 | <10 | 0.0129 |
| Ethylbenzene | ug/kg | <2 | <2 | <2 | 0.22 |
| Methylene chloride | ug/kg | <50 | <50 | <50 | 0.26 |
| Tetrachloroethylene | ug/kg | <25 | <25 | <25 | 0.0076 |
| Toluene | ug/kg | <2 | <2 | <2 | 1.9 |
| Trans-1,2-Dichloroethylene | ug/kg | <25 | <25 | <25 | 0.162 |
| 1,1,1-Trichloroethane | ug/kg | <25 | <25 | <25 | 0.0104 |
| Trichloroethylene | ug/kg | 53 | 210 | <25 | 9.1 |
| Xylene | ug/kg | <2 | <2 | <2 | 2.4 |
| Acetone | ug/kg | <500 | <500 | <500 | 2000 |
| Methyl Ethyl Ketone | ug/kg | <1000 | <1000 | <1000 | 8.4 |
| Methyl Isobutyl Ketone | ug/kg | <500 | <500 | <500 | 13 |
| Mercury | mg/kg | 0.17 | 0.06 | 0.03 | <0.001 |
| Arsenic | mg/kg | 2.3 | 2.4 | 5.8 | <0.002 |
| Selenium | mg/kg | <0.4 | <0.4 | <0.4 | <0.05 |
| Silver | mg/kg | <2 | <2 | <2 | <0.1 |
| Barium | mg/kg | 16 | 8.5 | 38 | <0.1 |
| Cadmium | mg/kg | 0.61 | 0.44 | 0.41 | <0.01 |
| Chromium | mg/kg | 4.8 | 3.8 | 20 | <0.01 |
| Lead | mg/kg | 6.1 | 2.3 | 6.4 | <0.1 |
| Sodium | mg/kg | 95 | 140 | <10 | 510 |
| Iron | mg/kg | 5000 | 4800 | 21000 | 8.7 |
| Manganese | mg/kg | 100 | 120 | 470 | 0.13 |
| Total Petroleum Hydrocarbons | mg/kg | 75 | 560 | 35 | 48 |
| Phenol | mg/kg | <0.15 | <0.15 | <0.15 | <0.008 |
| Cyanide | mg/kg | <0.1 | <0.1 | <0.1 | <0.01 |

Table II.2 (Continued)
Laboratory Results of Soil and Sludge Samples Collected
During Engineering Program BUSTR Tank Removal
Building 51- Waste Storage Tank

| PARAMETER | Unit | Building End of Cavity | Middle of Cavity | Lot End of Cavity | Sludge (mg/L) |
|---|---|---|---|---|---|
| Sulfide | mg/kg | <1 | <1 | <1 | 18 |
| Total Solids | % | 93 | 96 | 87 | 143.30 |
| PCBs | mg/kg | 0.12 PCB1254 | <0.04 | <0.04 | 0.15 PCB1260 |
| pH | S.U. | 8.7 | 8.8 | 7.7 | 9.6 (S.U.) |
| Flash Point | degrees F | None to 210 | None to 210 | None to 210 | None to 210 |

Key

mg/kg = milligram per kilogram
mg/L = milligram per liter
S.U. = Standard Units
ug/kg = microgram per kilogram

Source: Bowser-Morner, 1991

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### 2.2.2. OU3 Limited Field Investigation

Tables II.3, II.4, II.5, and II.6 present the analytical results from the OU3 LFI for VOCs, semivolatile organic compounds (SVOC), pesticides/PCBs, and inorganics, respectively. VOCs that were detected included acetone, carbon disulfide, and 2-butanone (methyl ethyl ketone); all were detected in concentrations of 250 micrograms per kilogram (μg/kg) or less. SVOCs that were found included acenapthene, 4-bromophenyl-phenylether, fluoranthene, pyrene, and butylbenzylphthalate. Various metals and a pesticide (delta-BHC, with an estimated detection below the nominal detection limit) were also identified in the soil samples. With the exception of acetone and some metals, all were reported as estimated values often below the nominal detection limit.

On the basis of the internal laboratory quality assurance program, the data were sometimes qualified using letter codes, which are defined as follows:

- B – Analyte detected in laboratory blank.
- J – Value is considered estimated.
- U – Compound was analyzed for but not detected. The number is the method detection limit for the sample.
- X – Quantitation performed from secondary column.
- Y – Detection limit determined from secondary column. Peaks observed on primary column quantitated at less than contract-required detection limit on the secondary column.
- Z – No analytical result reported for this compound.

Analytical results presented in Tables II.3 through II.6 include or are a compilation of: Form I data, the data summary reported by the laboratory; validated data, evaluated in accordance with the OU3 QAPP, as discussed in Appendix C; and OEPA data, which are the results of the split sampling and analysis conducted by the State of Ohio. Laboratory results for the OU3 LFI are provided in Appendix B.

## 2.3. OU3 DATA QUALITY SUMMARY

In order to obtain data of sufficient quality to meet the objectives of the OU3 LFI, a system of quality controls and quality assessment was established in the OU3 QAPP (DOE, 1991e). Methods and procedures used in the field and the laboratory for collecting and analyzing soil samples from the Building 51 former tank site were reviewed and evaluated in accordance with the QAPP. Results of this review and evaluation are presented in preliminary form in Appendix C. A final report on the

Table II.3
Data Table For Volatile Organic Compounds, Bldg. 51*
0U3 Limited Field Investigation

| SAMPLE ID | 0016-0001 | | | 0017-0001 | | 0018-0001 | | 0019-0001 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ANALYTE | Validated Data (a) | Form I Data (b) | OEPA Data (c) | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) | OEPA Data (c) |
| Chloromethane | | 13 U | 10 | | 14 U | | 13 U | | 12 U | 10 |
| Bromomethane | | 13 U | 10 | | 14 U | | 13 U | | 12 U | 10 |
| Vinyl Chloride | | 13 U | 10 | | 14 U | | 13 U | | 12 U | 10 |
| Chloroethane | | 13 U | | | 14 U | | 13 U | | 12 U | 10 |
| Methylene Chloride | 6 U | 2 BJ | 940 | | 7 U | 6 U | 2 BJ | 6 U | 5 BJ | 430 |
| Acetone | 69 U | 69 B | 440 | 240 | 240 B | 250 | 250 B | | 200 B | 170 |
| Carbon Disulfide | | 6 U | 5 | | 4 J | | 6 U | | 6 U | 5 |
| 1,1-Dichloroethene | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| 1,1-Dichloroethane | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| 1,2 Dichloroethane (total) | | 6 U | | | 7 U | | 6 U | | 6 U | |
| Chloroform | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| 1,2-Dichloroethane | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| 2-Butanone | | 18 | 190 | | 70 | | 59 | | 53 | 100 |
| 1,1,1-Trichloroethane | | 6 U | 7 | | 7 U | | 6 U | | 6 U | 5 |
| Carbon Tetrachloride | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| Vinyl Acetate | | 13 U | 10 | | 14 U | | 13 U | | 12 U | 10 |
| Bromodichloromethane | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| 1,2-Dichloropropane | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| cis-1,3-Dichloropropene | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| Trichloroethene | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| Dibromochloromethane | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| 1,1,2-Trichloroethane | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| Benzene | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| trans-1,3-Dichloropropene | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| 2-Chloroethyl vinyl ether | | | 10 | | | | | | | 10 |
| Bromoform | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |

Table II.3 (Continued)
Data Table For Volatile Organic Compounds, Bldg. 51*
043 Limited Field Investigation

| SAMPLE ID | 0016-0001 | | | 0017-0001 | | 0018-0001 | | 0019-0001 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ANALYTE | Validated Data (a) | Form I Data (b) | OPEA Data (c) | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (a) | OPEA Data (c) |
| 4-Methyl-2-pentanone | | 13 U | 10 | | 14 U | | 13 U | | 12 U | 10 |
| 2-Hexanone | | 13 U | 10 | | 14 U | | 13 U | | 12 U | 10 |
| Tetrachloroethene | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| 1,1,2,2-Tetrachloroethane | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 5 |
| Toluene | | 6 U | 25 | | 7 U | | 6 U | | 6 U | 16 |
| Chlorobenzene | | 6 U | 14 | | 7 U | | 6 U | | 6 U | 12 |
| Ethylbenzene | | 6 U | 8 | | 7 U | | 6 U | | 6 U | 6 |
| Styrene | | 6 U | 5 | | 7 U | | 6 U | | 6 U | 6 |
| Xylene (total) | | 6 U | 37 | | 7 U | | 6 U | | 6 U | 28 |

Key

* All data presented in micrograms per kilogram (ug/kg).

(a) OU3 Data Validation Results.
(b) OU3 Limited Field Investigation Analytical Results.
(c) Ohio EPA split sample results.

B = Analyte detected in laboratory blank.
J = Estimated value.
U = Compound was analyzed for but not detected. The number is the method detection limit for the sample.

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Table II.4
Data Table For Semivolatile Organic Compounds, Bldg 51*
OU3 Limited Field Investigation

| SAMPLE ID | 0016-0001 | | 0017-0001 | | 0018-0001 | | 0019-0001 | |
|---|---|---|---|---|---|---|---|---|
| ANALYTE | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) |
| 3-Nitroaniline | 2000 UJ | 2000 U | 2200 UJ | 2200 U | 2100 UJ | 2100 U | 1900 UJ | 1900 U |
| Acenaphthene | 420 UJ | 420 U | 47 J | 47 J | 420 UJ | 420 U | 400 UJ | 400 U |
| 2,4-Dinitrophenol | 2000 UJ | 2000 U | 2200 UJ | 2200 U | 2100 UJ | 2100 U | 1900 UJ | 1900 U |
| 4-Nitrophenol | 2000 UJ | 2000 U | 2200 UJ | 2200 U | 2100 UJ | 2100 U | 1900 UJ | 1900 U |
| Dibenzofuran | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 2,4-Dinitrotoluene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Diethylphthalate | 420 UJ | 270 BJ | 450 UJ | 290 BJ | 420 UJ | 360 BJ | 400 UJ | 230 BJ |
| 4-Chlorophenyl-phenylether | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Fluorene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 4-Nitroaniline | 2000 UJ | 2000 U | 2200 UJ | 2200 U | 2100 UJ | 2100 U | 1900 UJ | 1900 U |
| 4,6-Dinitro-2-Methylphenol | 2000 UJ | 2000 U | 2200 UJ | 2200 U | 2100 UJ | 2100 U | 1900 UJ | 1900 U |
| N-Nitrosodiphenylamine | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 4-Bromophenyl-phenylether | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Hexachlorobenzene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Pentachlorophenol | 2000 UJ | 2000 U | 2200 UJ | 2200 U | 2100 UJ | 2100 U | 1900 UJ | 1900 U |
| Phenanthrene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Anthracene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Di-n-Butylphthalate | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Fluoranthene | 420 UJ | 420 U | 160 J | 160 J | 420 UJ | 420 U | 400 UJ | 400 U |
| Pyrene | 420 UJ | 420 U | 86 J | 86 J | 420 UJ | 420 U | 400 UJ | 400 U |
| Butylbenzylphthalate | 420 UJ | 420 U | 48 J | 48 J | 420 UJ | 420 U | 400 UJ | 400 U |
| 3,3'-Dichlorobenzidine | 840 UJ | 840 U | 900 UJ | 900 U | 850 UJ | 850 U | 800 UJ | 800 U |
| Benzo(a)Anthracene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Chrysene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| bis(2-Ethylhexyl)Phthalate | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |

Table II.4 (Continued)
Data Table For Semivolatile Organic Compounds, Bldg 51*
OU3 Limited Field Investigation

| SAMPLE ID | 0016-0001 | | 0017-0001 | | 0018-0001 | | 0019-0001 | |
|---|---|---|---|---|---|---|---|---|
| ANALYTE | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) |
| Di-n-Octyl Phthalate | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Benzo(b)Fluoranthene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Benzo(k)Fluoranthene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Benzo(a)Pyrene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Indeno(1,2,3-cd)Pyrene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Dibenz(a,h)Anthracene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Benzo(g,h,i)Perylene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Phenol | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| bis(2-Chloroethyl) Ether | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 2-Chlorophenol | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 1,3-Dichlorobenzene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 1,4-Dichlorobenzene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Benzyl Alcohol | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 1,2-Dichlorobenzene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 2-Methylphenol | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| bis(2-Chloroisopropyl)Ether | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 4-Methylphenol | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| N-Nitroso-Di-n-Propylamine | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Hexachloroethane | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Nitrobenzene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Isophorone | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 2-Nitrophenol | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 2,4-Dimethylphenol | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Benzoic Acid | 2000 UJ | 2000 U | 2200 UJ | 2200 U | 2100 UJ | 2100 U | 1900 UJ | 1900 U |
| bis(2-Chloroethoxy)Methane | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |

Table II.4 (Continued)
Data Table For Semivolatile Organic Compounds, Bldg 51*
OU3 Limited Field Investigation

| SAMPLE ID | 0016-0001 | | 0017-0001 | | 0018-0001 | | 0019-0001 | |
|---|---|---|---|---|---|---|---|---|
| ANALYTE | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) |
| 2,4-Dichlorophenol | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 1,2,4-Trichlorobenzene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Napthalene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 4-Chloroaniline | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Hexachlorobutadiene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 4-Chloro-3-Methylphenol | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 2-Methylnaphthalene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Hexachlorocyclopentadiene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 2,4,6-Trichlorophenol | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 2,4,5-Trichlorophenol | 2000 UJ | 2000 U | 2200 UJ | 2200 U | 2100 UJ | 2100 U | 1900 UJ | 1900 U |
| 2-Chloronaphthalene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 2-Nitroaniline | 2000 UJ | 2000 U | 2200 UJ | 2200 U | 2100 UJ | 2100 U | 1900 UJ | 1900 U |
| Dimethyl Phthalate | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| Acenaphthylene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |
| 2,6-Dinitrotoluene | 420 UJ | 420 U | 450 UJ | 450 U | 420 UJ | 420 U | 400 UJ | 400 U |

Key

* All data presented in micrograms per kilogram (ug/kg)

(a) OU3 Data Validation Results.
(b) OU3 Limited Field Investigation Analytical Results.

B = Analyte detected in laboratory blank.
J = Estimated value.
U = Compound was analyzed for but not detected. The number is the method detection limit for the sample.

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Table II.5
Data Table For Pesticides and PCBs, Bldg 51*
OU3 Limited Field Investigation

| SAMPLE ID | 0016-0001 | | | 0017-0001 | | 0018-0001 | | 0019-0001 | | | 0019-1001 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ANALYTE | Validated Data (a) | Form I Data (b) | OEPA Data (c) | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) | OEPA Data (c) | Validated Data (a) | Form I Data (b) |
| alpha-BHC | 2.5 UJ | 2.5 U | 8 U | 2.7 UJ | 2.7 U | 2.6 UJ | 2.6 U | 2.4 UJ | 2.4 U | 20 U | 2.6 UJ | 2.6 U |
| beta-BHC | 5.1 UJ | 5.1 U | 8 U | 5.5 UJ | 5.5 U | 5.1 UJ | 5.1 U | 4.9 UJ | 4.9 UY | 20 U | 5.1 UJ | 5.1 UY |
| delta-BHC | 14 J | 14 X | 8 U | 8.2 UJ | 8.2 U | 7.7 UJ | 7.7 U | 7.3 UJ | 7.3 UY | 20 U | 8.6 UJ | 8.6 UZ |
| gamma-BHC (Lindan | 3.4 UJ | 3.4 U | 8 U | 3.7 UJ | 3.7 U | 3.5 UJ | 3.5 U | 3.3 UJ | 3.3 U | 20 U | 3.4 UJ | 3.4 U |
| Heptachlor | 2.5 UJ | 2.5 U | 8 U | 2.7 UJ | 2.7 U | 2.6 UJ | 2.6 U | 2.4 UJ | 2.4 U | 20 U | 2.6 UJ | 2.6 U |
| Aldrin | 3.4 UJ | 3.4 U | 8 U | 3.7 UJ | 3.7 U | 3.5 UJ | 3.5 U | 3.3 UJ | 3.3 U | 20 U | 3.4 UJ | 3.4 U |
| Heptachlor epoxide | 70 UJ | 70 U | 8 U | 76 UJ | 76 U | 71 UJ | 71 U | 68 UJ | 68 U | 20 U | 71 UJ | 71 U |
| Endosulfan I | 12 UJ | 12 U | 8 U | 13 UJ | 13 U | 12 UJ | 12 U | 11 UJ | 11 U | 20 U | 12 UJ | 12 U |
| Dieldrin | 1.6 UJ | 1.6 U | 8 U | 1.8 UJ | 1.8 U | 1.7 UJ | 1.7 U | 1.6 UJ | 1.6 U | 33 U | 1.7 UJ | 1.7 U |
| 4,4'-DDE | 3.4 UJ | 3.4 U | 17 U | 3.7 UJ | 3.7 U | 3.5 UJ | 3.5 U | 3.3 UJ | 3.3 U | 33 U | 3.4 UJ | 3.4 U |
| Endrin | 5.1 UJ | 5.1 U | 17 U | 5.5 UJ | 5.5 U | 5.1 UJ | 5.1 U | 4.9 UJ | 4.9 U | 33 U | 5.1 UJ | 5.1 U |
| Endosulfan II | 3.4 UJ | 3.4 U | 17 U | 3.7 UJ | 3.7 U | 3.5 UJ | 3.5 U | 3.3 UJ | 3.3 U | 33 U | 3.4 UJ | 3.4 UY |
| 4,4'-DDD | 9.4 UJ | 9.4 U | 17 U | 10 UJ | 10 U | 9.5 UJ | 9.5 U | 9.0 UJ | 9.0 U | 33 U | 9.4 UJ | 9.4 U |
| Endosulfan sulfate | 56 UJ | 56 U | 17 U | 60 UJ | 60 U | 57 UJ | 57 U | 54 UJ | 54 U | 33 U | 56 UJ | 56 U |
| 4,4'-DDT | 10 UJ | 10 U | 17 U | 11 UJ | 11 U | 10 UJ | 10 U | 9.7 UJ | 9.7 U | 33 U | 10 UJ | 10 U |
| Methoxychlor | 150 UJ | 150 U | 83 U | 160 UJ | 160 U | 150 UJ | 150 U | 140 UJ | 140 U | 170 U | 150 UJ | 150 U |
| Endrin ketone | 20 UJ | 20 U | 17 U | 22 UJ | 22 U | 21 UJ | 21 U | 20 UJ | 20 U | 33 U | 20 UJ | 20 U |
| alpha-chlordane | 12 UJ | 12 U | 83 U | 13 UJ | 13 U | 12 UJ | 12 U | 11 UJ | 11 U | 170 U | 12 UJ | 12 U |
| gamma-chlordane | 12 UJ | 12 U | 83 U | 13 UJ | 13 U | 12 UJ | 12 U | 11 UJ | 11 U | 170 U | 12 UJ | 12 U |
| Toxaphene | 200 UJ | 200 U | 165 U | 220 UJ | 220 U | 210 UJ | 210 U | 200 UJ | 200 U | 330 U | 200 UJ | 200 U |
| Aroclor-1016 | 100 UJ | 100 U | 83 U | 110 UJ | 110 U | 100 UJ | 100 U | 97 UJ | 97 U | 170 U | 100 UJ | 100 U |
| Aroclor-1221 | 100 UJ | 100 U | 83 U | 110 UJ | 110 U | 100 UJ | 100 U | 97 UJ | 97 U | 170 U | 100 UJ | 100 U |
| Aroclor-1232 | 100 UJ | 100 U | 83 U | 110 UJ | 110 U | 100 UJ | 100 U | 97 UJ | 97 U | 170 U | 100 UJ | 100 U |
| Aroclor-1242 | 100 UJ | 100 U | 83 U | 110 UJ | 110 U | 100 UJ | 100 U | 97 UJ | 97 U | 170 U | 100 UJ | 100 U |
| Aroclor-1248 | 100 UJ | 100 U | 83 U | 110 UJ | 110 U | 100 UJ | 100 U | 97 UJ | 97 U | 170 U | 100 UJ | 100 U |
| Aroclor-1254 | 200 UJ | 200 U | 165 U | 220 UJ | 220 U | 200 UJ | 200 U | 190 UJ | 190 U | 330 U | 200 UJ | 200 U |
| Aroclor-1260 | 200 UJ | 200 U | 165 U | 220 UJ | 220 U | 200 UJ | 200 U | 190 UJ | 190 U | 330 U | 200 UJ | 200 U |
| Endrin aldehyde | 20 UJ | 20 U | | 21 UJ | 21 U | 20 UJ | 20 U | 19 UJ | 19 U | | 20 UJ | 20 U |

Key

* All data presented in micrograms per kilogram (ug/kg).

(a) OU3 Data Validation Results.
(b) OU3 Limited Field Investigation Analytical Results.
(c) Ohio EPA split sample results.

U = Compound was analyzed for but not detected. The number is the method detection limit for the sample.
X = Quantitation performed from secondary column.
Y = Detection limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.
Z = No analytical result reported for this compound.

r:\projects\dess\mound\mound.wq5

Table II.6
Data Table For Inorganics, Bldg. 51*
OU3 Limited Field Investigation

| SAMPLE ID | 0016-0001 | | | 0017-0001 | | 0018-0001 | | 0019-0001 | | | 0019-1001 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ANALYTE | Validated Data (a) | Form I Data (b) | OEPA Data (c) | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) | Validated Data (a) | Form I Data (b) | OEPA Data (c) | Validated Data (a) | Form I Data (b) |
| Aluminum | | 18100 | 930 | | 20000 | | 22300 | | 19200 | 1200 | | 18900 |
| Antimony | 6.1 U | 6.1 B | <10 | | 5.9 U | | 5.7 U | | 5.4 U | <10 | | 5.7 U |
| Arsenic | 10.5 J | 10.5 | 2.2 | | 13.3 | | 11.3 | | 7.5 | 2.3 | | 8.0 |
| Barium | | 72.0 | 45 | | 70.9 | | 89.7 | | 82.1 | 45 | | 86.2 |
| Beryllium | | 0.90 | 1 | | 0.94 | | 0.90 | | 0.87 | 1 | | 0.92 |
| Cadmium | 0.50 UJ | 0.50 U | <0.5 | 0.52 UJ | 0.52 U | 0.51 UJ | 0.51 U | 0.48 UJ | 0.48 U | <0.5 | 0.51 UJ | 0.51 U |
| Calcium | 53700 J | 53700 | 40000 | 15300 J | 15300 B | 11300 J | 11300 B | 26200 J | 26200 | 32000 | | 56400 |
| Chromium | | 18.5 | 12 | | 21.8 | | 23.7 | | 19.9 | 15 | | 20.5 |
| Cobalt | | 10.6 | 8 | | 12.8 | | 13.4 | | 12.8 | 10 | | 11.2 |
| Copper | 20.4 J | 20.4 | 14 | 26.0 J | 26.0 | 20.2 J | 20.2 | 28.0 J | 28.0 | 16 | 38.2 J | 38.2 |
| Iron | 25100 J | 25100 | 19000 | 34100 J | 34100 | 33200 J | 33200 | 30000 J | 30000 | 27000 | 26500 J | 26500 |
| Lead | | 23.9 | 10 | | 20.3 | | 20.3 | | 19.6 | 10 | | 21.9 |
| Magnesium | 16000 J | 16000 | 9800 | 8600 J | 8600 | 5560 J | 5560 | 8940 J | 8940 | 6600 | 18000 J | 18000 |
| Manganese | | 517 | 480 | | 683 | | 1030 | | 867 | 530 | | 483 |
| Mercury | | 0.06 U | <0.25 | | 0.06 U | | 0.06 U | | 0.28 | <0.25 | | 0.37 |
| Nickel | 22.1 J | 22.1 | 15 | 28.2 J | 28.2 | 22.0 J | 22.0 | 20.3 J | 20.3 | 19 | 23.0 J | 23.0 |
| Petroleum Hydrocarbons | | | <25 | | | | | | | <25 | | |
| Percent Solids (%) | | | 79 | | | | | | | 80 | | |
| Potassium | | 4200 | 1300 | | 4260 | | 4650 | | 4080 | 1400 | | 4670 |
| Selenium | 1.7 J | 1.7 | 0.3 | 1.9 J | 1.9 | 1.6 J | 1.6 | 1.4 J | 1.4 | 0.2 | 1.7 J | 1.7 |
| Silver | 0.62 U | 0.62 B | <2 | 0.94 U | 0.94 B | 0.38 UJ | 0.38 U | 0.86 U | 0.86 B | <2 | 0.83 U | 0.83 B |
| Sodium | | 309 B | 150 | | 161 B | | 237 B | | 232 B | 160 | | 262 B |
| Thallium | | 0.27 B | <0.25 | | 0.42 B | | 0.24 B | | 0.21 B | <0.25 | | 0.27 B |
| Vanadium | | 28.4 | 41 | | 33.5 | | 38.4 | | 27.9 | 32 | | 27.2 |
| Zinc | | 74.0 | 44 | | 91.6 | | 74.0 | | 94.0 | 50 | | 112 |
| Cyanide | | 0.63 U | | | 0.68 U | | 0.64 U | | 0.61 U | | | 0.63 U |

Key

- All data presented in milligrams per kilogram (mg/kg).

(a) OU3 Data Validation Results.
(b) OU3 Limited Field Investigation Analytical Results.
(c) Ohio EPA split sample results

B = Analyte detected in laboratory blank.
J = Estimated value.
U = Compound was analyzed for but not detected. The number is the method detection limit for the sample.

validation and quality assessment of the data will be presented in the OU3 LFI Report.

According to the preliminary OU3 data quality assessment presented in Appendix C, analytical data generated in the OU3 LFI are of sufficient quality for the purposes of this report, that is, the data will support a meaningful comparison with regulatory or health-based thresholds.

# 3. DISCUSSION

## 3.1. COMPARISON OF SAMPLING AND ANALYSIS EFFORTS AND RESULTS

Upon review of the analytical data provided in Section 2.2., it is evident that EP tank removal results and OU3 LFI results cannot be directly compared. Tank removal results reflect the OEPA data requirements for closure of a UST site. Alternately, the OU3 LFI data includes parameters of concern to the CERCLA RI/FS effort at Mound Plant. In order to conservatively evaluate the tank site soils, the two data sets are considered to be cumulative to form a single, larger analytical resource. There are, however, certain differences between the investigation results that must be discussed.

As described in Section 2.1., samples taken as part of EP tank removal activities were collected just after the tank had been removed from the ground. These sample results would accordingly reflect the condition of relatively undisturbed excavation soils. In addition, EP tank removal samples included soils from directly beneath the center of the tank above the concrete pad and from roughly the depth of the pad at two ends. Consequently, these samples were collected near the tank and conceivably represent soils most recently contaminated with the tank contents. At the time of the tank excavation, staining was also reported on the bottom of the excavation cavity, however, no groundwater or product was seen in the excavation. Low PID readings were recorded (10 to 15 ppm).

In contrast, OU3 LFI samples were taken after the tank excavation had remained open for nearly 9 months, which had the unplanned result of allowing contaminants to volatilize and biodegrade, and also potentially be flushed or diluted to some degree by precipitation. Furthermore, OU3 LFI samples were collected deeper than the EP tank removal samples, which should cause the OU3 LFI samples to reflect soils contaminated by materials released at an earlier point in time than those of the tank removal samples. Because contaminant concentrations reported in the OU3 LFI results are overall much lower than those reported from EP tank removal activities and because the OU3 LFI results were from deeper samples, and because of the physical evidence noted at the time of the tank removal, the extent of contamination may be very limited. OU3 LFI samples did not include soil from the top of the tank pad.

Although analytical parameters differed somewhat between the two investigations, both included testing for VOCs, cyanide, PCBs, and metals; some of the specific parameters also varied. In addition, the OU3 LFI included testing for SVOCs, which would roughly correspond with the TPH testing performed in the tank removal investigation, as both analyses may provide data reflecting the presence of potentially hazardous heavy hydrocarbon compounds.

EP tank removal results (Table II.2) report chloroform in a concentration of 21 $\mu$g/kg on top of the tank pad and at the end of the tank pad near Building 51. Trichloroethylene was also detected in these samples in concentrations ranging from 53 $\mu$g/kg at the Building 51 end of the pad to 210 $\mu$g/kg on top of the pad (Figure 2.2). Neither chloroform nor trichloroethylene was detected in the OU3 LFI analyses. The OU3 LFI analyses did, however, report finding acetone in concentrations up to 25 $\mu$g/kg, carbon disulfide in an estimated concentration of 4 $\mu$g/kg, and 2-butanone (methyl ethyl ketone) in concentrations of up to 70 $\mu$g/kg.

With the exception of phenol, which was not detected, and TPH, EP tank removal analyses did not include SVOCs. OU3 LFI results report several SVOCs in trace concentrations, estimated below the nominal detection limits and also several tentatively identified compounds (TIC). Appendix B presents the analyte results for the OU3 testing including SVOCs, which report the qualitative detection of some unknown hydrocarbons. Because the instrument run times were relatively long for these TICs, it appears that they represent various heavy hydrocarbon compounds. The numeric concentrations of these TICs are estimated and cannot be compared with the concentrations of TPH reported in the tank removal results; however, the TICs may indicate that TPH detected in tank site soils consists of hydrocarbon compounds not identified as a concern in the Mound Plant RI/FS efforts and not included in the VOC target analyte list.

As described in Section 2.2., various metals were detected in tank site soils in both investigations; however, because metals are common, naturally occurring soil constituents, the concentrations detected may only reflect background soil levels. At this time, background soil chemistry information is not yet available for Mound Plant and concentrations of metals detected at the tank site must be regarded as contaminants.

A notable exception is beryllium, which was detected in the OU3 LFI analysis and is not likely to be found in background soils. The beryllium found in the former tank site soils is probably the result of an ineffective air filtration system used in Mound Plant manufacturing activities, such as the use of cutting oils containing trace amounts of beryllium in machining area operations from roughly 1953 to 1965 (DOE, 1991d) and is not thought to be a tank-related contaminant.

## 3.2. REMOVAL ACTION EVALUATION

Since the concentration of contaminants in the soil at the Building 51 tank site are relatively low, there is need to question whether a removal action is necessary (see Section 1.1.1.). CERCLA requirements specified in 40 CFR 300.410(e) indicate that a removal site evaluation should be terminated when:

(1) There is no release;

(2) The source is neither a vessel nor a facility as defined in 40 CFR 300.5 of the NCP;

(3) The release involves neither a hazardous substance, nor a pollutant or contaminant that may present an imminent and substantial danger to public health or welfare;

(4) The release is of a naturally occurring material, contained within structure, or results only from ordinary use-deterioration of a water supply and there is no other authority to respond in a capable and timely manner;

(5) The amount, quantity, or concentration released does not warrant federal response;

(6) A party responsible for the release, or any other person, is providing appropriate response, and on-scene monitoring by the government is not required; or

(7) The removal site evaluation is completed.

The decision to terminate a removal evaluation is commonly completed on the basis of available information as a conceptual exercise. The information is evaluated to determine whether an "imminent and substantial danger to the public health and welfare" exists. At the Building 51 former tank site, contaminants at the site are currently buried 9 feet or more bgs. Therefore, there is no likelihood of significant exposure to human populations or animals through the following pathways:

- Direct ingestion of contaminated soil or dust.
- Inhalation of contaminants from fugitive dust emissions.
- Contaminant exposure resulting from surface water run-off to sources of drinking water or recreation (streams, lakes).
- Uptake and subsequent biomagnification of contaminants from soil by native vegetation.

The only pathway of possible significance is contamination of groundwater. Although the Building 51 former tank site was not investigated as a potential source of groundwater contamination in the OU3 LFI, this pathway is not expected to present an imminent hazard for the following reasons:

- Concentrations of contaminants in soils at the 7 to 10 foot bgs level are relatively low as described in Section 3.1.
- Based on physical evidence (see Section 3.1.), the total volume of released contaminants from the Building 51 tank is expected to be small.

- Total depth to groundwater is expected to be approximately 56 feet based on nearby monitoring wells (DOE, 1992b). Migration of contaminants through the unsaturated soil zone will result in a significant decrease in the concentration of contaminants.

- No drinking water wells are currently present in the vicinity of the Building 51 site.

Therefore, because there is no imminent and substantial danger to the public health or welfare, the criterion to terminate the removal site evaluation has been met and a removal action is not necessary.

## 3.3. DETERMINATION OF A NEED FOR FURTHER INVESTIGATION OR REMEDIATION

As stated in Section 1.1.2., the second objective of this report is to provide a preliminary determination of the need to conduct further investigation or remedial actions at the Building 51 former tank site. Because action levels based on ARARs or on risk studies have not yet been established at Mound Plant, possible action levels were established based on available regulatory and policy thresholds.

As discussed in Section 1., final interpretation and reporting of all OU3 data is pending. Proposal of ARARs in accordance with the FFA will be made in conjunction with the latter report. The following discussion is provided only to place the Building 51 results in context and support a decision about whether further action in the form of investigations or remediations is needed at this time.

With respect to ARAR determinations, the Mound Plant FFA, Section XII (F)(1), states that:

> For those primary documents or secondary documents that consist of or include ARAR determinations...the project managers shall meet to identify and propose...all potential ARARs pertinent to the report being addressed.

CERCLA § 121(d) requires that ARARs be complied with when performing remedial responses. "Applicable requirements," as defined in 40 CFR 300.5, mean:

> Those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable.

"Relevant and appropriate requirements," also defined in 40 CFR 300.5, mean:

> Those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility sating laws, that, while not 'applicable' to a hazardous substances, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are identified in a timely manner and that are more stringent than federal requirements may be relevant and appropriate.

According to CERCLA § 121(d)(2), in order to be considered an ARAR, a state requirement must have been "promulgated." As defined in 40 CFR 300.400(g)(4) of the NCP, the term "promulgated" means that the requirement is of general applicability and is legally enforceable.

In addition to ARARs, advisories, criteria, or guidance may be identified as "to be considered" (TBC) for a particular release. As defined in 40 CFR 300.400(g)(3), the TBC category consists of advisories, criteria, or guidance developed by EPA, other federal agencies, or states that may be useful in developing remedies. Use of TBCs is discretionary rather than mandatory, as opposed to ARARs, with which compliance is mandatory.

### 3.3.1. ARAR Categories

In general, there are three categories of ARARs. These categories are:

- Ambient or chemical-specific requirements set health- or risk-based concentration limits in various environmental media for specific hazardous substances or pollutants. At present, chemical-specific ARARs do not exist for contaminated soils and, accordingly, no regulatory numeric action levels can be established for evaluation of tank site investigation data.

- Location-specific requirements are limits placed on the concentration of hazardous substances or the conduct of activities solely because they occur in certain locations. Because this report presents an evaluation of an existing condition at Mound Plant, a detailed analysis of location-specific ARARs is not appropriate.

- Performance, design, or other action-specific requirements set controls or restrictions on particular kinds of activities related to management of hazardous substances or pollutants. Because this report presents an evaluation of an existing condition at Mound Plant, a detailed analysis of action-specific ARARs is not appropriate.

### 3.3.2. Possible Action Levels

As discussed in Section 3.3.1., chemical-specific ARARs for contaminated soils do not currently exist. In order to discuss action levels for this report, the EPA-proposed rule of 40 CFR Part 264 Subpart S, Corrective Action for Solid Waste Management Units (55 FR 30798) has been referenced. Specifically, the action level criteria for contaminated soil found in Appendix A (55 FR 30865) have been identified for contaminants apparently released from the Building 51 waste tank. Table III.1 presents a list of the contaminants together with possible action levels. Because many of the chemicals identified had not been assigned action levels in the proposed Subpart S rule, possible action levels were calculated by using chronic oral reference doses (RfD) and carcinogenic slope factors (CSF) taken from the EPA Health Effects Assessment Summary Tables, First Quarter, FY-1991 (EPA, 1991) and by using the risk formulas for carcinogens and systemic toxicants provided in Appendix E of the proposed rule (55 FR 30870) based on an ingestion route of exposure. The lowest concentration threshold for each potential contaminant, whether taken from the proposed rule tables or calculated, are presented in Table III.1. Ensuring that Building 51 waste tank contaminants exist in concentrations not greater than the levels presented in Table III.1 will provide for a carcinogenic risk of $10^{-6}$ or less for each carcinogen. Similarly, if contaminant concentrations are below Table III.1 thresholds, they are also below adverse effect levels for systemic toxicants.

If it becomes necessary to remove contaminated soils from the Building 51 tank site, ARARs governing the management and disposal of such soils would have to be proposed. These ARARs might include compliance with the Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions (LDR) in 40 CFR Part 268 for activities involving on-site placement of hazardous wastes or treatment prior to land disposal. If the contaminants in the soils can be identified as hazardous wastes, the soils would require testing to determine if waste constituents are present in excess of applicable treatment standards. These treatment standards are hazardous waste code-specific and indicate the maximum concentration of waste constituents allowable in wastes to be land disposed. An example of a hazardous waste code that might be applied to tank site soil contaminants is F039, multi-source location. In essence, F039 applies to leachate, or waste containing leachate, derived from a hazardous waste management unit that held hazardous wastes described by more than one waste code. F039 treatment standards for each of the constituents detected in Building 51 tank soils are provided in Table III.1. While no hazardous waste code determinations have been made for the soil constituents, the F039 standards are presented because they provide a good example of potential treatment standards.

Table III.1
Summary of Compounds Detected in Mound Plant Bldg. 51 Waste Storage
Tank Soils Compared with Selected Regulatory Thresholds

| PARAMETER | UNIT | 16-0001 | 17-0001 | 18-0001 | 19-0001 | 19-1001 | BMBEC | BMMOC | BMLEC | OEPA01 | OEPA01 | OEPA PETROLEUM SOIL CLEANU POLICY (ug/kg) | PROPOSED 264 SUBPART S (mg/kg) | F039 TREATMENT STANDARD IN LDRs (a) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | ug/kg | 6U | 7U | 6U | 6U | | <25 | <25 | <25 | 7 | 5 | | 7000 | 5.6 mg/kg |
| Acenaphthene | ug/kg | 420UJ | 47J | 420UJ | 400UJ | | | | | | | | 4800 | 4 mg/kg |
| Acetone | ug/kg | 69U | 240 | 250 | 200B | | <500 | <500 | <500 | 440 | 170 | | 8000 | 160 mg/kg |
| Aluminum | mg/kg | 18100 | 20000 | 22300 | 19200 | 18900 | | | | 930 | 1200 | | (b) | |
| Arsenic | mg/kg | 10.5J | 13.3 | 11.3 | 7.5 | 8.0 | 2.3 | 2.4 | 5.8 | 2.2 | 2.3 | | 80 | 5 mg/L |
| Barium | mg/kg | 72 | 70.9 | 89.7 | 82.1 | 86.2 | 16 | 8.5 | 38 | 45 | 45 | | 4000 | 52 mg/L |
| Beryllium | mg/kg | 0.90 | 0.94 | 0.90 | 0.87 | 0.92 | | | | 1 | 1 | | 0.2 | |
| Butylbenzylphthalate | ug/kg | 420UJ | 48J | 420UJ | 400UJ | | | | | | | | 20000 | 7.9 mg/kg |
| Cadmium | mg/kg | 0.5UJ | 0.52UJ | 0.51UJ | 0.48UJ | | 0.61 | 0.44 | 0.41 | <0.5 | <0.5 | | 40 | 0.06 mg/L |
| Calcium | mg/kg | 53700J | 15300J | 11300J | 26200J | 56400 | | | | 40000 | 32000 | | (b) | |
| Carbon disulfide | ug/kg | 6U | 4J | 6U | 6U | | | | | 5 | 5 | | 8000 | |
| Chlorobenzene | ug/kg | 6U | 7U | 6U | 6U | | | | | 14 | 12 | | 2000 | 5.7 mg/kg |
| Chloroform | ug/kg | 6U | 7U | 6U | 6U | | 21 | 21 | <10 | 5 | 5 | | 100 | 5.6 mg/kg |
| Chromium | mg/kg | 18.5 | 21.8 | 23.7 | 19.9 | 20.5 | 4.8 | 3.8 | 20 | 12 | 15 | | 400 | 5.2 mg/L |
| Cobalt | mg/kg | 10.6 | 12.8 | 13.4 | 12.8 | 11.2 | | | | 8 | 10 | | (b) | |
| Copper | mg/kg | 20.4J | 26.0J | 20.2J | 28.0J | 38.2J | | | | 14 | 16 | | 2960 | |
| Ethylbenzene | ug/kg | 6U | 7U | 6U | 6U | | <2 | <2 | <2 | 8 | 6 | 6000 | 8000 | 6 mg/kg |
| Fluoroanthene | ug/kg | 420UJ | 160J | 420UJ | 400UJ | | | | | | | | 3200 | 8.2 mg/kg |
| Iron | mg/kg | 25100J | 34100J | 33200J | 30000J | 26500J | 5000 | 4800 | 21000 | 19000 | 27000 | | (b) | |
| Lead | mg/kg | 23.9 | 20.3 | 20.3 | 19.6 | 21.9 | 6.1 | 2.3 | 6.4 | 10 | 10 | | (b) | 0.51 mg/L |
| Magnesium | mg/kg | 16000J | 8600J | 5560J | 8940J | 18000J | | | | 9800 | 6600 | | (b) | |
| Manganese | mg/kg | 517 | 683 | 1030 | 867 | 483 | 100 | 120 | 470 | 480 | 530 | | 8000 | |
| Mercury | mg/kg | 0.06U | 0.06U | 0.06U | 0.28 | .037 | 0.17 | 0.06 | 0.03 | <0.25 | <0.25 | | 20 | 0.025 mg/L |
| Methyl Ethyl Ketone (2-butanone) | ug/kg | 18 | 70 | 59 | 53 | | <1000 | <1000 | <1000 | 190 | 100 | | 4000 | 36 mg/kg |
| Methylene chloride | ug/kg | 6U | 7U | 6U | 6U | | <50 | <50 | <50 | 940 | 430 | | 90 | 33 mg/kg |

TABLE III.1 (Continued)
Summary of Compounds Detected in Mound Plant Bldg. 51 Waste Storage
Tank Soils Compared with Selected Regulatory Thresholds

| PARAMETER | UNIT | 16-0001 | 17-0001 | 18-0001 | 19-0001 | 19-1001 | BMBEC | BBMOC | BMLEC | OEPA01 | OEPA01 | OEPA PETROLEUM SOIL CLEANU POLICY (ug/kg) | PROPOSED 264 SUBPART S (mg/kg) | F039 TREATMENT STANDARD IN LDRs (a) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nickel | mg/kg | 22.1J | 28.2J | 22.0J | 20.3J | 23.0J | | | | 15 | 19 | | 2000 | 0.32 mg/L |
| PCBs | ug/kg | U(b) | U(b) | U(b) | U(b) | | 0.12PCB1254 | <0.04 | <0.04 | U(b) | U(b) | | 0.09 | |
| Potassium | mg/kg | 4200 | 4260 | 4650 | 4080 | 4670 | | | | 1300 | 1400 | | (c) | |
| Pyrene | ug/kg | 420UJ | 86J | 420UJ | 400UJ | | | | | | | | 24000 | 8.2 mg/kg |
| Selenium | mg/kg | 1.7J | 1.9J | 1.6J | 1.4J | 1.7J | <0.4 | <0.4 | <0.4 | 0.3 | 0.2 | | (c) | 5.7 mg/L |
| Sodium | mg/kg | 309B | 161B | 237B | 232B | 262B | 95 | 140 | <10 | 150 | 160 | | (c) | |
| Thallium | mg/kg | 0.27B | 0.42B | 0.24B | 0.21B | 0.27B | | | | <0.25 | <0.25 | | 5.6 | |
| Toluene | ug/kg | 6U | 7U | 6U | 6U | | <2 | <2 | <2 | 25 | 16 | 4000 | 20000 | 28 mg/kg |
| Total Petroleum Hydrocarbons | mg/kg | | | | | | 75 | 560 | 35 | <25 | <25 | 40000 | | |
| Total Solids | % | | | | | | 93 | 96 | 87 | 79 | 80 | | | |
| Trichloroethylene | ug/kg | 6U | 7U | 6U | 6U | | 53 | 210 | <25 | 5 | 5 | | 60 | 5.6 mg/kg |
| Vanadium | mg/kg | 28.4 | 33.5 | 38.4 | 27.9 | 27.2 | | | | 41 | 32 | | 560 | |
| Xylene | ug/kg | 6U | 7U | 6U | 6U | | <2 | <2 | <2 | 37 | 28 | 28000 | 200000 | 28 mg/kg |
| Zinc | mg/kg | 74.0 | 91.6 | 74.0 | 94.0 | 112 | | | | 44 | 50 | | 16000 | |
| delta-BHC | ug/kg | 14J | 8.2UJ | 7.7UJ | 7.3UJ | | | | | 8U | 20U | | 24 | 0.066 mg/kg |
| pH | S.U. | | | | | | 8.7 | 8.8 | 7.7 | | | | | |

Key

16-0001: IT Labs' split, sample #016
17-0001: IT Labs' split, sample #017
18-0001: IT Labs' split, sample #018
19-0001: IT Labs' split, sample #019

BMBEC: Bowser-Morner Sample, Building End of Cavity
BMMOC: Bowser-Morner Sample, Middle of Cavity
BMLEC: Bowser-Morner Sample, Lot End of Cavity
OEPA016: Ohio EPA's split, sample #016
OEPA019: Ohio EPA's split, sample #019

(a) When units are mg/L, treatment standard is concentration in extract.
(b) See laboratory results in Appendix B
(c) No oral Rfd or carcinogenic slope factor found.
Standard was not available, nor could it be calculated.

B = Analyte detected in laboratory blank
J = Estimated value
mg/kg = milligram per kilogram
mg/L = milligram per liter
mg/kg = microgram per kilogram
S.V. = Standard Units
U = Compound was analyzed for but not detected. The number is the method detection limit for the sample.

r:\projects\dess\mound\mound51.wq1

In the event that soil constituents would be found not to be hazardous wastes, petroleum hydrocarbon concentrations could be compared to those provided by the OEPA policy on petroleum-contaminated soils (OEPA, 1991). While not promulgated standards and therefore not ARARs, the OEPA thresholds do provide useful guidance and could be applied as TBCs; OEPA petroleum-contaminated soil standards are presented in Table III.1. It should be noted that the OEPA standards are reportedly being revised and a new TPH threshold of 105 mg/kg will be implemented (Gaston, 1992).

When investigation results are compared with the 40 CFR 264 Subpart S action levels in Table III.1, only beryllium is found to exceed the action level and the remaining analytes detected were often at least an order of magnitude lower than the action levels. The OU3 LFI detected beryllium in concentrations ranging from 0.87 to 0.94 mg/kg, which exceed the action level of 0.2. Applying the equation used to derive the action level, the maximum beryllium detected equates to a carcinogenic risk of $5.8 \times 10^{-6}$.

For comparison purposes only, when investigation results are evaluated against land disposal standards, no constituents are found to exceed the standards. However, some of the standards are expressed as milligrams per liter in waste extract. Consequently, constituents for which these standards might apply cannot be evaluated with available data.

Finally, when investigation results are compared to the OEPA petroleum-contaminated soil standards, only the TPH results from the EP tank removal activities exceed the OEPA standard. However, as discussed in Section 3.1, toxic TPH compounds were not detected in significant concentration in VOC and SVOC analyses.

Consequently, although comparison of soil contaminant data to possible action levels indicates beryllium and petroleum hydrocarbons are somewhat elevated, the low concentrations of these parameters present minimal risk to human health or the environment. Accordingly, further investigation or remediation should not be necessary. This determination will be re-evaluated in the future as the overall RI/FS effort progresses and formal remediation goals are established.

## 3.4. FUTURE COMPARISON WITH ARARs AND RISK-BASED PRGs

The discussion in Section 3.3. comparing investigation results to possible action levels is intended to offer criteria by which to evaluate existing data. Section 1.1. of this report explains the objectives of determining the need for a removal action for the released hazardous substances and of offering a preliminary determination of the need to conduct further investigation or remediation at the tank site.

Because investigation of the Building 51 tank site is a very small part of the overall ER Program investigation of the Mound Plant, an absolute decision whether to investigate or remediate the site at this time would be inappropriate. Efforts to establish preliminary remediation goals (PRG) are currently in progress and are scheduled to be completed in FY 1992. As the RI/FS process at Mound Plant proceeds, action levels will evolve from PRGs to become parts of the final remedial action objectives, which will include consideration of ARARs and site risk assessments. Location-specific contaminants at the Mound Plant will ultimately be evaluated from the perspective of large areas of the Plant and from the perspective of the Plant as a whole. As a result, the significance of the contaminant concentrations in the soils at the Building 51 tank site will require measurement with criteria based on a larger perspective before the tank site may be completely dismissed from concern. DOE has committed to retaining the tank site soil data in the OU3 Remedial Investigation where it will be addressed by the risk assessment/risk management process (DOE, 1992a).

## 3.5. POSSIBLE DATA GAPS

As noted in Section 1.1., the objective of the OU3 LFI is to focus primarily on source identification and characterization. The potential for groundwater contamination from Building 51 tank site soils was not investigated. Furthermore, the limited geologic information indicates the soils beneath the tank site may be moderately permeable. If, based on future re-evaluation of the data, the contaminants are identified as a potential threat to groundwater, additional sampling may be required. Such sampling could include testing the groundwater beneath the tank site and soil samples could be collected and tested to determine the leachability of the constituents of concern.

## 3.6. FUTURE ACTIONS

The DOE has prepared a "Proposal for Additional Work, Soil Gas Survey and Geophysical Investigations, Mound Plant Main Hill and SM/PP Hill Areas" (DOE, 1992a). During regulatory review of the proposal, OEPA requested an expansion of the sampling grid for soil gas sampling to include the intervening valley between the two hills, which includes the Building 51 former tank site.

Because the area of Building 51 would be included in the soil gas survey, DOE elected to tailor the sampling based on existing information about the Building 51 tank. Samples taken only in the area of the tank will be collected at depths of 15 and 25 feet bgs to be below the bottom elevation of the tank that was removed. Samples will be collected between the former tank location, the Mound Plant drainage ditch, and in a dowr.-valley location, with the presumption that any contaminant migration would be in the hydraulically downgradient location.

# 4. CONCLUSIONS

On the basis of the review and discussion presented in Sections 1., 2., and 3., the following conclusions are evident:

- The EP tank removal investigation identified chloroform in soil samples at a concentration of 21 μg/kg, as well as trichloroethylene at 210 μg/kg. The only VOCs detected during the OU3 LFI were 2-butanone at a concentration of 70 μg/kg and acetone at 250 μg/kg.

- The EP tank removal investigation did not identify SVOCs in soil samples. Low levels of SVOCs found during the OU3 LFI included: butylbenzyl phthalate at an estimated concentration of 48 μg/kg, acenaphthene at 47 μg/kg, fluoranthene at 160 μg/kg, pyrene at 86 μg/kg, and delta-BHC at 14 μg/kg.

- The EP tank removal investigation found low levels of arsenic, barium, cadmium, chromium, lead, manganese, and mercury in soil samples. The OU3 LFI also found low levels of the same metals as well as aluminum, beryllium, cobalt, copper, iron, magnesium, nickel, vanadium, and zinc. Most of these metals could be expected as background in soils, however, this expectation cannot be confirmed because background samples have not been collected off the site. The exception to this is beryllium, which was found at levels up to 0.92 mg/kg and would not be expected in background soils.

- The beryllium found in former tank site soils is probably the result of Mound Plant manufacturing activities that have involved the metal from 1953 to 1965 and is not considered to be a tank-related contaminant.

- On the basis of a review of the Building 51 former tank site soil contaminant data from Mound Plant EP tank removal activities and from the OU3 LFI of the site, a removal action to address the contaminated soils is not necessary.

- Upon review of the potential exposure pathways as provided in Section 3.2., there is no imminent and substantial danger to the public or welfare and, pursuant to 40 CFR 300.410(e). The DOE is hereby concluding the removal site evaluation.

- Based on comparison to these possible action levels, it is concluded that no need exists to conduct further investigation at the Building 51 tank site nor will there be a need to conduct remedial actions. This conclusion will have to be re-evaluated based on the results of background sampling and as the site-specific action levels for the Mound Plant evolve from PRGs, ARAR determination, the Baseline Risk Assessment, and the Record of Decision. DOE has committed to retaining the tank site soil data in the OU3 Remedial Investigation where it will be addressed by the risk assessment/risk management process (DOE, 1992a).

# 5. REFERENCES


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# APPENDIX A

## BOWSER-MORNER, INC. PRELIMINARY CLOSURE SITE ASSESSMENT

BOWSER MORNER
COMMITTED TO EXCELLENCE SINCE 1911

4518 Taylorsville Road
P.O. Box 51
Dayton, OH 45401-0051
513-236-8805
513-233-2018 FAX

June 24, 19912

Roy F. Weston Inc.
Denver Co.
Att: Kris Anderson

Dear Mr. Anderson

This letter is to clarify the apparent anomalies present within BOWSER-MORNER Inc. laboratory report No.: 9010428-001. The original report issued on November 26, 1990 is correct and without error. The report was amended on April 10, 1992 at the request of Steven Kitske R F Weston Inc. to add a data qualifier statement that clarifies the accuracy of the volatile organic target analytes which exceeded the instrument calibration range. It was on this amendment sent to Mr. Kitske on April 10, 1992 that was issued containing typographical errors. We regret that this error was undetected and sincerely apologize for any inconvenience incurred. A corrected copy accompanies this letter.

If you desire further information concerning this issue please feel free to contact me at 513 - 236-8805 ext. 228

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert, Manager

ECW/ecw

# BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Road- P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

TO: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 6/24/92
BMI No.: 9010428
Sample No.: 55588
Authorization : WO#10813

ON: One (1) Sample Received October 26, 1990 for Chemical Analysis.

**SAMPLE IDENTIFICATION:**

Sample From Tank No. 3

**TEST RESULTS:**

| Analyte | Results | Units | Method Limit |
|---|---|---|---|
| ——Volatile Organics—— | | | |
| Benzene | 39.6 | ug/L | 5 |
| Bromodichloromethane | BPQL | ug/L | 10 |
| Bromoform | BPQL | ug/L | 10 |
| Bromomethane | BPQL | ug/L | 5 |
| Carbon Tetrachloride | BPQL | ug/L | 10 |
| Chlorobenzene | BPQL | ug/L | 5 |
| Chloroethane | BPQL | ug/L | 10 |
| 2-Chloroethylvinyl Ether | BPQL | ug/L | 20 |
| Chloroform | 12.9 | ug/L | 10 |
| Chloromethane | BPQL | ug/L | 10 |
| cis-1,3-Dichloropropene | BPQL | ug/L | 5 |
| Dibromochloromethane | BPQL | ug/L | 5 |
| 1,1-Dichloroethane | BPQL | ug/L | 5 |
| 1,2-Dichloroethane | BPQL | ug/L | 5 |
| 1,2-Dichloropropane | BPQL | ug/L | 5 |
| Ethyl Benzene | 220 | ug/L | 5 |
| Methylene Chloride | 260 | ug/L | 5 |
| 1,1,2,2-Tetrachloroethane | BPQL | ug/L | 5 |
| Tetrachloroethylene | 7.6 | ug/L | 10 |
| Toluene | 1900 * | ug/L | 5 |
| trans-1,2-Dichloroethylene | 162 | ug/L | 5 |
| trans-1,3-Dichloropropene | BPQL | ug/L | 5 |
| 1,1,1-Trichloroethane | 10.4 | ug/L | 10 |
| 1,1,2-Trichloroethane | BPQL | ug/L | 5 |
| Trichloroethylene | 9100 * | ug/L | 5 |
| Trichlorofluoromethane | BPQL | ug/L | 5 |
| Vinyl Chloride | BPQL | ug/L | 10 |
| Xylene | 2400 * | ug/L | 10 |
| Acetone | 2,000,000 * | ug/L | 100 |
| Acrolein | BPQL | ug/L | 20 |
| Acrylonitrile | BPQL | ug/L | 200 |

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*10813 Reliable Construction*
*BMI No. 9010428-001*
*Page 2*

| Analyte | Results | Units | Method Limit |
|---|---|---|---|
| ------Volatile Organics------ | | | |
| Carbon Disulfide | BPQL | ug/L | 10 |
| Dibromomethane | BPQL | ug/L | 10 |
| Dichlorodifluoromethane | BPQL | ug/L | 10 |
| Methyl Butyl Ketone | BPQL | ug/L | 100 |
| Methyl Ethyl Ketone | 8400 * | ug/L | 200 |
| Methyl Isobutyl Ketone | 13,000 * | ug/L | 100 |
| Styrene | BPQL | ug/L | 10 |
| 1,2,3-Trichloropropane | BPQL | ug/L | 20 |
| Vinyl Acetate | BPQL | ug/L | 20 |
| ------Surrogate Standards------ | | | |
| 1,2-Dichloroethane-d4 | | | |
| Fluorbenzene | | | |
| Pentafluorobenzene | | | |
| Ave. Percent Recovery | 79 | % | |
| Mercury | <0.002 | mg/L | |
| Arsenic | <0.02 | mg/L | |
| Selenium | <0.05 | mg/L | |
| Silver | <0.1 | mg/L | |
| Barium | <0.1 | mg/L | |
| Cadmium | <0.01 | mg/L | |
| Chromium | <0.01 | mg/L | |
| Lead | <0.1 | mg/L | |
| Sodium | 510 | mg/L | |
| Iron | 8.7 | mg/L | |
| Manganese | 0.13 | mg/L | |
| Total Petroleum Hydrocarbons | 48 | mg/L | |
| Total Phenolics | <0.008 | mg/L | |
| Cyanide | <0.01 | mg/L | |
| Sulfide | 18 | mg/L | |
| Total Solids | 14330 | mg/L | |
| PCBs | 150 | ug/L | PCB 1260 |
| pH | 9.6 | | |
| Flash Point | No Flash to | 210' C | |

---Notes---
* Estimated values, due to Quantitation outside instrument calibration range.
BPQL = Below Practicle Quantitation Limits

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert, Manager
Environmental Sciences Laboratory

*ECWlecw*
*1-Client*

EG&G MOUND APPLIED TECHNOLOGIES
P.O. BOX 3000 MIAMISBURG, OHIO 45343-3000 • TEL (513)865-4020

July 1, 1991

Ms. Diana Mally
U. S. Environmental Protection Agency
5-HS-11
230 S. Dearborn St.
Chicago, IL 60604

Dear Ms. Mally:

Enclosed are copies of the Preliminary Closure Site Assessment Reports dated December 26, 1990 (Report #10813-1290-934) and April 9, 1990 (Report #10813-491-174). Ark Kleinrath of the USDOE, Dayton Area Office, requested that I forward the reports. The December 26, 1990 Report was submitted within 60 days of the start of tank closures but it did not address remediation. The April 9, 1991 Report addresses the remediation but does not include the site plan appendix or the laboratory report appendix.

If you have any questions, please call me at 513-865-4886 or FTS 774-4886.

Sincerely,

Katherine G. Koehler

Katherine G. Koehler
OU-3 Project Manager

KGK:db
Enclosures

cc: A. Kleinrath, DOE/DAO
M. Hatcher, OEPA
R. Neff, EG&G
D. Carfagno, EG&G
J. Price, Weston
~~D. Miller, Weston~~
D. Meyer DOE/AL

EG&G MOUND APPLIED TECHNOLOGIES
P.O. BOX 3000 MIAMISBURG, OHIO 45343-3000 • TEL (513)865-4020

July 1, 1991

Ms. Martha Hatcher
Ohio Environmental Protection Agency
40 S. Main St.
Dayton, OH 45402

Dear Ms. Hatcher:

Enclosed are copies of the Preliminary Closure Site Assessment Reports dated December 26, 1990 (Report #10813-1290-934) and April 9, 1990 (Report #10813-491-174). Ark Kleinrath of the USDOE, Dayton Area Office, requested that I forward the reports. The December 26, 1990 Report was submitted within 60 days of the start of tank closures but it did not address remediation. The April 9, 1991 Report addresses the remediation but does not include the site plan appendix or the laboratory report appendix.

If you have any questions, please call me at 513-865-4886 or FTS 774-4886.

Sincerely,

KGK/db

Katherine G. Koehler
OU-3 Project Manager

KGK:db
Enclosures

cc: A. Kleinrath, DOE/DAO
D. Mally, USEPA
R. Neff, EG&G
D. Carfagno, EG&G
J. Price, Weston
D. Meyer, DOE/AL

# Preliminary Closure Site Assessment, Three (3) Underground Storage Tanks, U.S. Department of Energy's Mound Plant, Miamisburg, Ohio

For

Reliable Construction Services
1639 Stanley Avenue
Dayton, Ohio 45404

Report No. 10813-491-174

April 9, 1991

BOWSER MORNER

BOWSER-MORNER

4518 Taylorsville Road • P.O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

# PRELIMINARY UNDERGROUND STORAGE TANK CLOSURE ASSESSMENT REPORT

REPORT TO: Reliable Construction Services
1639 Stanley Avenue
Dayton, Ohio 45404

REPORT DATE: April 9, 1991

REPORT NO.: 10813-491-174

Attention: Ms. Jeanette McDaniel
Mr. Dave Mitchell

REPORT ON: Preliminary Closure Site Assessment, Three (3) Underground Storage Tanks, U.S. Department of Energy's Mound Plant, Miamisburg, Ohio

## 1.0 SUMMARY

Three (3) underground storage tanks (UST's) were removed as part of permanent closures from the U.S. Department of Energy's Mound Plant in Miamisburg, Ohio on November 29, November 30, and December 4, 1990. The operator of the facility is EG&G Mound Applied Technologies. Before the tanks were removed, samples of the contents of the tanks were collected and analyzed to determine the proper method of disposal for the contents of each tank. The UST's were removed according to the State Fire Marshal's regulations. The surrounding soils were tested to comply with the requirements of both the State Fire Marshal, Bureau of Underground Storage Tank Regulations (BUSTR), and the Resource Conservation and Recovery Act (RCRA) governed by the Ohio Environmental Protection Agency. The initial observations and laboratory testing indicated that the soils in two of the former UST cavities will require additional remedial action. Mr. R.E. Burdge of EG&G Mound said they will remediate the tank site soil by bioremediation.

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## 2.0 PURPOSE OF REPORT

This report, prepared for Reliable Construction Services, describes the removal of three (3) underground storage tanks (UST's) at the above location and provides data and conclusions on the preliminary closure site assessments of these tanks.

## 3.0 LOCATIONS AND DESCRIPTIONS OF UST'S

UST #1 was to the east of the test fire facility on the south central part of the site. This 5000-gallon steel tank had been used to store aviation gasoline to fire burners in the shipping container test facility. Approximately 80 feet of supply line piping were associated with this tank.

UST #3 was directly behind Building #51. This tank had been used to store waste solvents and oils. The UST was a 1200-gallon steel tank with approximately 10 feet of associated piping.

UST #7 was next to Building #43 and had never been in service. Water found in the tank was reportedly from leak testing after the tank was installed. This 1000-gallon UST was constructed of stainless steel. All of the piping for this tank was above the ground.

The attached site plan shows the locations of these UST's.

## 4.0 WORK PERFORMED

On October 26, November 29, November 30, and December 4, 1990, a Bowser-Morner Associates, Inc. hydrogeologist, Mr. Jeffrey D. Floyd, was present during tank closure activities at the site. The specific tasks to be accomplished were:

- Obtain samples of the contents of the tanks for laboratory analysis
- Observe the excavation and removal of the tanks
- Obtain soil samples for laboratory analysis
- Provide a closure site assessment and final report

## 5.0 SAMPLING, ANALYSIS, AND CHARACTERIZATION OF UST CONTENTS

### 5.1 Sample Collection

On October 26, 1990, one sample of the contents of each UST was collected by lowering a pre-cleaned bailer into the tank through the fill pipe opening. Because UST #1 was nearly empty, no sample could be obtained. The samples collected were immediately placed on ice and transported to the laboratory for analyses. Strict chain-of-custody was maintained.

### 5.2 Laboratory Analyses

The samples were tested for the parameters specified by EG&G Mound Plant. The laboratory results are summarized below in Table 1. The laboratory reports are attached.

TABLE 1

LABORATORY RESULTS OF SAMPLES OF UST CONTENTS

| | Result | | |
|---|---|---|---|
| | BLDG 51 | BLDG 43 | |
| Parameter | UST #3 | UST #7 | Unit |
| Benzene | 39.6 | BPQL* | ug/L |
| Chloroform | 12.9 | BPQL | ug/L |
| Ethylbenzene | 220 | BPQL | ug/L |
| Methylene Chloride | 260 | BPQL | ug/L |
| Tetrachloroethylene | 7.6 | BPQL | ug/L |
| Toluene | 1,900 | BPQL | ug/L |
| Trans-1,2-Dichloroethylene | 162 | BPQL | ug/L |

(TABLE 1, LABORATORY RESULTS OF SAMPLES OF UST CONTENTS, Continued)

| | Result | | |
|---|---|---|---|
| Parameter | BLDG 51 UST #3 | BLDG 43 UST #7 | Unit |
| 1,1,1-trichloroethane | 10.4 | BPQL | ug/L |
| Trichloroethylene | 9,100 | BPQL | ug/L |
| Xylene | 2,400 | BPQL | ug/L |
| Acetone | 2,000 | BPQL | mg/L |
| Methyl Ethyl Ketone | 8,400 | BPQL | ug/L |
| Methyl Isobutyl Ketone | 13 | BPQL | mg/L |
| Mercury | < 0.001 | < 0.001 | mg/L |
| Arsenic | < 0.002 | < 0.002 | mg/L |
| Selenium | < 0.05 | 0.01 | mg/L |
| Silver | < 0.1 | < 0.1 | mg/L |
| Barium | < 0.1 | < 0.1 | mg/L |
| Cadmium | < 0.01 | < 0.01 | mg/L |
| Chromium | < 0.01 | < 0.01 | mg/L |
| Lead | < 0.1 | < 0.1 | mg/L |
| Sodium | 510 | 2.6 | mg/L |
| Iron | 8.7 | 0.26 | mg/L |
| Manganese | 0.13 | 0.02 | mg/L |
| Total Petroleum Hydrocarbons | 48 | < 1 | mg/L |
| Phenol | < 0.008 | 2.5 | mg/L |
| Cyanide | < 0.01 | < 0.01 | mg/L |

BOWSER MORNER

(TABLE 1, LABORATORY RESULTS OF SAMPLES OF UST CONTENTS, Continued)

| | Result | | |
|---|---|---|---|
| Parameter | BLDG 51 UST #3 | BLDG 43 UST #7 | Unit |
| Sulfide | 18 | 16 | mg/L |
| Total Solids | 14,330 | 19 | mg/L |
| PCB's | 150 PCB 1260 | < 0.8 | ug/L |
| pH | 9.6 | 7.0 | S.U** |
| Flash Point | None to 210 | None to 210 | Degrees F |

*Below Practical Quantification Limits

**Standard Units

5.3 Waste Characterization and Disposal

The contents of the tanks were identified and disposed of as follows:

UST #1 had reportedly only held aviation gasoline. Approximately 20 gallons of gasoline and sludge were pumped from the tank before the tank was removed. Reliable Construction Services put these waste materials in D.O.T.-approved drums and arranged for proper disposal.

UST #3 contained volatile organic compounds that are listed hazardous materials. The contents were characterized as hazardous waste, spent solvents. The contents were pumped into D.O.T. 17E approved drums for temporary storage at the site until EG&G Mound Applied Technologies could arrange for disposal.

UST #7, which was never put into service, apparently contained deionized water from the original leak testing. Mr. Richard Burdge, EG&G Project Manager, said that

phenols indicated from the laboratory tests of this substance were probably residuals from disinfecting cleansers used to clean the tank after it was installed. The common household cleaner, "Lysol," contains phenols. The tank contents were pumped out into the site's storm water management system.

## 6.0 UST REMOVAL

### 6.1 Permits

A permit to remove the UST's was obtained from the City of Miamisburg Fire Department.

### 6.2 Excavation and Removal of UST

Reliable Construction Services was contracted by EG&G to remove the UST's. On November 29, November 30, and December 4, 1990, the UST's were removed. A trackhoe and a backhoe were used for the excavations, which were left open pending laboratory reports.

### 6.3 Field Observations

#### 6.3.1 UST #1 BLDG 34, AVIATION GAS TANK

UST #1 was removed on November 29, 1990. The tank was pumped to remove as much liquid and sludge as possible. Approximately 20 gallons of liquid and sludge were removed and placed into D.O.T. 17E approved drums. The tank was purged until the vapor levels were less than 20% of the lower explosive limit as measured by an explosive gas meter. To ensure that explosive vapors did not regenerate, the UST was monitored several times during the removal operations.

A large trackhoe was used to excavate the UST. A concrete slab that lay over the tank and the fill materials around the tank were removed. Once the UST was exposed, it

was tilted so that any remaining liquid or sludge could be pumped out. The UST was then lifted from the excavation. The tank cavity was excavated in clay-type soils; the tank was backfilled with sand and with clay soils in the upper part of the cavity. A concrete slab was on the bottom of the cavity.

Although the part of the tank that had been in contact with the sand fill was in good condition, the part of the tank that had been surrounded by the clay-type soils was severely corroded. Several small holes were in the upper third of the tank where it had been in contact with the clay soils. After the condition of the tank was determined, it was loaded onto a truck for off-site disposal. Approximately 80 feet of piping that ran from the tank to the test facility were also removed during this process. No signs of leaks were seen in the piping. No groundwater or contents from the tank were noticed in the excavation.

6.3.2 UST #3 BLDG 51

UST #3 was removed on December 4, 1990. After the liquid and sludge inside this tank were pumped out, the UST was triple-rinsed. The liquid, sludge, and rinse were drummed for temporary storage until disposal could be arranged. The rinsing process also removed the vapors in the tank to safe levels as measured by an explosive gas meter.

A concrete slab that lay over the UST was removed and excavation proceeded. The cavity was excavated in clay-type soils and backfilled with sand. A concrete slab was on the bottom of the cavity. Some of the soils at the bottom of the cavity were stained and had a slight odor. No groundwater or contents from the tank were seen in the excavation.

After the UST was removed from the cavity, it was examined. The tank was in poor condition with heavy corrosion and numerous holes. The piping that ran from this tank to Building #51 was also in poor condition.

### 6.3.3 UST #7 BLDG 43

UST #7 was removed on November 30, 1990. The tank was tested with an explosive gas meter to determine if any explosive vapors were present. No explosive vapors were found and a photo-ionization detector indicated that no other organic vapors were present. The piping, all of which was above the ground, was removed back to Building #43. The associated equipment was also removed and the contents of the tank were pumped into the site's storm water management system. A backhoe was used to excavate and remove the tank. The tank cavity had been excavated in clay-type soils and the tank had been backfilled with sand and with some clay-type soils. A concrete slab lay at the bottom of the cavity. No contents from the tank or groundwater were noticed in the excavation.

The UST was in excellent condition with only a small area of minor corrosion on the upper part of the tank where it had been in contact with clay soils. The tank was loaded onto a truck for disposal off-site.

### 6.4 Groundwater Observations

No groundwater was observed in the cavities.

### 6.5 Free Product

No free product was seen in any of the cavities.

## 7.0 SAMPLE COLLECTION AND ANALYSIS

### 7.1 Sample Collection

Samples were taken according to the State Fire Marshal's and the Ohio Environmental Protection Agency's guidelines.

7.2 Details of Sample Collection

All of the samples were collected by hand. Three soil samples were collected from each tank cavity for laboratory analyses. One sample was collected from the middle of each cavity on top of the concrete slab. Two samples, one from each end of the cavity, were collected 6 to 12 inches below the top of the slab in each cavity.

The samples to be tested for volatile organics were placed in glass containers with septum lids; the samples for the rest of the analyses were placed in glass containers with Teflon-lined lids. All of the samples were placed on ice for transport. The site plan, showing sample locations, is attached.

7.3 Sample Screening

The soil samples and excavated materials were screened with a photo-ionization detector (PID) to measure the levels of organic vapors. The calibration curve for the PID is attached.

The PID showed no readings for the UST #1 cavity. PID readings were taken at 20-foot intervals along the piping to the test fire units. (Please see the attached drawing for exact sample collection locations and PID readings for these samples.)
Although the PID readings were minimal along the piping, readings up to 160 parts per million (ppm) were noted near the valves for the test fire units.

The PID readings of some of the excavated soils from the UST #3 cavity ranged from 10 to 15 ppm. The readings for the three soil samples from the bottom of the cavity were all 4 ppm.

No readings were found for any of the excavated materials or samples associated with UST #7.

7.4 Chain-of-Custody

Strict chain-of-custody was achieved by obtaining proper signatures as the samples were taken to the laboratory for analysis. Chain-of-custody documentation is attached.

7.5 Name and Affiliation of Person Collecting Samples

Mr. Jeffrey Floyd, a Bowser-Morner Associates, Inc. hydrogeologist, collected all of the samples.

7.6 Name and Affiliation of Third-Party Observer

Mr. Steve Meadows, Fire Inspector for the Miamisburg Fire Department, observed all of the UST removals.

7.7 Name, Address, and Telephone Number of Laboratory

Bowser-Morner, Inc., 4518 Taylorsville Road, Dayton, Ohio 45401
Telephone: (513) 236-8805

7.8 Laboratory Analyses and Results

Soil samples from the UST #1 (Building 34) cavity show elevated levels of iron. The total petroleum hydrocarbon levels are also elevated. No other parameters are higher than the expected background levels for the clay-type soils tested.

The analyses of the soil samples from the UST #3 (Building 51) cavity show low levels of organic solvents. All of the other parameters are within background levels for the clay-type soils tested.

Soil samples from the UST #7 cavity show very low levels of organic solvents. All of the other parameters are within background levels for the clay-type soil tested. The results of the laboratory tests of the samples collected when the UST's were removed are summarized in Tables 2-4. The laboratory reports are attached.

TABLE 2

LABORATORY RESULTS OF SAMPLES COLLECTED

DURING INITIAL EXCAVATION

UST #1 (BLDG 34)

Result

| Parameter | East Bottom Cavity | Middle Bottom Cavity | West Bottom Cavity | Unit |
|---|---|---|---|---|
| Benzene | < 2 | < 2 | < 2 | ug/kg |
| Chloroform | < 10 | < 10 | < 10 | ug/kg |
| Ethylbenzene | < 2 | < 2 | < 2 | ug/kg |
| Methylene Chloride | < 50 | < 50 | < 50 | ug/kg |
| Tetrachloroethylene | < 25 | < 25 | < 25 | ug/kg |
| Toluene | < 2 | < 2 | 2 | ug/kg |
| Trans-1,2-Dichloroethylene | < 25 | < 25 | < 25 | ug/kg |
| 1,1,1-trichloroethane | < 25 | < 25 | < 25 | ug/kg |
| Trichloroethylene | < 25 | < 25 | < 25 | ug/kg |
| Xylene | < 2 | < 2 | < 2 | ug/kg |
| Acetone | < 500 | < 500 | < 500 | ug/kg |
| Methyl Ethyl Ketone | < 1000 | < 1000 | < 1000 | ug/kg |
| Methyl Isobutyl Ketone | < 500 | < 500 | < 500 | ug/kg |
| Mercury | < 0.02 | < 0.02 | < 0.02 | mg/kg |
| Arsenic | 4.3 | 5.2 | 5.8 | mg/kg |
| Selenium | < 0.4 | < 0.4 | < 0.4 | mg/kg |

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(TABLE 2, LABORATORY RESULTS OF SAMPLES COLLECTED DURING INITIAL EXCAVATION, UST #1, Continued)

| Parameter | Result: East Bottom Cavity | Result: Middle Bottom Cavity | Result: West Bottom Cavity | Unit |
|---|---|---|---|---|
| Silver | 3.1 | 1.7 | 0.33 | mg/kg |
| Barium | 44 | 23 | 37 | mg/kg |
| Cadmium | 0.23 | 0.26 | 0.26 | mg/kg |
| Chromium | 11 | 10 | 13 | mg/kg |
| Lead | 3.0 | 3.0 | 3.2 | mg/kg |
| Sodium | 150 | 200 | 250 | mg/kg |
| Iron | 11,000 | 9,900 | 11,000 | mg/kg |
| Manganese | 210 | 190 | 170 | mg/kg |
| Total Petroleum Hydrocarbons | 50 | 175 | 60 | mg/kg |
| Phenol | < 0.15 | < 0.15 | < 0.15 | mg/kg |
| Cyanide | < 0.1 | < 0.1 | < 0.1 | mg/kg |
| Sulfide | < 1 | < 1 | < 1 | mg/kg |
| Total Solids | 94 | 95 | 95 | % |
| PCB's | < 0.04 | < 0.04 | < 0.04 | ug/kg |
| pH | 8.2 | 8.3 | 8.2 | S.U** |
| Flash Point | None to 210 | None to 210 | None to 210 | Degrees F |

*Below Practical Quantification Limits

**Standard Units

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TABLE 3

LABORATORY RESULTS OF SAMPLES COLLECTED

DURING INITIAL EXCAVATION

UST #3 (BLDG 51)

Result

| Parameter | Building End of Cavity | Middle of Cavity | Lot End of Cavity | Unit |
|---|---|---|---|---|
| Benzene | < 2 | < 2 | < 2 | ug/kg |
| Chloroform | 21 | 21 | < 10 | ug/kg |
| Ethylbenzene | < 2 | < 2 | < 2 | ug/kg |
| Methylene Chloride | < 50 | < 50 | < 50 | ug/kg |
| Tetrachloroethylene | < 25 | < 25 | < 25 | ug/kg |
| Toluene | < 2 | < 2 | < 2 | ug/kg |
| Trans-1,2-Dichloroethylene | < 25 | < 25 | < 25 | ug/kg |
| 1,1,1-trichloroethane | < 25 | < 25 | < 25 | ug/kg |
| Trichloroethylene | 53 | 210 | < 25 | ug/kg |
| Xylene | < 2 | < 2 | < 2 | ug/kg |
| Acetone | < 500 | < 500 | < 500 | ug/kg |
| Methyl Ethyl Ketone | < 1000 | < 1000 | < 1000 | ug/kg |
| Methyl Isobutyl Ketone | < 500 | < 500 | < 500 | ug/kg |
| Mercury | 0.17 | 0.06 | 0.03 | mg/kg |
| Arsenic | 2.3 | 2.4 | 5.8 | mg/kg |
| Selenium | < 0.4 | < 0.4 | < 0.4 | mg/kg |
| Silver | < 2 | < 2 | < 2 | mg/kg |

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(TABLE 3, LABORATORY RESULTS OF SAMPLES COLLECTED DURING INITIAL EXCAVATION, UST #3, Continued)

| Parameter | Result: Building End of Cavity | Middle of Cavity | Lot End of Cavity | Unit |
|---|---|---|---|---|
| Barium | 16 | 8.5 | 38 | mg/kg |
| Cadmium | 0.61 | 0.44 | 0.41 | mg/kg |
| Chromium | 4.8 | 3.8 | 20 | mg/kg |
| Lead | 6.1 | 2.3 | 6.4 | mg/kg |
| Sodium | 95 | 140 | < 10 | mg/kg |
| Iron | 5,000 | 4,800 | 21,000 | mg/kg |
| Manganese | 100 | 120 | 470 | mg/kg |
| Total Petroleum Hydrocarbons | 75 | 560 | 35 | mg/kg |
| Phenol | < 0.15 | < 0.15 | < 0.15 | mg/kg |
| Cyanide | < 0.1 | < 0.1 | < 0.1 | mg/kg |
| Sulfide | < 1 | < 1 | < 1 | mg/kg |
| Total Solids | 93 | 96 | 87 | % |
| PCB's | 0.12 PCB 1254 | < 0.04 | < 0.04 | ug/kg |
| pH | 8.7 | 8.8 | 7.7 | S.U** |
| Flash Point | None to 210 | None to 210 | None to 210 | Degrees F |

*Below Practical Quantification Limits

**Standard Units

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TABLE 4

LABORATORY RESULTS OF SAMPLES COLLECTED

DURING INITIAL EXCAVATION

UST #7

Result

| Parameter | North End of Cavity | Middle of Cavity | South End of Cavity | Unit |
|---|---|---|---|---|
| Benzene | < 2 | < 2 | < 2 | ug/kg |
| Chloroform | < 10 | 18 | 18 | ug/kg |
| Ethylbenzene | < 2 | < 2 | < 2 | ug/kg |
| Methylene Chloride | < 50 | < 50 | < 50 | ug/kg |
| Tetrachloroethylene | < 25 | < 25 | < 25 | ug/kg |
| Toluene | < 2 | 3 | < 2 | ug/kg |
| Trans-1,2-Dichloroethylene | < 25 | < 25 | < 25 | ug/kg |
| 1,1,1-trichloroethane | < 25 | < 25 | 31 | ug/kg |
| Trichloroethylene | < 25 | < 25 | < 25 | ug/kg |
| Xylene | < 2 | 3 | < 2 | ug/kg |
| Acetone | < 500 | < 500 | < 500 | ug/kg |
| Methyl Ethyl Ketone | < 1000 | < 1000 | < 1000 | ug/kg |
| Methyl Isobutyl Ketone | < 500 | < 500 | < 500 | ug/kg |
| Mercury | < 0.02 | < 0.02 | 0.03 | mg/kg |
| Arsenic | 1.2 | 1.6 | < 0.4 | mg/kg |
| Selenium | < 0.4 | < 0.4 | < 0.4 | mg/kg |
| Silver | < 2 | < 2 | < 2 | mg/kg |

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(TABLE 4, LABORATORY RESULTS OF SAMPLES COLLECTED DURING INITIAL EXCAVATION, UST #7, Continued)

| Parameter | Result: North End of Cavity | Result: Middle of Cavity | Result: South End of Cavity | Unit |
|---|---|---|---|---|
| Barium | 4 | 5 | 12 | mg/kg |
| Cadmium | < 0.2 | < 0.2 | < 0.2 | mg/kg |
| Chromium | 1.8 | 2.4 | 5.1 | mg/kg |
| Lead | < 2 | < 2 | < 2 | mg/kg |
| Sodium | 53 | 64 | 87 | mg/kg |
| Iron | 2,000 | 2,600 | 4,400 | mg/kg |
| Manganese | 53 | 71 | 160 | mg/kg |
| Total Petroleum Hydrocarbons | 25 | 17 | 30 | mg/kg |
| Phenol | < 0.15 | < 0.15 | < 0.15 | mg/kg |
| Cyanide | < 0.1 | < 0.1 | < 0.1 | mg/kg |
| Sulfide | < 1 | < 1 | < 1 | mg/kg |
| Total Solids | 81 | 97 | 85 | % |
| PCB's | 0.15 PCB 1260 | < 0.04 | < 0.04 | ug/kg |
| pH | 8.0 | 7.8 | 7.5 | S.U** |
| Flash Point | None to 210 | None to 210 | None to 210 | Degrees F |

*Below Practical Quantification Limits

**Standard Units

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## 8.0 CONCLUSIONS

Based on the findings of this preliminary closure assessment, additional remedial actions will be required at the former locations of Building 34 UST #1 and Building 51 UST #3. Elevated levels of petroleum hydrocarbons (TPH) are the primary concern that needs to be addressed.

The higher-than-normal level of TPH found in the UST #1 Building 34 cavity indicates that a small release of product has occurred. This TPH level exceeds the Ohio State Fire Marshal's allowable level for clean closure (<40mg/kg). The elevated level of iron in the samples collected from the UST #1 Building 34 cavity are probably due to rust from the tank. The excavated soils from this cavity will need to be remediated as waste materials. Mr. R.E. Burdge of EG&G Mound said they will remediate the tank site soil by bioremediation. This soil, and probably soils from further remedial actions, will be permitted to be disposed of in a sanitary landfill.

The low levels of organic solvents found in the soil samples from the Building 51 UST #3 cavity will not show toxicity in Toxic Characteristic Leaching Procedure (TCLP) testing and these soils are not likely to be classified as hazardous waste. The State Fire Marshal will require additional remedial action to reduce the elevated levels of total petroleum hydrocarbons found at this location (<40mg/kg). All of the other parameters are within background levels for the clay-type soils tested. The excavated soils from this cavity will need to be remediated as waste materials. Mr. R.E. Burdge of EG&G Mound said they will remediate the tank site soil by bioremediation. The soils should be tested using the TCLP method to determine the proper method of disposal although they will probably be allowed to be disposed of in a sanitary landfill.

At the levels of organic solvents found in the soil samples from the Building 43 UST #7 cavity, no further remedial action is be required. The other parameters tested for were all within background levels.

Thank you for selecting Bowser-Morner Associates, Inc. for this project. Your business is appreciated, and we look forward to working with you again soon. In the meantime, if you have any questions or if we can help you in any way, please let us know.

Sincerely,

Bowser-Morner Associates, Inc.

Jeffrey D. Floyd
Hydrogeologist
Project Manager

JDF/mlf
4-Client
2-File

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# LABORATORY REPORTS

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# Preliminary Closure Site Assessment, Three (3) Underground Storage Tanks, U.S. Department of Energy's Mound Laboratories, Miamisburg, Ohio

For

Reliable Construction Services
1639 Stanley Avenue
Dayton, Ohio 45404

Report No. 10813-1290-934

December 26, 1990

BOWSER-MORNER

4518 Taylorsville Road • P.O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

# PRELIMINARY UNDERGROUND STORAGE TANK CLOSURE ASSESSMENT REPORT

REPORT TO: Reliable Construction Services
1639 Stanley Avenue
Dayton, Ohio 45404

REPORT DATE: December 26, 1990

REPORT NO.: 10813-1290-934

Attention: Ms. Jeanette McDaniel
Mr. Dave Mitchell

REPORT ON: Preliminary Closure Site Assessment, Three (3) Underground Storage Tanks, U.S. Department of Energy's Mound Laboratories, Miamisburg, Ohio

## 1.0 SUMMARY

Three (3) underground storage tanks (UST's) were removed as part of permanent closures from the U.S. Department of Energy's Mound Laboratories in Miamisburg, Ohio on November 29, November 30, and December 4, 1990. The operator of the facility is EG&G Mound Applied Technologies. Before the tanks were removed, samples of the contents of the tanks were collected and analyzed to determine the proper method of disposal for the contents of each tank. The UST's were removed according to the State Fire Marshal's regulations. The surrounding soils were tested to comply with the requirements of both the State Fire Marshal, Bureau of Underground Storage Tank Regulations (BUSTR), and the Resource Recovery and Conservation Act (RCRA) governed by the Ohio Environmental Protection Agency. The initial observations and laboratory testing indicated that the soils in two of the former UST cavities will require additional remedial action.

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## 2.0 PURPOSE OF REPORT

This report, prepared for Reliable Construction Services, describes the removal of three (3) underground storage tanks (UST's) at the above location and provides data and conclusions on the preliminary closure site assessments of these tanks.

## 3.0 LOCATIONS AND DESCRIPTIONS OF UST'S

UST #1 was to the east of the test fire facility on the south central part of the site. This 5000-gallon steel tank had been used to store aviation gasoline to fire burners in the test fire facility. Approximately 80 feet of supply line piping were associated with this tank.

UST #3 was directly behind Building #51. This tank had been used to store waste solvents and oils. The UST was a 1200-gallon steel tank with approximately 10 feet of associated piping.

UST #7 was next to Building #43 and had never been in service. Water found in the tank was reportedly from leak testing after the tank was installed. This 1000-gallon UST was constructed of stainless steel. All of the piping for this tank was above the ground.

The attached site plan shows the locations of these UST's.

## 4.0 WORK PERFORMED

On October 26, November 29, November 30, and December 4, 1990, a Bowser-Morner Associates, Inc. hydrogeologist, Mr. Jeffrey D. Floyd, was present during tank closure activities at the site. The specific tasks to be accomplished were:

- Obtain samples of the contents of the tanks for laboratory analysis
- Observe the excavation and removal of the tanks
- Obtain soil samples for laboratory analysis
- Provide a closure site assessment and final report

## 5.0 SAMPLING, ANALYSIS, AND CHARACTERIZATION OF UST CONTENTS

### 5.1 Sample Collection

On October 26, 1990, one sample of the contents of each UST was collected by lowering a pre-cleaned bailer into the tank through the fill pipe opening. Because UST #1 was nearly empty, no sample could be obtained. The samples collected were immediately placed on ice and transported to the laboratory for analyses. Strict chain-of-custody was maintained.

### 5.2 Laboratory Analyses

The samples were tested for the parameters specified by Mound Laboratories. The laboratory results are summarized below in Table 1. The laboratory reports are attached.

TABLE 1

LABORATORY RESULTS OF SAMPLES OF UST CONTENTS

| | Result | | |
|---|---|---|---|
| Parameter | UST #3 | UST #7 | Unit |
| Benzene | 39.6 | BPQL* | ug/L |
| Chloroform | 12.9 | BPQL | ug/L |
| Ethylbenzene | 220 | BPQL | ug/L |
| Methylene Chloride | 260 | BPQL | ug/L |
| Tetrachloroethylene | 7.6 | BPQL | ug/L |
| Toluene | 1,900 | BPQL | ug/L |
| Trans-1,2-Dichloroethylene | 162 | BPQL | ug/L |

(TABLE 1, LABORATORY RESULTS OF SAMPLES OF UST CONTENTS, Continued)

| | Result | | |
|---|---|---|---|
| Parameter | UST #3 | UST #7 | Unit |
| 1,1,1-trichloroethane | 10.4 | BPQL | ug/L |
| Trichloroethylene | 9,100 | BPQL | ug/L |
| Xylene | 2,400 | BPQL | ug/L |
| Acetone | 2,000 | BPQL | mg/L |
| Methyl Ethyl Ketone | 8,400 | BPQL | ug/L |
| Methyl Isobutyl Ketone | 13 | BPQL | mg/L |
| Mercury | < 0.001 | < 0.001 | mg/L |
| Arsenic | < 0.002 | < 0.002 | mg/L |
| Selenium | < 0.05 | 0.01 | mg/L |
| Silver | < 0.1 | < 0.1 | mg/L |
| Barium | < 0.1 | < 0.1 | mg/L |
| Cadmium | < 0.01 | < 0.01 | mg/L |
| Chromium | < 0.01 | < 0.01 | mg/L |
| Lead | < 0.1 | < 0.1 | mg/L |
| Sodium | 510 | 2.6 | mg/L |
| Iron | 8.7 | 0.26 | mg/L |
| Manganese | 0.13 | 0.02 | mg/L |
| Total Petroleum Hydrocarbons | 48 | < 1 | mg/L |
| Phenol | < 0.008 | 2.5 | mg/L |
| Cyanide | < 0.01 | < 0.01 | mg/L |

(TABLE 1, LABORATORY RESULTS OF SAMPLES OF UST CONTENTS, Continued)

| | Result | | |
|---|---|---|---|
| Parameter | UST #3 | UST #7 | Unit |
| Sulfide | 18 | 16 | mg/L |
| Total Solids | 14,330 | 19 | mg/L |
| PCB's | 150 PCB 1260 | < 0.8 | ug/L |
| pH | 9.6 | 7.0 | S.U** |
| Flash Point | None to 210 | None to 210 | Degrees F |

*Below Practical Quantification Limits

**Standard Units

5.3 Waste Characterization and Disposal

The contents of the tanks were identified and disposed of as follows:

UST #1 had reportedly only held aviation gasoline. Approximately 20 gallons of gasoline and sludge were pumped from the tank before the tank was removed. Reliable Construction Services put these waste materials in D.O.T.-approved drums and arranged for proper disposal.

UST #3 contained volatile organic compounds that are listed hazardous materials. The contents were characterized as hazardous waste, spent solvents. The contents were pumped into D.O.T.-approved drums for temporary storage at the site until EG&G Mound Applied Technologies could arrange for disposal.

UST #7, which was never put into service, apparently contained deionized water from the original leak testing. Mr. Richard Burdg, EG&G Project Manager, said that

phenols indicated from the laboratory tests of this substance were residuals from disinfecting cleansers used to clean the tank after it was installed. The common household cleaner, "Lysol," contains phenols. The tank contents were pumped out into the site's storm water management system.

## 6.0 UST REMOVAL

### 6.1 Permits

A permit to remove the UST's was obtained from the City of Miamisburg Fire Department.

### 6.2 Excavation and Removal of UST

Reliable Construction Services was hired to remove the UST's. On November 29, November 30, and December 4, 1990, the UST's were removed. A trackhoe and a backhoe were used for the excavations, which were left open pending laboratory reports.

### 6.3 Field Observations

#### 6.3.1 UST #1

UST #1 was removed on November 29, 1990. The tank was pumped to remove as much liquid and sludge as possible. Approximately 20 gallons of liquid and sludge were removed and placed into D.O.T.-approved drums. The tank was purged until the vapor levels were less than 20% of the lower explosive limit as measured by an explosive gas meter. To ensure that explosive vapors did not regenerate, the UST was monitored several times during the removal operations.

A large trackhoe was used to excavate the UST. A concrete slab that lay over the tank and the fill materials around the tank were removed. Once the UST was exposed, it was tilted so that any remaining liquid or sludge could be pumped out. The UST was then

lifted from the excavation. The tank cavity was excavated in clay-type soils; the tank was backfilled with sand and with clay soils in the upper part of the cavity. A concrete slab was on the bottom of the cavity.

Although the part of the tank that had been in contact with the sand fill was in good condition, the part of the tank that had been surrounded by the clay-type soils was severely corroded. Several small holes were in the upper third of the tank where it had been in contact with the clay soils. After the condition of the tank was determined, it was loaded onto a truck for off-site disposal. Approximately 80 feet of piping that ran from the tank to the test fire facility were also removed during this process. No signs of leaks were seen in the piping. No groundwater or contents from the tank were noticed in the excavation.

6.3.2 UST #3

UST #3 was removed on December 4, 1990. After the liquid and sludge inside this tank were pumped out, the UST was triple-rinsed with water. The liquid, sludge, and rinse water were drummed for temporary storage until disposal could be arranged. The rinsing process also removed the vapors in the tank to safe levels as measured by an explosive gas meter.

A concrete slab that lay over the UST was removed and excavation proceeded. The cavity was excavated in clay-type soils and backfilled with sand. A concrete slab was on the bottom of the cavity. Some of the soils at the bottom of the cavity were stained and had a slight odor. No groundwater or contents from the tank were seen in the excavation.

After the UST was removed from the cavity, it was examined. The tank was in poor condition with heavy corrosion and numerous holes. The piping that ran from this tank to Building #51 was also in poor condition.

6.3.3 UST #7

UST #7 was removed on November 30, 1990. The tank was tested with an explosive gas meter to determine if any explosive vapors were present. No explosive vapors were found and a photo-ionization detector indicated that no other organic vapors were present. The piping, all of which was above the ground, was removed back to Building #43. The associated equipment was also removed and the contents of the tank were pumped into the site's storm water management system. A backhoe was used to excavate and remove the tank. The tank cavity had been excavated in clay-type soils and the tank had been backfilled with sand and with some clay-type soils. A concrete slab lay at the bottom of the cavity. No contents from the tank or groundwater were noticed in the excavation.

The UST was in excellent condition with only a small area of minor corrosion on the upper part of the tank where it had been in contact with clay soils. The tank was loaded onto a truck for disposal off-site.

6.4 Groundwater Observations

No groundwater was observed in the cavities.

6.5 Free Product

No free product was seen in any of the cavities.

## 7.0 SAMPLE COLLECTION AND ANALYSIS

7.1 Sample Collection

Samples were taken according to the State Fire Marshal's and the Ohio Environmental Protection Agency's guidelines.

7.2 Details of Sample Collection

All of the samples were collected by hand. Three soil samples were collected from each tank cavity for laboratory analyses. One sample was collected from the middle of each cavity on top of the concrete slab. Two samples, one from each end of the cavity, were collected 6 to 12 inches below the top of the slab in each cavity.

The samples to be tested for volatile organics were placed in glass containers with septum lids; the samples for the rest of the analyses were placed in glass containers with Teflon-lined lids. All of the samples were placed on ice for transport. The site plan, showing sample locations, is attached.

7.3 Sample Screening

The soil samples and excavated materials were screened with a photo-ionization detector (PID) to measure the levels of organic vapors. The calibration curve for the PID is attached.

The PID showed no readings for the UST #1 cavity. PID readings were taken at 20-foot intervals along the piping to the test fire units. (Please see the attached drawing for exact sample collection locations and PID readings for these samples.)
Although the PID readings were minimal along the piping, readings up to 160 parts per million (ppm) were noted near the valves for the test fire units.

The PID readings of some of the excavated soils from the UST #3 cavity ranged from 10 to 15 ppm. The readings for the three soil samples from the bottom of the cavity were all 4 ppm.

No readings were found for any of the excavated materials or samples associated with UST #7.

7.4 Chain-of-Custody

Strict chain-of-custody was achieved by obtaining proper signatures as the samples were taken to the laboratory for analysis. Chain-of-custody documentation is attached.

7.5 Name and Affiliation of Person Collecting Samples

Mr. Jeffrey Floyd, a Bowser-Morner Associates, Inc. hydrogeologist, collected all of the samples.

7.6 Name and Affiliation of Third-Party Observer

Mr. Steve Meadows, Fire Inspector for the Miamisburg Fire Department, observed all of the UST removals.

7.7 Name, Address, and Telephone Number of Laboratory

Bowser-Morner, Inc., 4518 Taylorsville Road, Dayton, Ohio 45401
Telephone: (513) 236-8805

7.8 Laboratory Analyses and Results

Soil samples from the UST #1 cavity show elevated levels of iron. The total petroleum hydrocarbon levels are also elevated. No other parameters are higher than the expected background levels for the clay-type soils tested.

The analyses of the soil samples from the UST #3 cavity show low levels of organic solvents. All of the other parameters are within background levels for the clay-type soils tested.

Soil samples from the UST #7 cavity show very low levels of organic solvents. All of the other parameters are within background levels for the clay-type soil tested. The results of the laboratory tests of the samples collected when the UST's were removed are summarized in Tables 2-4. The laboratory reports are attached.

TABLE 2

LABORATORY RESULTS OF SAMPLES COLLECTED

DURING INITIAL EXCAVATION

UST #1

Result

| Parameter | East Bottom Cavity | Middle Bottom Cavity | West Bottom Cavity | Unit |
|---|---|---|---|---|
| Benzene | < 2 | < 2 | < 2 | ug/kg |
| Chloroform | < 10 | < 10 | < 10 | ug/kg |
| Ethylbenzene | < 2 | < 2 | < 2 | ug/kg |
| Methylene Chloride | < 50 | < 50 | < 50 | ug/kg |
| Tetrachloroethylene | < 25 | < 25 | < 25 | ug/kg |
| Toluene | < 2 | < 2 | 2 | ug/kg |
| Trans-1,2-Dichloroethylene | < 25 | < 25 | < 25 | ug/kg |
| 1,1,1-trichloroethane | < 25 | < 25 | < 25 | ug/kg |
| Trichloroethylene | < 25 | < 25 | < 25 | ug/kg |
| Xylene | < 2 | < 2 | < 2 | ug/kg |
| Acetone | < 500 | < 500 | < 500 | ug/kg |
| Methyl Ethyl Ketone | < 1000 | < 1000 | < 1000 | ug/kg |
| Methyl Isobutyl Ketone | < 500 | < 500 | < 500 | ug/kg |
| Mercury | < 0.02 | < 0.02 | < 0.02 | mg/kg |
| Arsenic | 4.3 | 5.2 | 5.8 | mg/kg |
| Selenium | < 0.4 | < 0.4 | < 0.4 | mg/kg |

(TABLE 2, LABORATORY RESULTS OF SAMPLES COLLECTED DURING INITIAL EXCAVATION, UST #1, Continued)

| Parameter | Result: East Bottom Cavity | Result: Middle Bottom Cavity | Result: West Bottom Cavity | Unit |
|---|---|---|---|---|
| Silver | 3.1 | 1.7 | 0.33 | mg/kg |
| Barium | 44 | 23 | 37 | mg/kg |
| Cadmium | 0.23 | 0.26 | 0.26 | mg/kg |
| Chromium | 11 | 10 | 13 | mg/kg |
| Lead | 3.0 | 3.0 | 3.2 | mg/kg |
| Sodium | 150 | 200 | 250 | mg/kg |
| Iron | 11,000 | 9,900 | 11,000 | mg/kg |
| Manganese | 210 | 190 | 170 | mg/kg |
| Total Petroleum Hydrocarbons | 50 | 175 | 60 | mg/kg |
| Phenol | < 0.15 | < 0.15 | < 0.15 | mg/kg |
| Cyanide | < 0.1 | < 0.1 | < 0.1 | mg/kg |
| Sulfide | < 1 | < 1 | < 1 | mg/kg |
| Total Solids | 94 | 95 | 95 | % |
| PCB's | < 0.04 | < 0.04 | < 0.04 | ug/kg |
| pH | 8.2 | 8.3 | 8.2 | S.U** |
| Flash Point | None to 210 | None to 210 | None to 210 | Degrees F |

*Below Practical Quantification Limits

**Standard Units

BOWSER MORNER

TABLE 3

LABORATORY RESULTS OF SAMPLES COLLECTED

DURING INITIAL EXCAVATION

UST #3

Result

| Parameter | Building End of Cavity | Middle of Cavity | Lot End of Cavity | Unit |
|---|---|---|---|---|
| Benzene | < 2 | < 2 | < 2 | ug/kg |
| Chloroform | 21 | 21 | < 10 | ug/kg |
| Ethylbenzene | < 2 | < 2 | < 2 | ug/kg |
| Methylene Chloride | < 50 | < 50 | < 50 | ug/kg |
| Tetrachloroethylene | < 25 | < 25 | < 25 | ug/kg |
| Toluene | < 2 | < 2 | < 2 | ug/kg |
| Trans-1,2-Dichloroethylene | < 25 | < 25 | < 25 | ug/kg |
| 1,1,1-trichloroethane | < 25 | < 25 | < 25 | ug/kg |
| Trichloroethylene | 53 | 210 | < 25 | ug/kg |
| Xylene | < 2 | < 2 | < 2 | ug/kg |
| Acetone | < 500 | < 500 | < 500 | ug/kg |
| Methyl Ethyl Ketone | < 1000 | < 1000 | < 1000 | ug/kg |
| Methyl Isobutyl Ketone | < 500 | < 500 | < 500 | ug/kg |
| Mercury | 0.17 | 0.06 | 0.03 | mg/kg |
| Arsenic | 2.3 | 2.4 | 5.8 | mg/kg |
| Selenium | < 0.4 | < 0.4 | < 0.4 | mg/kg |
| Silver | < 2 | < 2 | < 2 | mg/kg |

BOWSER MORNER

(TABLE 3, LABORATORY RESULTS OF SAMPLES COLLECTED DURING INITIAL EXCAVATION, UST #3, Continued)

| Parameter | Result: Building End of Cavity | Result: Middle of Cavity | Result: Lot End of Cavity | Unit |
|---|---|---|---|---|
| Barium | 16 | 8.5 | 38 | mg/kg |
| Cadmium | 0.61 | 0.44 | 0.41 | mg/kg |
| Chromium | 4.8 | 3.8 | 20 | mg/kg |
| Lead | 6.1 | 2.3 | 6.4 | mg/kg |
| Sodium | 95 | 140 | < 10 | mg/kg |
| Iron | 5,000 | 4,800 | 21,000 | mg/kg |
| Manganese | 100 | 120 | 470 | mg/kg |
| Total Petroleum Hydrocarbons | 75 | 560 | 35 | mg/kg |
| Phenol | < 0.15 | < 0.15 | < 0.15 | mg/kg |
| Cyanide | < 0.1 | < 0.1 | < 0.1 | mg/kg |
| Sulfide | < 1 | < 1 | < 1 | mg/kg |
| Total Solids | 93 | 96 | 87 | % |
| PCB's | 0.12 PCB 1254 | < 0.04 | < 0.04 | ug/kg |
| pH | 8.7 | 8.8 | 7.7 | S.U** |
| Flash Point | None to 210 | None to 210 | None to 210 | Degrees F |

*Below Practical Quantification Limits

**Standard Units

TABLE 4

LABORATORY RESULTS OF SAMPLES COLLECTED

DURING INITIAL EXCAVATION

UST #7

Result

| Parameter | North End of Cavity | Middle of Cavity | South End of Cavity | Unit |
|---|---|---|---|---|
| Benzene | < 2 | < 2 | < 2 | ug/kg |
| Chloroform | < 10 | 18 | 18 | ug/kg |
| Ethylbenzene | < 2 | < 2 | < 2 | ug/kg |
| Methylene Chloride | < 50 | < 50 | < 50 | ug/kg |
| Tetrachloroethylene | < 25 | < 25 | < 25 | ug/kg |
| Toluene | < 2 | 3 | < 2 | ug/kg |
| Trans-1,2-Dichloroethylene | < 25 | < 25 | < 25 | ug/kg |
| 1,1,1-trichloroethane | < 25 | < 25 | 31 | ug/kg |
| Trichloroethylene | < 25 | < 25 | < 25 | ug/kg |
| Xylene | < 2 | 3 | < 2 | ug/kg |
| Acetone | < 500 | < 500 | < 500 | ug/kg |
| Methyl Ethyl Ketone | < 1000 | < 1000 | < 1000 | ug/kg |
| Methyl Isobutyl Ketone | < 500 | < 500 | < 500 | ug/kg |
| Mercury | < 0.02 | < 0.02 | 0.03 | mg/kg |
| Arsenic | 1.2 | 1.6 | < 0.4 | mg/kg |
| Selenium | < 0.4 | < 0.4 | < 0.4 | mg/kg |
| Silver | < 2 | < 2 | < 2 | mg/kg |

(TABLE 4, LABORATORY RESULTS OF SAMPLES COLLECTED DURING INITIAL EXCAVATION, UST #7, Continued)

| Parameter | Result: North End of Cavity | Result: Middle of Cavity | Result: South End of Cavity | Unit |
|---|---|---|---|---|
| Barium | 4 | 5 | 12 | mg/kg |
| Cadmium | < 0.2 | < 0.2 | < 0.2 | mg/kg |
| Chromium | 1.8 | 2.4 | 5.1 | mg/kg |
| Lead | < 2 | < 2 | < 2 | mg/kg |
| Sodium | 53 | 64 | 87 | mg/kg |
| Iron | 2,000 | 2,600 | 4,400 | mg/kg |
| Manganese | 53 | 71 | 160 | mg/kg |
| Total Petroleum Hydrocarbons | 25 | 17 | 30 | mg/kg |
| Phenol | < 0.15 | < 0.15 | < 0.15 | mg/kg |
| Cyanide | < 0.1 | < 0.1 | < 0.1 | mg/kg |
| Sulfide | < 1 | < 1 | < 1 | mg/kg |
| Total Solids | 81 | 97 | 85 | % |
| PCB's | 0.15 PCB 1260 | < 0.04 | < 0.04 | ug/kg |
| pH | 8.0 | 7.8 | 7.5 | S.U** |
| Flash Point | None to 210 | None to 210 | None to 210 | Degrees F |

*Below Practical Quantification Limits

**Standard Units

BOWSER MORNER

## 8.0 CONCLUSIONS

Based on the findings of this preliminary closure assessment, additional remedial actions will be required at the former locations of UST #1 and UST #3. Elevated levels of petroleum hydrocarbons (TPH) are the primary concern that needs to be addressed.

The higher-than-normal level of TPH found in the UST #1 cavity indicates that a small release of product has occurred. This TPH level exceeds the Ohio State Fire Marshal's allowable level for clean closure. The elevated level of iron in the samples collected from the UST #1 cavity are probably due to rust from the tank. The excavated soils from this cavity will need to be disposed of as waste materials. This soil, and probably soils from further remedial actions, will be permitted to be disposed of in a sanitary landfill.

The low levels of organic solvents found in the soil samples from the UST #3 cavity will not show toxicity in Toxic Characteristic Leaching Procedure (TCLP) testing and these soils are not likely to be classified as hazardous waste. The State Fire Marshal will require additional remedial action to reduce the elevated levels of total petroleum hydrocarbons found at this location. All of the other parameters are within background levels for the clay-type soils tested. The excavated soils from this cavity will need to be disposed of as waste materials. The soils should be tested using the TCLP method to determine the proper method of disposal although they will probably be allowed to be disposed of in a sanitary landfill.

At the levels of organic solvents found in the samples from the UST #7 cavity, no further remedial action should be required. The other parameters tested for were all within background levels.

Thank you for selecting Bowser-Morner Associates, Inc. for this project. Your business is appreciated, and we look forward to working with you again soon. In the meantime, if you have any questions or if we can help you in any way, please let us know.

Sincerely,

Bowser-Morner Associates, Inc.

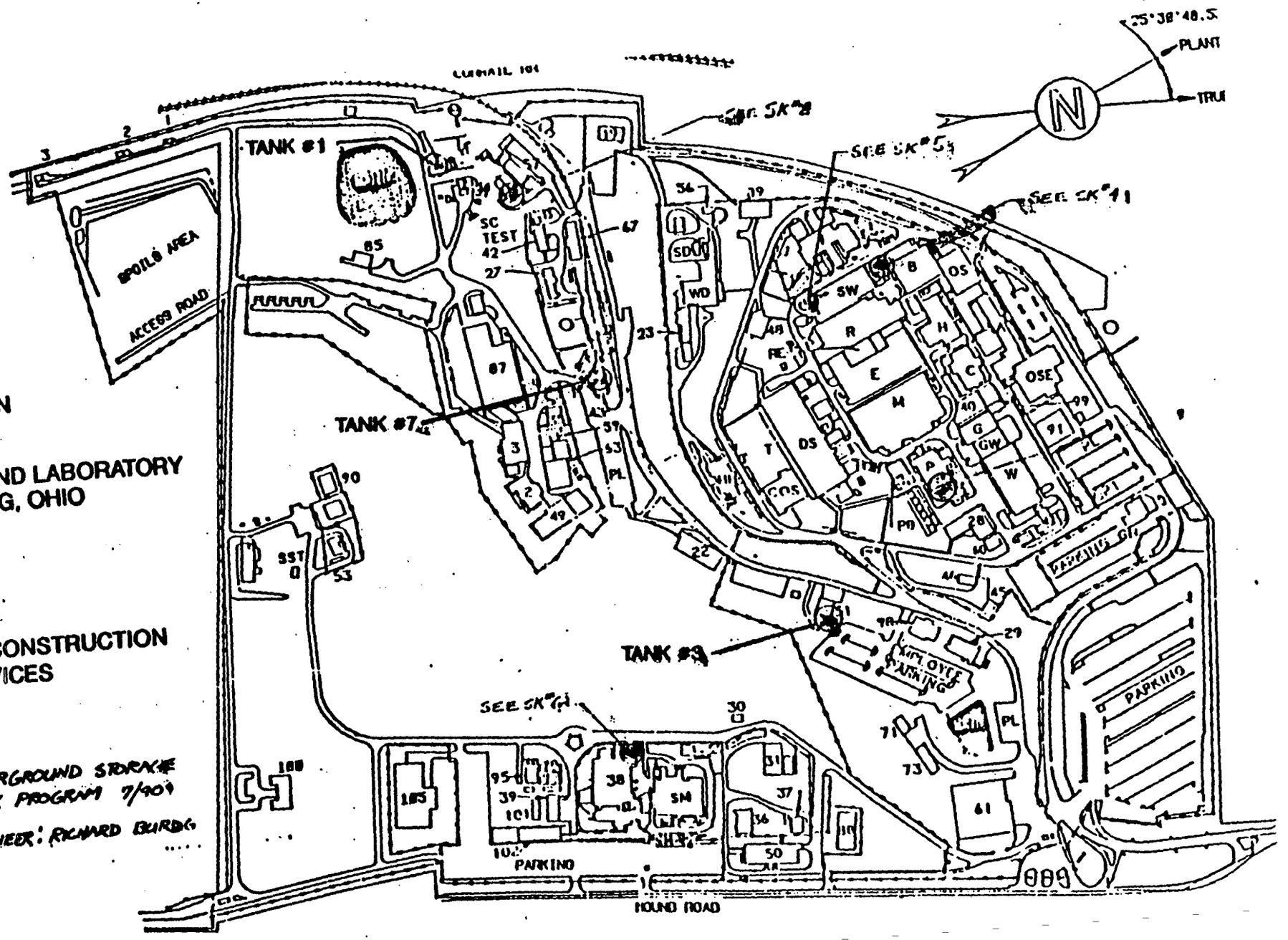
Jeffrey D. Floyd
Hydrogeologist
Project Manager

JDF/mwt
4-Client
2-File

BOWSER MORNER

SITE PLANS

BOWSER MORNER



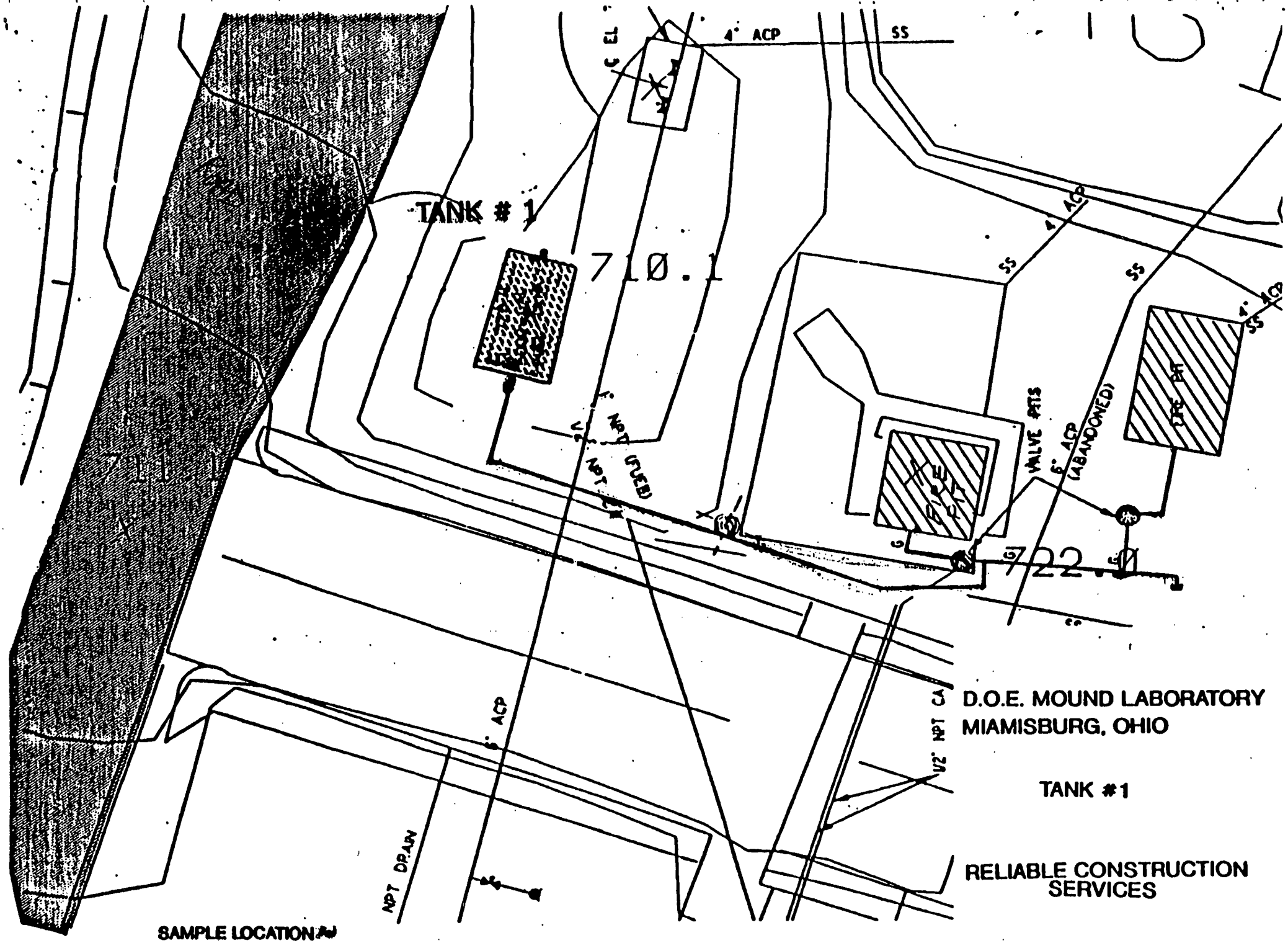

SITE PLAN

D.O.E. MOUND LABORATORY
MIAMISBURG, OHIO

RELIABLE CONSTRUCTION SERVICES

UNDERGROUND STORAGE TANK PROGRAM 7/90

ENGINEER: RICHARD BURDG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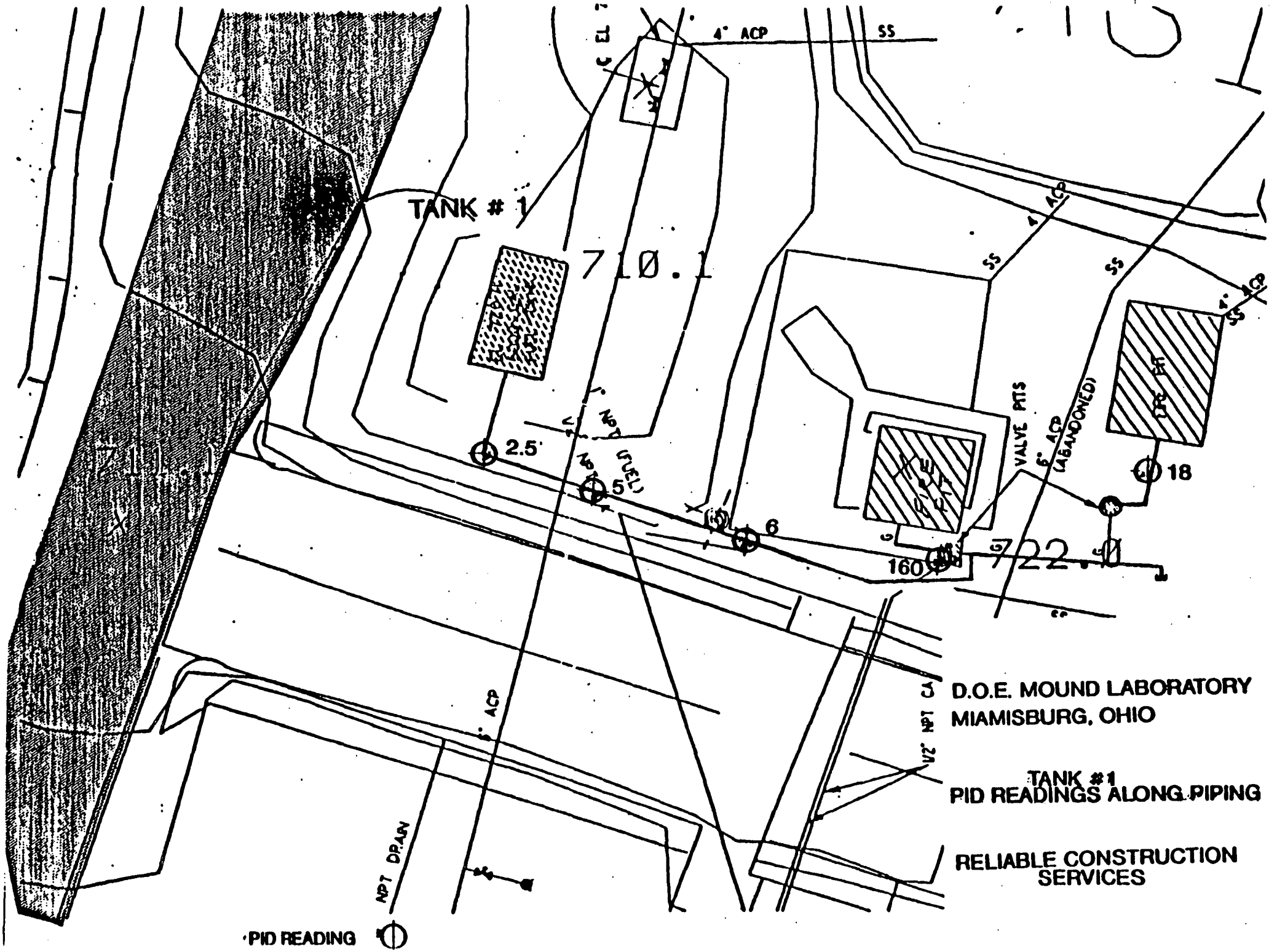
710.1
4" ACP
SS
4" ACP
SS
SS
4" ACP
SS
VALVE PITS
6" ACP (ABANDONED)
722
NPT (USED)
NPT
ACP
NPT DRAIN
1/2" NPT
D.O.E. MOUND LABORATORY
MIAMISBURG, OHIO
TANK #1
RELIABLE CONSTRUCTION SERVICES
SAMPLE LOCATION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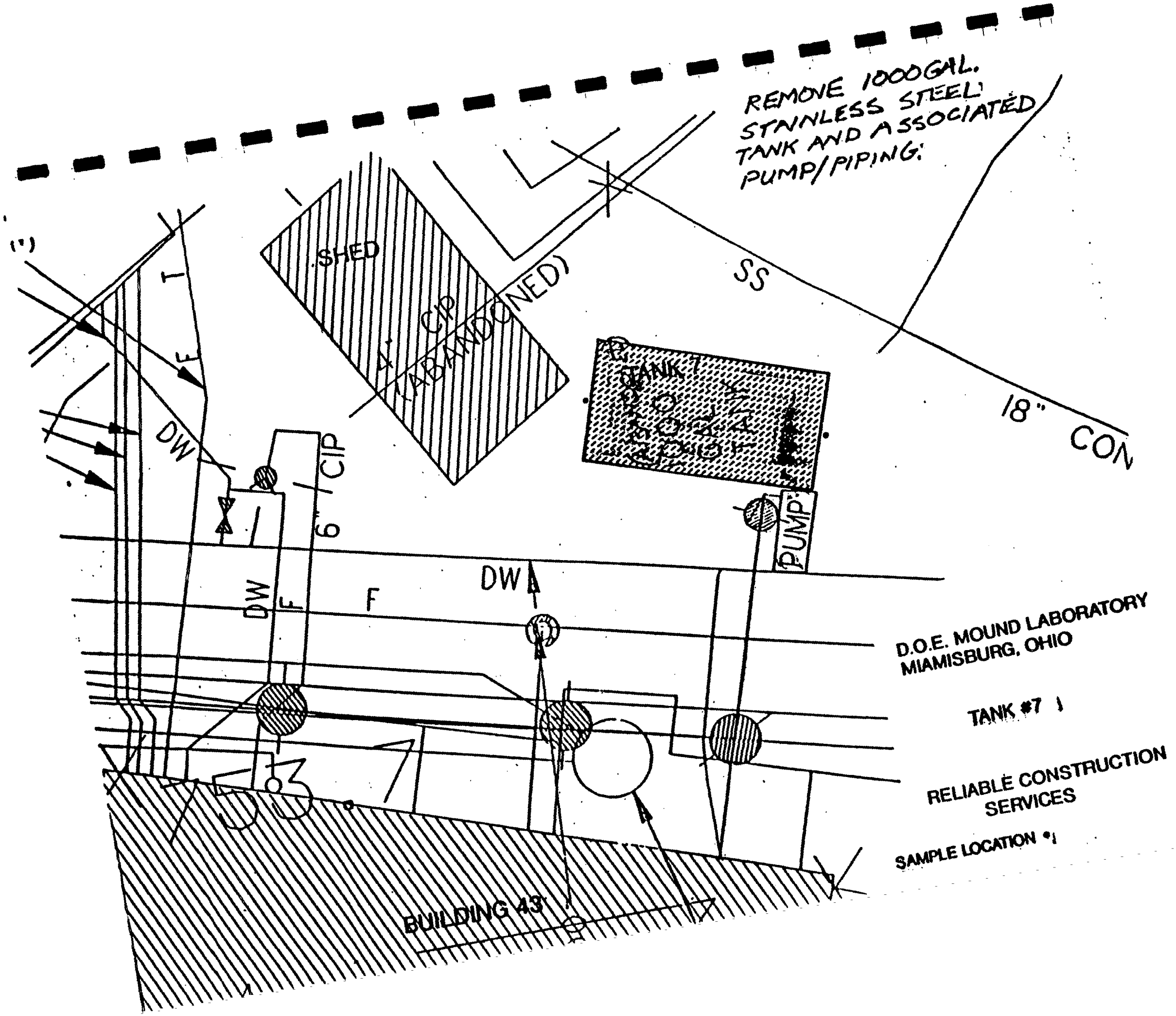
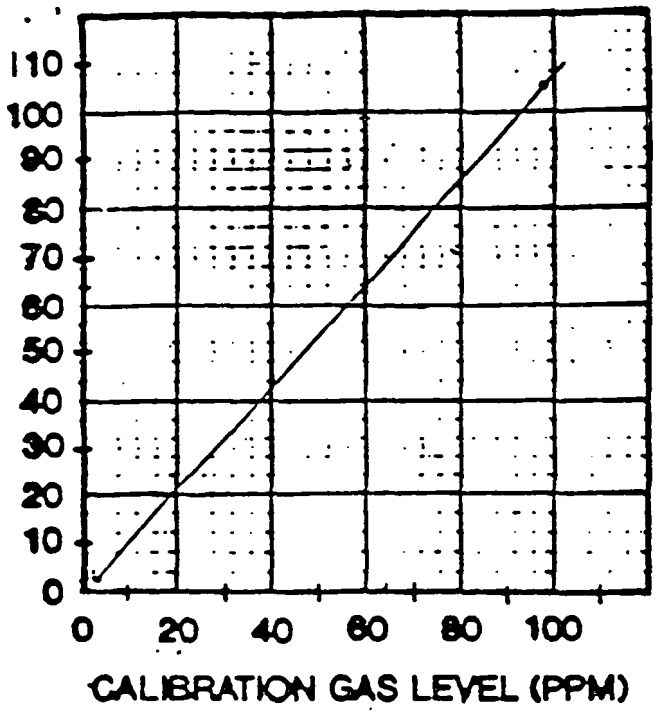
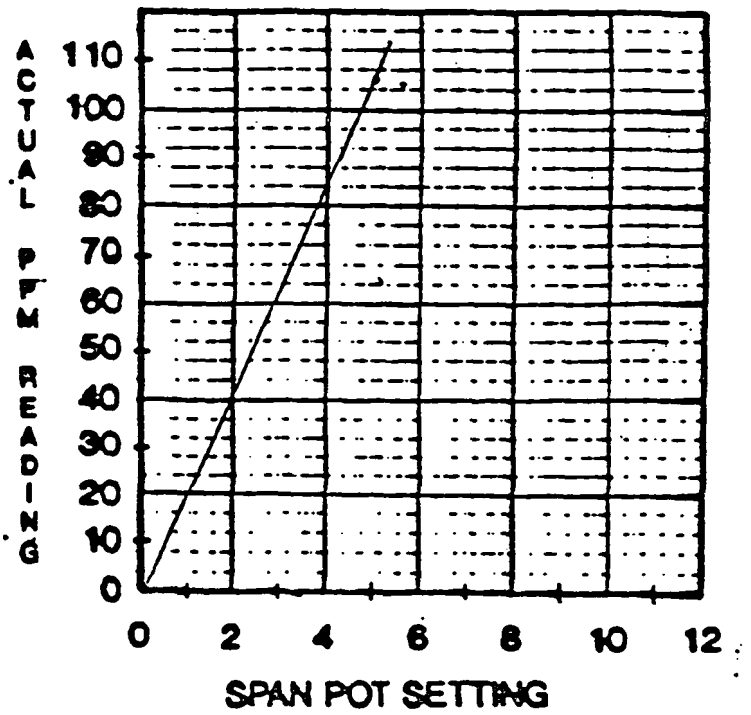
710.1
4" ACP
SS
4" ACP
SS
SS
4" ACP
SS
VALVE PITS
6" ACP (ABANDONED)
2.5'
5
6
160
18
722.0
ACP
NPT DRAIN
1/2" NPT
PID READING
D.O.E. MOUND LABORATORY
MIAMISBURG, OHIO
TANK #1
PID READINGS ALONG PIPING
RELIABLE CONSTRUCTION
SERVICES


REMOVE 1000GAL.
STAINLESS STEEL
TANK AND ASSOCIATED
PUMP/PIPING.
SHED
(ABANDONED)
SS
18" CON
TANK
PUMP
DW
CIP
DW
E
F
DW
D.O.E. MOUND LABORATORY
MIAMISBURG, OHIO
TANK #7
RELIABLE CONSTRUCTION
SERVICES
SAMPLE LOCATION #1
BUILDING 43

STANDARD CALIBRATION




SPAN POTENTIOMETER LINEARITY




**INSTRUMENT DESCRIPTION:** HNU PI 101 · 11.7ev

**MFG. SERIAL#:** AO 1242

**BOWSER MORNER SERIAL#:** 008505

**CALIBRATION DATE:** 10-31-90

**TECHNICIAN:** Sommer

# LABORATORY REPORTS

BOWSER MORNER

# BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 11/26/90
Lab. No.: 9010428 001
Sample No.: 55588
Authorization: WO#10813

On: One (1) Water Sample Submitted October 26, 1990 for Chemical Analysis.

Sample Identification: Tank #3 10-26-90

| ANALYTE | RESULT | UNITS | METHOD LIMIT |
|---|---|---|---|
| Volatile Organics | | | |
| Benzene | 39.6 | ug/L | 5 |
| Bromodichloromethane | BPQL | ug/L | 10 |
| Bromoform | BPQL | ug/L | 10 |
| Bromomethane | BPQL | ug/L | 5 |
| Carbon Tetrachloride | BPQL | ug/L | 10 |
| Chlorobenzene | BPQL | ug/L | 5 |
| Chloroethane | BPQL | ug/L | 10 |
| 2-Chloroethylvinyl Ether | BPQL | ug/L | 20 |
| Chloroform | 12.9 | ug/L | 10 |
| Chloromethane | BPQL | ug/L | 10 |
| cis-1,3-Dichloropropene | BPQL | ug/L | 5 |
| Dibromochloromethane | BPQL | ug/L | 5 |
| 1,1-Dichloroethane | BPQL | ug/L | 5 |
| 1,2-Dichloroethane | BPQL | ug/L | 5 |
| 1,1-Dichloroethylene | BPQL | ug/L | 5 |
| 1,2-Dichloropropane | BPQL | ug/L | 5 |
| Ethylbenzene | 220 | ug/L | 5 |
| Methylene Chloride | 260 | ug/L | 10 |
| 1,1,2,2-Tetrachloroethane | BPQL | ug/L | 5 |
| Tetrachloroethylene | 7.6 | ug/L | 5 |
| Toluene | 1900 | ug/L | 5 |
| trans-1,2-Dichloroethylene | 162 | ug/L | 5 |
| trans-1'3-Dichloropropene | BPQL | ug/L | 5 |
| 1,1,1-Trichloroethane | 10.4 | ug/L | 10 |
| 1,1,2-Trichloroethane | BPQL | ug/L | 5 |
| Trichloroethylene | 9100 | ug/L | 5 |
| Trichlorofluoromethane | BPQL | ug/L | 5 |
| Vinyl Chloride | BPQL | ug/L | 10 |

*The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.*

BOWSER-MORNER, INC.
CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

No: 9010428-001


| | | | |
|---|---|---|---|
| Xylene | 2400 | ug/L | 10 |
| Acetone | 2000 | mg/L | 100 |
| Acrolein | BPQL | ug/L | 20 |
| Acrylonitrile | BPQL | ug/L | 200 |
| Carbon Disulfide | BPQL | ug/L | 10 |
| Dibromomethane | BPQL | ug/L | 10 |
| Dichlorodifluoromethane | BPQL | ug/L | 10 |
| Methyl Butyl Ketone | BPQL | ug/L | 100 |
| Methyl Ethyl Ketone | 8400 | ug/L | 200 |
| Methyl Isobutyl Ketone | 13 | mg/L | 100 |
| Stryene | BPQL | ug/L | 10 |
| 1,2,3 Trichloropropane | BPQL | ug/L | 20 |
| Vinyl Acetate | BPQL | ug/L | 20 |

.....

SURROGATE STANDARD
...1,2-dichloroethane-d4
...Fluorobenzene
...Pentafluorobenzene
PERCENT RECOVERY 79 %

.....

— NOTES —
BPQL = Below Practical Quantitation Limits

---

| | | |
|---|---|---|
| Mercury | 0.002 | mg/L |
| Arsenic | <0.02 | mg/L |
| Selenium | <0.05 | mg/L |
| Silver | <0.1 | mg/L |
| Barium | <0.1 | mg/L |
| Cadmium | <0.01 | mg/L |
| Chromium | <0.01 | mg/L |
| Lead | <0.1 | mg/L |
| Sodium | 510 | mg/L |
| Iron | 8.7 | mg/L |
| Manganese | 0.13 | mg/L |
| Total Petroleum Hydrocarbons | 48 | mg/L |
| Phenol | <0.008 | mg/L |
| Cyanide | <0.01 | mg/L |
| Sulfide | 18 | mg/L |
| Total Solids | 14330 | mg/L |
| PCB | 150 | ug/L PCB 1260 |
| pH | 9.6 | |
| Flash Point Testing | No Flash | to 210' F |

*The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.*

# BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805




Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECW/ECW
1 -Client
2 -File


*The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.*

# BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 11/26/90
Lab. No.: 9010428 002
Sample No.: 55589
Authorization: WO#10813

On: One (1) Water Sample Submitted October 26, 1990 for Chemical Analysis.

Sample Identification: Tank #7 10-26-90

| ANALYTE | RESULT | UNITS | METHOD LIMIT |
|---|---|---|---|
| Volatile Organics | | | |
| Benzene | BPQL | ug/L | 5 |
| Bromodichloromethane | BPQL | ug/L | 10 |
| Bromoform | BPQL | ug/L | 10 |
| Bromomethane | BPQL | ug/L | 5 |
| Carbon Tetrachloride | BPQL | ug/L | 10 |
| Chlorobenzene | BPQL | ug/L | 5 |
| Chloroethane | BPQL | ug/L | 10 |
| 2-Chloroethylvinyl Ether | BPQL | ug/L | 20 |
| Chloroform | BPQL | ug/L | 10 |
| Chloromethane | BPQL | ug/L | 10 |
| cis-1,3-Dichloropropene | BPQL | ug/L | 5 |
| Dibromochloromethane | BPQL | ug/L | 5 |
| 1,1-Dichloroethane | BPQL | ug/L | 5 |
| 1,2-Dichloroethane | BPQL | ug/L | 5 |
| 1,1-Dichloroethylene | BPQL | ug/L | 5 |
| 1,2-Dichloropropane | BPQL | ug/L | 5 |
| Ethylbenzene | BPQL | ug/L | 5 |
| Methylene Chloride | BPQL | ug/L | 10 |
| 1,1,2,2-Tetrachloroethane | BPQL | ug/L | 5 |
| Tetrachloroethylene | BPQL | ug/L | 5 |
| Toluene | BPQL | ug/L | 5 |
| trans-1,2-Dichloroethylene | BPQL | ug/L | 5 |
| trans-1'3-Dichloropropene | BPQL | ug/L | 5 |
| 1,1,1-Trichloroethane | BPQL | ug/L | 10 |
| 1,1,2-Trichloroethane | BPQL | ug/L | 5 |
| Trichloroethylene | BPQL | ug/L | 5 |
| Trichlorofluoromethane | BPQL | ug/L | 5 |
| Vinyl Chloride | BPQL | ug/L | 10 |

*The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.*

BOWSER-MORNER, INC.
CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT No: 9010428-002



| | | | |
|---|---|---|---|
| Xylene | BPQL | ug/L | 10 |
| Acetone | BPQL | ug/L | 100 |
| Acrolein | BPQL | ug/L | 20 |
| Acrylonitrile | BPQL | ug/L | 200 |
| Carbon Disulfide | BPQL | ug/L | 10 |
| Dibromomethane | BPQL | ug/L | 10 |
| Dichlorodifluoromethane | BPQL | ug/L | 10 |
| Methyl Butyl Ketone | BPQL | ug/L | 100 |
| Methyl Ethyl Ketone | BPQL | ug/L | 200 |
| Methyl Isobutyl Ketone | BPQL | ug/L | 100 |
| Stryene | BPQL | ug/L | 10 |
| 1,2,3 Trichloropropane | BPQL | ug/L | 20 |
| Vinyl Acetate | BPQL | ug/L | 20 |

.....

SURROGATE STANDARD
...1,2-dichloroethane-d4
...Fluorobenzene
...Pentafluorobenzene
PERCENT RECOVERY 94 %

.....

— NOTES —
BPQL = Below Practical Quantitation Limits

---

| | | |
|---|---|---|
| Mercury | <0.001 | mg/L |
| Arsenic | <0.002 | mg/L |
| Selenium | 0.006 | mg/L |
| Silver | <0.1 | mg/L |
| Barium | <0.1 | mg/L |
| Cadmium | <0.01 | mg/L |
| Chromium | <0.01 | mg/L |
| Lead | <0.1 | mg/L |
| Sodium | 2.6 | mg/L |
| Iron | 0.26 | mg/L |
| Manganese | 0.02 | mg/L |
| Total Petroleum Hydrocarbons | <1 | mg/L |
| Phenol | 2.5 | mg/L |
| Cyanide | <0.01 | mg/L |
| Sulfide | 16 | mg/L |
| Total Solids | 19 | mg/L |
| PCB | <0.8 | ug/L |
| pH | 7.0 | |
| Flash Point Testing | No Flash | to 210' F |

*The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.*

# BOWSER-MORNER, INC.

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Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECW/ECW
1 -Client
2 -File


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BOWSER MORNER

BOWSER-MORNER
4518 Taylorsville Road
P.O. Box 51
Dayton, OH 45401-0838

# CHAIN OF CUSTODY RECORD

BOWSER-MORNER, INC., DISTRICT OFFICES
2416-B Overdrive
Lexington, KY 40510
122 S. St. Clair St
P.O. Box 838
Toledo, OH 43696

JOB NO. 10813

PROJECT NAME: Reliable Const. - Mound

SAMPLER'S (Signature): Jeffrey D Floyd

| BMI Sample No. | DATE | TIME | Composite | Grab | SAMPLE LOCATION/DESCRIPTION | NO. OF CONTAINERS | Preservatives: Sulfric Acid | Nitric Acid | Non-Preserved-Iced | Other | Container Type: 40 ml. VOA | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10/26/10 | | | X | tank 3 | 5 | | | | 3 | 2 | | | | |
| 1 | | | | X | tank 7 | 5 | | | | 3 | 2 | | | | |

| Relinquished by: (Signature) | Date/Time | Received by: (Signature) | Relinquished by: (Signature) | Date/Time | Received by: (Signature) |
|---|---|---|---|---|---|
| Jeffrey D Floyd | 10/26/10 11:14 | | | | |
| Relinquished by: (Signature) | Date/Time | Received by: (Signature) | Relinquished by: (Signature) | Date/Time | Received by: (Signature) |
| | | | | | |
| Relinquished by: (Signature) | Date/Time | Received for Laboratory by: (Signature) V. Thompson | Date/Time 10/26 11:14 | Cooler No. | Cooler Temp °C | Remarks: |

# BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/20/90
Lab. No.: 9011421 001
Sample No.: 58267
Authorization: WO#10813

On: One (1) Soil Sample Submitted November 29, 1990 for Chemical Analysis.

Sample Identification: #1 11-29-90 East Bottom TANK 1

| ANALYTE | RESULT | UNITS |
|---|---|---|
| Volatile Organics | | |
| Benzene | <25 | ug/Kg |
| Bromodichloromethane | <50 | ug/Kg |
| Bromoform | <50 | ug/Kg |
| Bromomethane | <25 | ug/Kg |
| Carbon Tetrachloride | <50 | ug/Kg |
| Chlorobenzene | <25 | ug/Kg |
| Chloroethane | <50 | ug/Kg |
| 2-Chloroethylvinyl Ether | <100 | ug/Kg |
| Chloroform | <10 | ug/Kg |
| Chloromethane | <50 | ug/Kg |
| cis-1,3-Dichloropropene | <25 | ug/Kg |
| Dibromochloromethane | <25 | ug/Kg |
| 1,1-Dichloroethane | <25 | ug/Kg |
| 1,2-Dichloroethane | <25 | ug/Kg |
| 1,1-Dichloroethylene | <25 | ug/Kg |
| 1,2-Dichloropropane | <25 | ug/Kg |
| Ethylbenzene | <25 | ug/Kg |
| Methylene Chloride | <50 | ug/Kg |
| 1,1,2,2-Tetrachloroethane | <25 | ug/Kg |
| Tetrachloroethylene | <25 | ug/Kg |
| Toluene | <25 | ug/Kg |
| trans-1,2-Dichloroethylene | <25 | ug/Kg |
| trans-1'3-Dichloropropene | <25 | ug/Kg |
| 1,1,1-Trichloroethane | <25 | ug/Kg |
| 1,1,2-Trichloroethane | <25 | ug/Kg |
| Trichloroethylene | <25 | ug/Kg |
| Trichlorofluoromethane | <25 | ug/Kg |
| Vinyl Chloride | <50 | ug/Kg |

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## LABORATORY REPORT

Lab No.: 9011421 001


| | | |
|---|---|---|
| Xylene | <50 | ug/Kg |
| Acetone | <500 | ug/Kg |
| Acrolein | <100 | ug/Kg |
| Acrylonitrile | <1000 | ug/Kg |
| Carbon Disulfide | <50 | ug/Kg |
| Dibromomethane | <50 | ug/Kg |
| Dichlorodifluoromethane | <50 | ug/Kg |
| Methyl Butyl Ketone | <500 | ug/Kg |
| Methyl Ethyl Ketone | <1000 | ug/Kg |
| Methyl Isobutyl Ketone | <500 | ug/Kg |
| Stryene | <50 | ug/Kg |
| 1,2,3 Trichloropropane | <100 | ug/Kg |
| Vinyl Acetate | <100 | ug/Kg |

.....

SURROGATE STANDARD
...1,2-dichloroethane-d4
...Fluorobenzene
...Pentafluorobenzene
PERCENT RECOVERY 119 %

.....

-- NOTES --
BPQL = Below Practical
Quantitation Limits

---

| | | |
|---|---|---|
| Arsenic | 4.3 | mg/Kg |
| Barium | 44 | mg/Kg |
| Cadmium | 0.23 | mg/Kg |
| Chromium | 11 | mg/Kg |
| Lead | 3.0 | mg/Kg |
| Mercury | <0.02 | mg/Kg |
| Selenium | <0.4 | mg/Kg |
| Silver | 3.1 | mg/Kg |
| Iron | 11000 | mg/Kg |
| Manganese | 210 | mg/Kg |
| Total Petroleum Hydrocarbons | 50 | mg/Kg |
| Free Liquids | None | |
| Phenol | <0.15 | mg/Kg |
| Cyanide | <0.1 | mg/Kg |
| Sulfide | <1 | mg/Kg |
| Total Solids | 94 | % |
| PCB | <0.04 | mg/Kg |

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## *LABORATORY REPORT* Lab No.: 9011421 001



| | | | |
|---|---|---|---|
| pH | 8.2 | | |
| Flash Point Testing | No Flash | to 210' F | |
| Sodium | 150 | mg/Kg | |
| Benzene | <2 | ug/Kg | GC/PID |
| Toluene | <2 | ug/Kg | GC/PID |
| Ethylbenzene | <2 | ug/Kg | GC/PID |
| Xylene | <2 | ug/Kg | GC/PID |

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECW/ECW
1 -Client
2 -File

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## LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/20/90
Lab. No.: 9011421 002
Sample No.: 58268
Authorization: WO#10813

On: One (1) Soil Sample Submitted November 29, 1990 for Chemical Analysis.

Sample Identification: #2 11-29-90 Middle Bottom _TANK 1

| ANALYTE | RESULT | UNITS |
|---|---|---|
| Volatile Organics | | |
| Benzene | <25 | ug/Kg |
| Bromodichloromethane | <50 | ug/Kg |
| Bromoform | <50 | ug/Kg |
| Bromomethane | <25 | ug/Kg |
| Carbon Tetrachloride | <50 | ug/Kg |
| Chlorobenzene | <25 | ug/Kg |
| Chloroethane | <50 | ug/Kg |
| 2-Chloroethylvinyl Ether | <100 | ug/Kg |
| Chloroform | <10 | ug/Kg |
| Chloromethane | <50 | ug/Kg |
| cis-1,3-Dichloropropene | <25 | ug/Kg |
| Dibromochloromethane | <25 | ug/Kg |
| 1,1-Dichloroethane | <25 | ug/Kg |
| 1,2-Dichloroethane | <25 | ug/Kg |
| 1,1-Dichloroethylene | <25 | ug/Kg |
| 1,2-Dichloropropane | <25 | ug/Kg |
| Ethylbenzene | <25 | ug/Kg |
| Methylene Chloride | <50 | ug/Kg |
| 1,1,2,2-Tetrachloroethane | <25 | ug/Kg |
| Tetrachloroethylene | <25 | ug/Kg |
| Toluene | <25 | ug/Kg |
| trans-1,2-Dichloroethylene | <25 | ug/Kg |
| trans-1'3-Dichloropropene | <25 | ug/Kg |
| 1,1,1-Trichloroethane | <25 | ug/Kg |
| 1,1,2-Trichloroethane | <25 | ug/Kg |
| Trichloroethylene | <25 | ug/Kg |
| Trichlorofluoromethane | <25 | ug/Kg |
| Vinyl Chloride | <50 | ug/Kg |

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| | | |
|---|---|---|
| Xylene | <50 | ug/Kg |
| Acetone | <500 | ug/Kg |
| Acrolein | <100 | ug/Kg |
| Acrylonitrile | <1000 | ug/Kg |
| Carbon Disulfide | <50 | ug/Kg |
| Dibromomethane | <50 | ug/Kg |
| Dichlorodifluoromethane | <50 | ug/Kg |
| Methyl Butyl Ketone | <500 | ug/Kg |
| Methyl Ethyl Ketone | <1000 | ug/Kg |
| Methyl Isobutyl Ketone | <500 | ug/Kg |
| Stryene | <50 | ug/Kg |
| 1,2,3 Trichloropropane | <100 | ug/Kg |
| Vinyl Acetate | <100 | ug/Kg |

.....

SURROGATE STANDARD
...1,2-dichloroethane-d4
...Fluorobenzene
...Pentafluorobenzene
PERCENT RECOVERY 99 %

.....

-- NOTES --
BPQL = Below Practical Quantitation Limits

---

| | | |
|---|---|---|
| Arsenic | 5.2 | mg/Kg |
| Barium | 23 | mg/Kg |
| Cadmium | 0.26 | mg/Kg |
| Chromium | 10 | mg/Kg |
| Lead | 3.0 | mg/Kg |
| Mercury | <0.02 | mg/Kg |
| Selenium | <0.4 | mg/Kg |
| Silver | 1.7 | mg/Kg |
| Iron | 9900 | mg/Kg |
| Manganese | 190 | mg/Kg |
| Total Petroleum Hydrocarbons | 175 | mg/Kg |
| Free Liquids | None | |
| Phenol | <0.15 | mg/Kg |
| Cyanide | <0.1 | mg/Kg |
| Sulfide | <1 | mg/Kg |
| Total Solids | 95 | % |
| PCB | <0.04 | mg/Kg |

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## LABORATORY REPORT

Lab No.: 9011421 002



| | | | |
|---|---|---|---|
| pH | 8.3 | | |
| Flash Point Testing | No Flash | to 210' F | |
| Sodium | 200 | mg/Kg | |
| Benzene | <2 | ug/Kg | GC/PID |
| Toluene | <2 | ug/Kg | GC/PID |
| Ethylbenzene | <2 | ug/Kg | GC/PID |
| Xylene | <2 | ug/Kg | GC/PID |

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECW/ECW
1 -Client
2 -File

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# BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/20/90
Lab. No.: 9011421 003
Sample No.: 58269
Authorization: WO#10813

On: One (1) Soil Sample Submitted November 29, 1990 for Chemical Analysis.

Sample Identification: #3 11-29-90 West Bottom TANK 1

| ANALYTE | RESULT | UNITS |
|---|---|---|
| Volatile Organics | | |
| Benzene | <25 | ug/Kg |
| Bromodichloromethane | <50 | ug/Kg |
| Bromoform | <50 | ug/Kg |
| Bromomethane | <25 | ug/Kg |
| Carbon Tetrachloride | <50 | ug/Kg |
| Chlorobenzene | <25 | ug/Kg |
| Chloroethane | <50 | ug/Kg |
| 2-Chloroethylvinyl Ether | <100 | ug/Kg |
| Chloroform | <10 | ug/Kg |
| Chloromethane | <50 | ug/Kg |
| cis-1,3-Dichloropropene | <25 | ug/Kg |
| Dibromochloromethane | <25 | ug/Kg |
| 1,1-Dichloroethane | <25 | ug/Kg |
| 1,2-Dichloroethane | <25 | ug/Kg |
| 1,1-Dichloroethylene | <25 | ug/Kg |
| 1,2-Dichloropropane | <25 | ug/Kg |
| Ethylbenzene | <25 | ug/Kg |
| Methylene Chloride | <50 | ug/Kg |
| 1,1,2,2-Tetrachloroethane | <25 | ug/Kg |
| Tetrachloroethylene | <25 | ug/Kg |
| Toluene | <25 | ug/Kg |
| trans-1,2-Dichloroethylene | <25 | ug/Kg |
| trans-1'3-Dichloropropene | <25 | ug/Kg |
| 1,1,1-Trichloroethane | <25 | ug/Kg |
| 1,1,2-Trichloroethane | <25 | ug/Kg |
| Trichloroethylene | <25 | ug/Kg |
| Trichlorofluoromethane | <25 | ug/Kg |
| Vinyl Chloride | <50 | ug/Kg |

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## LABORATORY REPORT

Lab No.: 9011421 003



| | | |
|---|---|---|
| Xylene | <50 | ug/Kg |
| Acetone | <500 | ug/Kg |
| Acrolein | <100 | ug/Kg |
| Acrylonitrile | <1000 | ug/Kg |
| Carbon Disulfide | <50 | ug/Kg |
| Dibromomethane | <50 | ug/Kg |
| Dichlorodifluoromethane | <50 | ug/Kg |
| Methyl Butyl Ketone | <500 | ug/Kg |
| Methyl Ethyl Ketone | <1000 | ug/Kg |
| Methyl Isobutyl Ketone | <500 | ug/Kg |
| Stryene | <50 | ug/Kg |
| 1,2,3 Trichloropropane | <100 | ug/Kg |
| Vinyl Acetate | <100 | ug/Kg |

.....

SURROGATE STANDARD

...1,2-dichloroethane-d4

...Fluorobenzene

...Pentafluorobenzene

PERCENT RECOVERY 104 %

.....

— NOTES —

BPQL = Below Practical Quantitation Limits

---

| | | |
|---|---|---|
| Arsenic | 5.8 | mg/Kg |
| Barium | 37 | mg/Kg |
| Cadmium | 0.26 | mg/Kg |
| Chromium | 13 | mg/Kg |
| Lead | 3.2 | mg/Kg |
| Mercury | <0.02 | mg/Kg |
| Selenium | <0.4 | mg/Kg |
| Silver | 0.33 | mg/Kg |
| Iron | 11000 | mg/Kg |
| Manganese | 170 | mg/Kg |
| Total Petroleum Hydrocarbons | 60 | mg/Kg |
| Free Liquids | None | |
| Phenol | <0.15 | mg/Kg |
| Cyanide | <0.1 | mg/Kg |
| Sulfide | <1 | mg/Kg |
| Total Solids | 95 | % |
| PCB | <0.04 | mg/Kg |

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# BOWSER-MORNER, INC.

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## *LABORATORY REPORT* Lab No.: 9011421 003



| | | | |
|---|---|---|---|
| pH | 8.2 | | |
| Flash Point Testing | No Flash | to 210' F | |
| Sodium | 250 | mg/Kg | |
| Benzene | <2 | ug/Kg | GC/PID |
| Toluene | 2 | ug/Kg | GC/PID |
| Ethylbenzene | <2 | ug/Kg | GC/PID |
| Xylene | <2 | ug/Kg | GC/PID |

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric G. Wiegert, Manager
Environmental Sciences Laboratory

ECW/ECW
1 -Client
2 -File

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BOWSER MORNER

BOWSER-MORNER
4518 Taylorsville Road
P.O. Box 51
Dayton, OH 45401-0838

# CHAIN OF CUSTODY RECORD

BOWSER-MORNER, INC., DISTRICT OFFICE
2416-B Overdrive
Lexington, KY 40510

122 S. St. Clair St.
P.O. Box 838
Toledo, OH 43696

JOB NO. 15813

PROJECT NAME: Reliable Const. - Mound

SAMPLER'S (Signature): Jeffrey D Floyd

| BMI Sample No. | DATE | TIME | Composite | Grab | SAMPLE LOCATION/DESCRIPTION | NO. OF CONTAINERS | Sulfric Acid | Nitric Acid | Non-Preserved-Iced | Other | 40 ml. VOA | 1 liter | Soil Vial | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11/27 | | | X | East Bottom | 2 | | | | | | 1 | 1 | | |
| 2 | 4/0 | | | X | Middle Bottom | 2 | | | | | | 1 | 1 | | |
| 3 | | | | X | West Bottom | 2 | | | | | | 1 | 1 | | |

| Relinquished by: (Signature) | Date/Time | Received by: (Signature) | Relinquished by: (Signature) | Date/Time | Received by: (Signature) |
|---|---|---|---|---|---|
| Jeffrey D Floyd | 11/27/90 4:25 | | | | |
| Relinquished by: (Signature) | Date/Time | Received by: (Signature) | Relinquished by: (Signature) | Date/Time | Received by: (Signature) |
| | | | | | |
| Relinquished by: (Signature) | Date/Time | Received for Laboratory by: (Signature) | Date/Time | Cooler No. | Cooler Temp.°C | Remarks: |
| | | [illegible] | 11/[illegible]/90 [illegible] | | | |

# BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/21/90
Lab. No.: 9012106 001
Sample No.: 58505
Authorization: WO#10813

On: One (1) Soil Sample Submitted for Chemical Analysis December 4, 1990.

Sample Identification: #1 12-4-90 Tank 3 Building End

| ANALYTE | RESULT | UNITS |
|---|---|---|
| Volatile Organics | | |
| Benzene | <25 | ug/Kg |
| Bromodichloromethane | <50 | ug/Kg |
| Bromoform | <50 | ug/Kg |
| Bromomethane | <25 | ug/Kg |
| Carbon Tetrachloride | <50 | ug/Kg |
| Chlorobenzene | <25 | ug/Kg |
| Chloroethane | <50 | ug/Kg |
| 2-Chloroethylvinyl Ether | <100 | ug/Kg |
| Chloroform | 21 | ug/Kg |
| Chloromethane | <50 | ug/Kg |
| cis-1,3-Dichloropropene | <25 | ug/Kg |
| Dibromochloromethane | <25 | ug/Kg |
| 1,1-Dichloroethane | <25 | ug/Kg |
| 1,2-Dichloroethane | <25 | ug/Kg |
| 1,1-Dichloroethylene | <25 | ug/Kg |
| 1,2-Dichloropropane | <25 | ug/Kg |
| Ethylbenzene | <25 | ug/Kg |
| Methylene Chloride | <50 | ug/Kg |
| 1,1,2,2-Tetrachloroethane | <25 | ug/Kg |
| Tetrachloroethylene | <25 | ug/Kg |
| Toluene | <25 | ug/Kg |
| trans-1,2-Dichloroethylene | <25 | ug/Kg |
| trans-1'3-Dichloropropene | <25 | ug/Kg |
| 1,1,1-Trichloroethane | <25 | ug/Kg |
| 1,1,2-Trichloroethane | <25 | ug/Kg |
| Trichloroethylene | 53 | ug/Kg |
| Trichlorofluoromethane | <25 | ug/Kg |

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# BOWSER-MORNER, INC.

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## LABORATORY REPORT

Lab No.: 9012106 001



| | | |
|---|---|---|
| Vinyl Chloride | <50 | ug/Kg |
| Xylene | <50 | ug/Kg |
| Acetone | <500 | ug/Kg |
| Acrolein | <100 | ug/Kg |
| Acrylonitrile | <1000 | ug/Kg |
| Carbon Disulfide | <50 | ug/Kg |
| Dibromomethane | <50 | ug/Kg |
| Dichlorodifluoromethane | <50 | ug/Kg |
| Methyl Butyl Ketone | <500 | ug/Kg |
| Methyl Ethyl Ketone | <1000 | ug/Kg |
| Methyl Isobutyl Ketone | <500 | ug/Kg |
| Stryene | <50 | ug/Kg |
| 1,2,3 Trichloropropane | <100 | ug/Kg |
| Vinyl Acetate | <100 | ug/Kg |

.....

SURROGATE STANDARD
...1,2-dichloroethane-d4
...Fluorobenzene
...Pentafluorobenzene
PERCENT RECOVERY 118 %

.....

-- NOTES --
BPQL = Below Practical Quantitation Limits

---

| | | |
|---|---|---|
| Arsenic | 2.3 | mg/Kg |
| Barium | 16 | mg/Kg |
| Cadmium | 0.61 | mg/Kg |
| Chromium | 4.8 | mg/Kg |
| Lead | 6.1 | mg/Kg |
| Mercury | 0.17 | mg/Kg |
| Selenium | <0.4 | mg/Kg |
| Silver | <2 | mg/Kg |
| Iron | 5000 | mg/Kg |
| Manganese | 100 | mg/Kg |
| Total Petroleum Hydrocarbons | 75 | mg/Kg |
| Free Liquids | None | |
| Cyanide | <0.1 | mg/Kg |
| Sulfide | <1 | mg/Kg |
| Total Solids | 93 | % |
| PCB | 0.12 | mg/Kg PCB 1254 |

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# BOWSER-MORNER, INC.

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## LABORATORY REPORT

Lab No.: 9012106 001



| | | | |
|---|---|---|---|
| pH | 8.7 | | |
| Flash Point Testing | No Flash | to 210' F | |
| Sodium | 95 | mg/Kg | |
| Phenol | <0.15 | mg/Kg | |
| Benzene | <2 | ug/Kg | GC/PID |
| Toluene | <2 | ug/Kg | GC/PID |
| Ethylbenzene | <2 | ug/Kg | GC/PID |
| Xylene | <2 | ug/Kg | GC/PID |

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECW/SAB
1 -Client
2 -File

The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.

# BOWSER-MORNER, INC.

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## LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/21/90
Lab. No.: 9012106 002
Sample No.: 58506
Authorization: WO#10813

On: One (1) Soil Sample Submitted for Chemical Analysis
December 4, 1990.

Sample Identification: #2 12-4-90 Tank 3 Middle

| ANALYTE | RESULT | UNITS |
|---|---|---|
| Volatile Organics | | |
| Benzene | <25 | ug/Kg |
| Bromodichloromethane | <50 | ug/Kg |
| Bromoform | <50 | ug/Kg |
| Bromomethane | <25 | ug/Kg |
| Carbon Tetrachloride | <50 | ug/Kg |
| Chlorobenzene | <25 | ug/Kg |
| Chloroethane | <50 | ug/Kg |
| 2-Chloroethylvinyl Ether | <100 | ug/Kg |
| Chloroform | 21 | ug/Kg |
| Chloromethane | <50 | ug/Kg |
| cis-1,3-Dichloropropene | <25 | ug/Kg |
| Dibromochloromethane | <25 | ug/Kg |
| 1,1-Dichloroethane | <25 | ug/Kg |
| 1,2-Dichloroethane | <25 | ug/Kg |
| 1,1-Dichloroethylene | <25 | ug/Kg |
| 1,2-Dichloropropane | <25 | ug/Kg |
| Ethylbenzene | <25 | ug/Kg |
| Methylene Chloride | <50 | ug/Kg |
| 1,1,2,2-Tetrachloroethane | <25 | ug/Kg |
| Tetrachloroethylene | <25 | ug/Kg |
| Toluene | <25 | ug/Kg |
| trans-1,2-Dichloroethylene | <25 | ug/Kg |
| trans-1'3-Dichloropropene | <25 | ug/Kg |
| 1,1,1-Trichloroethane | <25 | ug/Kg |
| 1,1,2-Trichloroethane | <25 | ug/Kg |
| Trichloroethylene | 210 | ug/Kg |
| Trichlorofluoromethane | <25 | ug/Kg |
| Vinyl Chloride | <50 | ug/Kg |

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## LABORATORY REPORT

Lab No.: 9012106 002



| | | |
|---|---|---|
| Xylene | <50 | ug/Kg |
| Acetone | <500 | ug/Kg |
| Acrolein | <100 | ug/Kg |
| Acrylonitrile | <1000 | ug/Kg |
| Carbon Disulfide | <50 | ug/Kg |
| Dibromomethane | <50 | ug/Kg |
| Dichlorodifluoromethane | <50 | ug/Kg |
| Methyl Butyl Ketone | <500 | ug/Kg |
| Methyl Ethyl Ketone | <1000 | ug/Kg |
| Methyl Isobutyl Ketone | <500 | ug/Kg |
| Stryene | <50 | ug/Kg |
| 1,2,3 Trichloropropane | <100 | ug/Kg |
| Vinyl Acetate | <100 | ug/Kg |

.....

SURROGATE STANDARD
...1,2-dichloroethane-d4
...Fluorobenzene
...Pentafluorobenzene

| | | |
|---|---|---|
| PERCENT RECOVERY | 100 | % |

.....

-- NOTES --
BPQL = Below Practical Quantitation Limits

---

| | | |
|---|---|---|
| Arsenic | 2.4 | mg/Kg |
| Barium | 8.5 | mg/Kg |
| Cadmium | 0.44 | mg/Kg |
| Chromium | 3.8 | mg/Kg |
| Lead | 2.3 | mg/Kg |
| Mercury | 0.06 | mg/Kg |
| Selenium | 0.40 | mg/Kg |
| Silver | <2 | mg/Kg |
| Iron | 4800 | mg/Kg |
| Manganese | 120 | mg/Kg |
| Total Petroleum Hydrocarbons | 560 | mg/Kg |
| Free Liquids | None | |
| Cyanide | <0.1 | mg/Kg |
| Sulfide | <1 | mg/Kg |
| Total Solids | 96 | % |
| PCB | <0.04 | mg/Kg |
| pH | 8.8 | |

*The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.*

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## *LABORATORY REPORT*

Lab No.: 9012106 002
Page 3

| | | | |
|---|---|---|---|
| Flash Point Testing | No Flash | to 210' F | |
| Sodium | 140 | mg/Kg | |
| Phenol | <0.15 | mg/Kg | |
| Benzene | <2 | ug/Kg | GC/PID |
| Toluene | <2 | ug/Kg | GC/PID |
| Ethylbenzene | <2 | ug/Kg | GC/PID |
| Xylene | <2 | ug/Kg | GC/PID |

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECW/SAB
1 -Client
2 -File

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# BOWSER-MORNER, INC.

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## LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/21/90
Lab. No.: 9012106 003
Sample No.: 58507
Authorization: WO#10813

On: One (1) Soil Sample Submitted for Chemical Analysis
December 4, 1990.

Sample Identification: #3 12-4-90 Tank 3 Lot End

| ANALYTE | RESULT | UNITS |
|---|---|---|
| Volatile Organics | | |
| Benzene | <25 | ug/Kg |
| Bromodichloromethane | <50 | ug/Kg |
| Bromoform | <50 | ug/Kg |
| Bromomethane | <25 | ug/Kg |
| Carbon Tetrachloride | <50 | ug/Kg |
| Chlorobenzene | <25 | ug/Kg |
| Chloroethane | <25 | ug/Kg |
| 2-Chloroethylvinyl Ether | <100 | ug/Kg |
| Chloroform | <10 | ug/Kg |
| Chloromethane | <50 | ug/Kg |
| cis-1,3-Dichloropropene | <25 | ug/Kg |
| Dibromochloromethane | <25 | ug/Kg |
| 1,1-Dichloroethane | <25 | ug/Kg |
| 1,2-Dichloroethane | <25 | ug/Kg |
| 1,1-Dichloroethylene | <25 | ug/Kg |
| 1,2-Dichloropropane | <25 | ug/Kg |
| Ethylbenzene | <25 | ug/Kg |
| Methylene Chloride | <50 | ug/Kg |
| 1,1,2,2-Tetrachloroethane | <25 | ug/Kg |
| Tetrachloroethylene | <25 | ug/Kg |
| Toluene | <25 | ug/Kg |
| trans-1,2-Dichloroethylene | <25 | ug/Kg |
| trans-1'3-Dichloropropene | <25 | ug/Kg |
| 1,1,1-Trichloroethane | <25 | ug/Kg |
| 1,1,2-Trichloroethane | <25 | ug/Kg |
| Trichloroethylene | <25 | ug/Kg |
| Trichlorofluoromethane | <25 | ug/Kg |
| Vinyl Chloride | <50 | ug/Kg |

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## LABORATORY REPORT

Lab No.: 9012106 003


| | | |
|---|---|---|
| Xylene | <50 | ug/Kg |
| Acetone | <500 | ug/Kg |
| Acrolein | <100 | ug/Kg |
| Acrylonitrile | <1000 | ug/Kg |
| Carbon Disulfide | <50 | ug/Kg |
| Dibromomethane | <50 | ug/Kg |
| Dichlorodifluoromethane | <50 | ug/Kg |
| Methyl Butyl Ketone | <500 | ug/Kg |
| Methyl Ethyl Ketone | <1000 | ug/Kg |
| Methyl Isobutyl Ketone | <500 | ug/Kg |
| Stryene | <50 | ug/Kg |
| 1,2,3 Trichloropropane | <100 | ug/Kg |
| Vinyl Acetate | <100 | ug/Kg |

.....

SURROGATE STANDARD
...1,2-dichloroethane-d4
...Fluorobenzene
...Pentafluorobenzene
PERCENT RECOVERY 106 %

.....

-- NOTES --
BPQL = Below Practical Quantitation Limits

---

| | | |
|---|---|---|
| Arsenic | 5.8 | mg/Kg |
| Barium | 38 | mg/Kg |
| Cadmium | 0.41 | mg/Kg |
| Chromium | 20 | mg/Kg |
| Lead | 6.4 | mg/Kg |
| Mercury | 0.03 | mg/Kg |
| Selenium | <0.4 | mg/Kg |
| Silver | <2 | mg/Kg |
| Iron | 21000 | mg/Kg |
| Manganese | 470 | mg/Kg |
| Total Petroleum Hydrocarbons | 35 | mg/Kg |
| Free Liquids | None | |
| Cyanide | <0.1 | mg/Kg |
| Sulfide | <1 | mg/Kg |
| Total Solids | 87 | % |
| PCB | <0.04 | mg/Kg |
| pH | 7.7 | |

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## LABORATORY REPORT

Lab No.: 9012106 003



| | | | |
|---|---|---|---|
| Flash Point Testing | No Flash | to 210' F | |
| Sodium | <10 | mg/Kg | |
| Phenol | <0.15 | mg/Kg | |
| Benzene | <2 | ug/Kg | GC/PID |
| Toluene | <2 | ug/Kg | GC/PID |
| Ethylbenzene | <2 | ug/Kg | GC/PID |
| Xylene | <2 | ug/Kg | GC/PID |

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric G. Wiegert, Manager
Environmental Sciences Laboratory

ECW/SAB
1 -Client
2 -File

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BOWSER MORNER

BOWSER-MORNER
4518 Taylorsville Road
P.O. Box 51
Dayton, OH 45401-0838

# CHAIN OF CUSTODY RECORD

BOWSER-MORNER, INC., DISTRICT OFFICES
2416-B Overdrive
Lexington, KY 40510
122 S. St. Clair St.
P.O. Box 838
Toledo, OH 43696

JOB NO. 108113

PROJECT NAME Reliable - Mound

SAMPLER'S (Signature) Jeffrey D Floyd

| BMI Sample No | DATE | TIME | Composite | Grab | SAMPLE LOCATION/DESCRIPTION | NO. OF CONTAINERS | Sulfric Acid | Nitric Acid | Non-Preserved-Iced | Other | 40 ml. VOA | 5gal/vol | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12/4/ | | | x | Tank 3, Sludge ~~[illegible]~~ end | 2 | | | | 1 | | 1 | | | |
| 2 | | | | x | tank 3, middle | 2 | | | | 1 | | 1 | | | |
| 3 | 90 | | | x | tank 3, Left end | 2 | | | | 1 | | 1 | | | |

| Relinquished by: (Signature) | Date/Time | Received by: (Signature) | Relinquished by: (Signature) | Date/Time | Received by: (Signature) |
|---|---|---|---|---|---|
| Jeffrey D Floyd | 12/4/90 3:30 | | | | |
| Relinquished by: (Signature) | Date/Time | Received by: (Signature) | Relinquished by: (Signature) | Date/Time | Received by: (Signature) |
| | | | | | |

| Relinquished by: (Signature) | Date/Time | Received for Laboratory by: (Signature) | Date/Time | Cooler No. | Cooler Temp °C | Remarks: |
|---|---|---|---|---|---|---|
| | | [illegible] | [illegible] | | | |

BOWSER-MORNER, INC.
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## LABORATORY REPORT

Lab No.: 9011421 004


| | | |
|---|---|---|
| Xylene | <50 | ug/Kg |
| Acetone | <500 | ug/Kg |
| Acrolein | <100 | ug/Kg |
| Acrylonitrile | <1000 | ug/Kg |
| Carbon Disulfide | <50 | ug/Kg |
| Dibromomethane | <50 | ug/Kg |
| Dichlorodifluoromethane | <50 | ug/Kg |
| Methyl Butyl Ketone | <500 | ug/Kg |
| Methyl Ethyl Ketone | <1000 | ug/Kg |
| Methyl Isobutyl Ketone | <500 | ug/Kg |
| Stryene | <50 | ug/Kg |
| 1,2,3 Trichloropropane | <100 | ug/Kg |
| Vinyl Acetate | <100 | ug/Kg |

.....

SURROGATE STANDARD
...1,2-dichloroethane-d4
...Fluorobenzene
...Pentafluorobenzene
PERCENT RECOVERY 105 %

.....

-- NOTES --
BPQL = Below Practical Quantitation Limits

---

| | | |
|---|---|---|
| Arsenic | 1.2 | mg/Kg |
| Barium | 4 | mg/Kg |
| Cadmium | <0.2 | mg/Kg |
| Chromium | 1.8 | mg/Kg |
| Lead | <2 | mg/Kg |
| Mercury | <0.02 | mg/Kg |
| Selenium | <0.4 | mg/Kg |
| Silver | <2 | mg/Kg |
| Iron | 2000 | mg/Kg |
| Manganese | 53 | mg/Kg |
| Total Petroleum Hydrocarbons | 25 | mg/Kg |
| Free Liquids | None | |
| Phenol | <0.15 | mg/Kg |
| Cyanide | <0.1 | mg/Kg |
| Sulfide | <1 | mg/Kg |
| Total Solids | 81 | % |
| PCB | 0.15 | mg/Kg PCB 1260 |

*The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.*

# BOWSER-MORNER, INC.

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## *LABORATORY REPORT*

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/21/90
Lab. No.: 9011421 004
Sample No.: 58360
Authorization: WO#10813

On: One (1) Soil Sample Submitted November 30, 1990 for Chemical Analysis.

Sample Identification: #1 11/30 Tank 7 North

| ANALYTE | RESULT | UNITS |
|---|---|---|
| Volatile Organics | | |
| Benzene | <25 | ug/Kg |
| Bromodichloromethane | <50 | ug/Kg |
| Bromoform | <50 | ug/Kg |
| Bromomethane | <25 | ug/Kg |
| Carbon Tetrachloride | <50 | ug/Kg |
| Chlorobenzene | <25 | ug/Kg |
| Chloroethane | <50 | ug/Kg |
| 2-Chloroethylvinyl Ether | <100 | ug/Kg |
| Chloroform | <10 | ug/Kg |
| Chloromethane | <50 | ug/Kg |
| cis-1,3-Dichloropropene | <25 | ug/Kg |
| Dibromochloromethane | <25 | ug/Kg |
| 1,1-Dichloroethane | <25 | ug/Kg |
| 1,2-Dichloroethane | <25 | ug/Kg |
| 1,1-Dichloroethylene | <25 | ug/Kg |
| 1,2-Dichloropropane | <25 | ug/Kg |
| Ethylbenzene | <25 | mg/Kg |
| Methylene Chloride | <50 | ug/Kg |
| 1,1,2,2-Tetrachloroethane | <25 | ug/Kg |
| Tetrachloroethylene | <25 | ug/Kg |
| Toluene | <25 | ug/Kg |
| trans-1,2-Dichloroethylene | <25 | ug/Kg |
| trans-1'3-Dichloropropene | <25 | ug/Kg |
| 1,1,1-Trichloroethane | <25 | ug/Kg |
| 1,1,2-Trichloroethane | <25 | ug/Kg |
| Trichloroethylene | <25 | ug/Kg |
| Trichlorofluoromethane | <25 | ug/Kg |
| Vinyl Chloride | <50 | ug/Kg |

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## LABORATORY REPORT

Lab No.: 9011421 004
Page 3

| | | | |
|---|---|---|---|
| pH | 8.0 | | |
| Flash Point Testing | No Flash | to 210' F | |
| Sodium | 53 | mg/Kg | |
| Benzene | <2 | ug/Kg | GC/PID |
| Toluene | <2 | ug/Kg | GC/PID |
| Ethylbenzene | <2 | ug/Kg | GC/PID |
| Xylene | <2 | ug/Kg | GC/PID |

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECW/SAB
1 -Client
2 -File

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# BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/21/90
Lab. No.: 9011421 006
Sample No.: 58362
Authorization: WO#10813

On: One (1) Soil Sample Submitted November 30, 1990 for Chemical Analysis.

Sample Identification: #3 1/30 Tank 7 Middle

| ANALYTE | RESULT | UNITS |
|---|---|---|
| Volatile Organics | | |
| Benzene | <25 | ug/Kg |
| Bromodichloromethane | <50 | ug/Kg |
| Bromoform | <50 | ug/Kg |
| Bromomethane | <25 | ug/Kg |
| Carbon Tetrachloride | <25 | ug/Kg |
| Chlorobenzene | <25 | ug/Kg |
| Chloroethane | <50 | ug/Kg |
| 2-Chloroethylvinyl Ether | <100 | ug/Kg |
| Chloroform | 18 | ug/Kg |
| Chloromethane | <50 | ug/Kg |
| cis-1,3-Dichloropropene | <25 | ug/Kg |
| Dibromochloromethane | <25 | ug/Kg |
| 1,1-Dichloroethane | <25 | ug/Kg |
| 1,2-Dichloroethane | <25 | ug/Kg |
| 1,1-Dichloroethylene | <25 | ug/Kg |
| 1,2-Dichloropropane | <25 | ug/Kg |
| Ethylbenzene | <25 | ug/Kg |
| Methylene Chloride | <50 | ug/Kg |
| 1,1,2,2-Tetrachloroethane | <25 | ug/Kg |
| Tetrachloroethylene | <25 | ug/Kg |
| Toluene | <25 | ug/Kg |
| trans-1,2-Dichloroethylene | <25 | ug/Kg |
| trans-1'3-Dichloropropene | <25 | ug/Kg |
| 1,1,1-Trichloroethane | <25 | ug/Kg |
| 1,1,2-Trichloroethane | <25 | ug/Kg |
| Trichloroethylene | <25 | ug/Kg |
| Trichlorofluoromethane | <25 | ug/Kg |
| Vinyl Chloride | <50 | ug/Kg |

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BOWSER-MORNER, INC.
CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

Lab No.: 9011421 006


| | | |
|---|---|---|
| Xylene | <50 | ug/Kg |
| Acetone | <500 | ug/Kg |
| Acrolein | <100 | ug/Kg |
| Acrylonitrile | <1000 | ug/Kg |
| Carbon Disulfide | <50 | ug/Kg |
| Dibromomethane | <50 | ug/Kg |
| Dichlorodifluoromethane | <50 | ug/Kg |
| Methyl Butyl Ketone | <500 | ug/Kg |
| Methyl Ethyl Ketone | <1000 | ug/Kg |
| Methyl Isobutyl Ketone | <500 | ug/Kg |
| Stryene | <50 | ug/Kg |
| 1,2,3 Trichloropropane | <100 | ug/Kg |
| Vinyl Acetate | <100 | ug/Kg |

.....

SURROGATE STANDARD
...1,2-dichloroethane-d4
...Fluorobenzene
...Pentafluorobenzene
PERCENT RECOVERY 109 %

.....

-- NOTES --
BPQL = Below Practical Quantitation Limits

---

| | | |
|---|---|---|
| Arsenic | 1.6 | mg/Kg |
| Barium | 5 | mg/Kg |
| Cadmium | <0.2 | mg/Kg |
| Chromium | 2.4 | mg/Kg |
| Lead | <2 | mg/Kg |
| Mercury | <0.02 | mg/Kg |
| Selenium | <0.4 | mg/Kg |
| Silver | <2 | mg/Kg |
| Iron | 2600 | mg/Kg |
| Manganese | 71 | mg/Kg |
| Total Petroleum Hydrocarbons | 17 | mg/Kg |
| Free Liquids | None | |
| Phenol | <0.15 | mg/Kg |
| Cyanide | <0.1 | mg/Kg |
| Sulfide | <1 | mg/Kg |
| Total Solids | 97 | % |
| PCB | <0.04 | mg/Kg |

*The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.*

# BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

Lab No.: 9011421 006
Page 3

| | | | |
|---|---|---|---|
| pH | 7.8 | | |
| Flash Point Testing | No Flash | to 210' F | |
| Sodium | 64 | mg/Kg | |
| Benzene | <2 | ug/Kg | GC/PID |
| Toluene | 3 | ug/Kg | GC/PID |
| Ethylbenzene | <2 | ug/Kg | GC/PID |
| Xylene | 3 | ug/Kg | GC/PID |

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECW/SAB
1 -Client
2 -File

*The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.*

# BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

To: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/21/90
Lab. No.: 9011421 005
Sample No.: 58361
Authorization: WO#10813

On: One (1) Soil Sample Submitted November 30, 1990 for Chemical Analysis.

Sample Identification: #2 1/30 Tank 7 South

| ANALYTE | RESULT | UNITS |
|---|---|---|
| Volatile Organics | | |
| Benzene | <25 | ug/Kg |
| Bromodichloromethane | <50 | ug/Kg |
| Bromoform | <50 | ug/Kg |
| Bromomethane | <25 | ug/Kg |
| Carbon Tetrachloride | <50 | ug/Kg |
| Chlorobenzene | <25 | ug/Kg |
| Chloroethane | <50 | ug/Kg |
| 2-Chloroethylvinyl Ether | <100 | ug/Kg |
| Chloroform | 18 | ug/Kg |
| Chloromethane | <50 | ug/Kg |
| cis-1,3-Dichloropropene | <25 | ug/Kg |
| Dibromochloromethane | <25 | ug/Kg |
| 1,1-Dichloroethane | <25 | uu/Kg |
| 1,2-Dichloroethane | <25 | ug/Kg |
| 1,1-Dichloroethylene | <25 | ug/Kg |
| 1,2-Dichloropropane | <25 | ug/Kg |
| Ethylbenzene | <25 | ug/Kg |
| Methylene Chloride | <50 | ug/Kg |
| 1,1,2,2-Tetrachloroethane | <25 | ug/Kg |
| Tetrachloroethylene | <25 | ug/Kg |
| Toluene | <25 | ug/Kg |
| trans-1,2-Dichloroethylene | <25 | ug/Kg |
| trans-1'3-Dichloropropene | <25 | ug/Kg |
| 1,1,1-Trichloroethane | 31 | ug/Kg |
| 1,1,2-Trichloroethane | <25 | ug/Kg |
| Trichloroethylene | <25 | ug/Kg |
| Trichlorofluoromethane | <25 | ug/Kg |
| Vinyl Chloride | <50 | ug/Kg |

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CORPORATE: 4518 Taylorsville Rd. • P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

Lab No.: 9011421 005


| | | |
|---|---|---|
| Xylene | <50 | ug/Kg |
| Acetone | <500 | ug/Kg |
| Acrolein | <100 | ug/Kg |
| Acrylonitrile | <1000 | ug/Kg |
| Carbon Disulfide | <50 | ug/Kg |
| Dibromomethane | <50 | ug/Kg |
| Dichlorodifluoromethane | <50 | ug/Kg |
| Methyl Butyl Ketone | <500 | ug/Kg |
| Methyl Ethyl Ketone | <1000 | ug/Kg |
| Methyl Isobutyl Ketone | <500 | ug/Kg |
| Stryene | <50 | ug/Kg |
| 1,2,3 Trichloropropane | <100 | ug/Kg |
| Vinyl Acetate | <100 | ug/Kg |

.....

SURROGATE STANDARD
...1,2-dichloroethane-d4
...Fluorobenzene
...Pentafluorobenzene
PERCENT RECOVERY 119 %

.....

-- NOTES --
BPQL = Below Practical Quantitation Limits

---

| | | |
|---|---|---|
| Arsenic | <0.4 | mg/Kg |
| Barium | 12 | mg/Kg |
| Cadmium | <0.2 | mg/Kg |
| Chromium | 5.1 | mg/Kg |
| Lead | <2 | mg/Kg |
| Mercury | 0.03 | mg/Kg |
| Selenium | <0.4 | mg/Kg |
| Silver | <2 | mg/Kg |
| Iron | 4400 | mg/Kg |
| Manganese | 160 | mg/Kg |
| Total Petroleum Hydrocarbons | 30 | mg/Kg |
| Free Liquids | None | |
| Phenol | <0.15 | mg/Kg |
| Cyanide | <0.1 | mg/Kg |
| Sulfide | <1 | mg/Kg |
| Total Solids | 85 | % |
| PCB | <0.04 | mg/Kg |

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## LABORATORY REPORT

Lab No.: 9011421 005
Page 3

| | | | |
|---|---|---|---|
| pH | 7.5 | | |
| Flash Point Testing | No Flash | to 210' F | |
| Sodium | 87 | mg/Kg | |
| Benzene | <2 | ug/Kg | GC/PID |
| Toluene | <2 | ug/Kg | GC/PID |
| Ethylbenzene | <2 | ug/Kg | GC/PID |
| Xylene | <2 | ug/Kg | GC/PID |

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert, Manager
Environmental Sciences Laboratory

ECW/SAB
1 -Client
2 -File

The above analysis was performed in accordance with procedures listed in Title 40 of the Code of Federal Regulations, Parts 136.3 and 261-Appendices II and III. In lieu of other arrangements, all samples recovered for this project will be retained at this laboratory for a period of 30 days. All reports remain the confidential property of BOWSER-MORNER, INC. and no publication or distribution may be made without our expressed written consent, except as authorized by contract.

BOWSER MORNER

BOWSER-MORNER
4518 Taylorsville Road
P.O. Box 51
Dayton, OH 45401-0838

# CHAIN OF CUSTODY RECORD

BOWSER-MORNER, INC., DISTRICT C.
2416-B Overdrive
Lexington, KY 40510

122 S. St. Clair St.
P.O. Box 936
Toledo, OH 43696

JOB NO.: 10813

PROJECT NAME: Rehabbe - Mound

SAMPLER'S (Signature): Jeffrey D Floyd

| BMI Sample No. | DATE | TIME | Composite | Grab | SAMPLE LOCATION/DESCRIPTION | NO. OF CONTAINERS | Sulfric Acid | Nitric Acid | Non-Preserved-Iced | Other | 40 ml. VOA | 5 ml Vol | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 11/29 | | | X | tank 7 North | 2 | | | X | | | 1 | | | SAME AS Sample |
| 2 | 30 | | | X | Tank 7 South | 2 | | | X | | | 1 | | | brought in 11-29-90 |
| 3 | | | | X | Tank 7 Middle | 2 | | | X | | | 1 | | | |

| Relinquished by: (Signature) | Date/Time | Received by: (Signature) | Relinquished by: (Signature) | Date/Time | Received by: (Signature) |
|---|---|---|---|---|---|
| Jeffrey D Floyd | 11/30/90 3:57 | | | | |
| Relinquished by: (Signature) | Date/Time | Received by: (Signature) | Relinquished by: (Signature) | Date/Time | Received by: (Signature) |
| | | | | | |

| Relinquished by: (Signature) | Date/Time | Received for Laboratory by: (Signature) | Date/Time | Cooler No. | Cooler Temp.°C | Remarks: |
|---|---|---|---|---|---|---|
| | | [illegible] | [illegible] | | | |

BOWSER MORNER

LEXINGTON DISTRICT
2416-B OVER DRIVE
LEXINGTON, KY 40510

CORPORATE OFFICE
P.O. BOX 51
DAYTON, OH 45401

TOLEDO DISTRICT
P.O. BOX 838
TOLEDO, OH 43696

# FACSIMILE TRANSMISSION

PANAFAX UF-260

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9

# BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Road• P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

TO: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/21/90
BMI No.: 9012106
Sample No.: 58505-07
Authorization : WO#10813

ON: Three (3) Samples Received December 4, 1990 for Chemical Analysis.

**SAMPLE IDENTIFICATION:**

#1 12-4-90 tank 3 Building End
#2 12-4-90 tank 3 Middle
#3 12-4-90 tank 3 Lot End

**TEST METHODS:**

### Organics

| | |
|---|---|
| Volatile Organics | Method 8240, GC/MS |
| B.T.E.X. | Method 8020, GC/PID |
| Total Petroleum Hydrocarbons | Method 9071/418.1 IR ** |
| PolyChlorinated Biphenyls | Method 8080, GC/ECD |

* Methods from EPA Document SW846 'Test Methods for Evaluating Solid Waste'
** Methods from EPA Document 600/4-79-020

### Trace Metals

| | | | |
|---|---|---|---|
| Arsenic | Method 7060 | Selenium | Method 7740 |
| Mercury | Method 7470 | Silver | Method 6010 |
| Barium | Method 6010 | Cadmium | Method 6010 |
| Chromium | Method 6010 | Lead | Method 6010 |
| Iron | Method 6010 | Manganese | Method 6010 |
| Sodium | Method 6010 | | |

* Methods from EPA Document SW846 'Test Methods for Evaluating Solid Waste'

### Inorganics/Physical

| | | | |
|---|---|---|---|
| Total Solids | Method 160.3** | PH | Method 9045 |
| Total Phenol | Method 9065 | Total Sulfide | Method 9030 |
| Total Cyanide | Method 9010 | Free Liquids | Methods 9095 |
| Flash Point | Method 1010 | | |

* Methods from EPA Document SW846 'Test Methods for Evaluating Solid Waste'
** Methods from EPA Document 600/4-79-020

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert, Manager
Environmental Sciences Laboratory

*ECW/ecw*
*1-Client*

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# BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Road• P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

TO: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 11/26/90
BMI No.: 9010428
Sample No.: 55588-89
Authorization : WO#10813

ON: Two (2) Samples Received October 26, 1990 for Chemical Analysis.

**SAMPLE IDENTIFICATION:**

Tank # 3 10-26-90
Tank # 7 10-26-90

**TEST METHODS:**

### Organics

| | |
|---|---|
| Volatile Organics | Method 8240, GC/MS |
| Total Petroleum Hydrocarbons | Method 9071/418.1 IR ** |
| PolyChlorinated Biphenyls | Method 8080, GC/ECD |

* Methods from EPA Document SW846 'Test Methods for Evaluating Solid Waste'
** Methods from EPA Document 600/4-79-020

### Trace Metals

| | | | |
|---|---|---|---|
| Arsenic | Method 7060 | Selenium | Method 7740 |
| Mercury | Method 7470 | Silver | Method 6010 |
| Barium | Method 6010 | Cadmium | Method 6010 |
| Chromium | Method 6010 | Lead | Method 6010 |
| Iron | Method 6010 | Manganese | Method 6010 |
| Sodium | Method 6010 | | |

* Methods from EPA Document SW846 'Test Methods for Evaluating Solid Waste'

### Inorganics/Physical

| | | | |
|---|---|---|---|
| Total Solids | Method 160.3** | PH | Method 9045 |
| Total Phenol | Method 9065 | Total Sulfide | Method 9030 |
| Total Cyanide | Method 9010 | Free Liquids | Methods 9095 |
| Flash Point | Method 1010 | | |

* Methods from EPA Document SW846 'Test Methods for Evaluating Solid Waste'
** Methods from EPA Document 600/4-79-020

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert, Manager
Environmental Sciences Laboratory

*ECW/acw*
*1-Client*

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# BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Road- P. O. Box 51 • Dayton, Ohio 45401 • 513/236-8805

## LABORATORY REPORT

TO: 10813 Reliable Const-Mound
Attn: Jeffrey Floyd

Date: 12/20/90
BMI No.: 9011421
Sample No.: 58267-69
Authorization : WO#10813

ON: Three (3) Samples Received November 29, 1990 for Chemical Analysis.

**SAMPLE IDENTIFICATION:**

#1 11-29-90 East Bottom
#2 11-29-90 Middle Bottom
#3 11-29-90 West Bottom

**TEST METHODS:**

### Organics

| | |
|---|---|
| Volatile Organics | Method 8240, GC/MS |
| B.T.E.X. | Method 8020, GC/PID |
| Total Petroleum Hydrocarbons | Method 9071/418.1 IR ** |
| PolyChlorinated Biphenyls | Method 8080, GC/ECD |

* Methods from EPA Document SW846 'Test Methods for Evaluating Solid Waste'
** Methods from EPA Document 600/4-79-020

### Trace Metals

| | | | |
|---|---|---|---|
| Arsenic | Method 7060 | Selenium | Method 7740 |
| Mercury | Method 7470 | Silver | Method 6010 |
| Barium | Method 6010 | Cadmium | Method 6010 |
| Chromium | Method 6010 | Lead | Method 6010 |
| Iron | Method 6010 | Manganese | Method 6010 |
| Sodium | Method 6010 | | |

* Methods from EPA Document SW846 'Test Methods for Evaluating Solid Waste'

### Inorganics/Physical

| | | | |
|---|---|---|---|
| Total Solids | Method 160.3** | PH | Method 9045 |
| Total Phenol | Method 9065 | Total Sulfide | Method 9030 |
| Total Cyanide | Method 9010 | Free Liquids | Methods 9095 |
| Flash Point | Method 1010 | | |

* Methods from EPA Document SW846 'Test Methods for Evaluating Solid Waste'
** Methods from EPA Document 600/4-79-020

Respectfully Submitted,
BOWSER-MORNER, INC.
Analytical Sciences Division

Eric C. Wiegert, Manager
Environmental Sciences Laboratory

*ECW/ecw*
*1-Client*

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# APPENDIX B

# OU3 LIMITED FIELD INVESTIGATION ANALYTICAL RESULTS

Project #2512 REA37057

0000037

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

0016-0001

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-001

Sample wt/vol: 5.0 (g/mL) G Lab File ID: E2635

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 21 Date Analyzed: 09/04/91

Column: (pack/cap) CAP Dilution Factor: 1.0

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 74-87-3 | Chloromethane | 13 | U |
| 74-83-9 | Bromomethane | 13 | U |
| 75-01-4 | Vinyl Chloride | 13 | U |
| 75-00-3 | Chloroethane | 13 | U |
| 75-09-2 | Methylene Chloride | 2 | BJ |
| 67-64-1 | Acetone | 69 | B |
| 75-15-0 | Carbon Disulfide | 6 | U |
| 75-35-4 | 1,1-Dichloroethene | 6 | U |
| 75-34-3 | 1,1-Dichloroethane | 6 | U |
| 540-59-0 | 1,2-Dichloroethene (total) | 6 | U |
| 67-66-3 | Chloroform | 6 | U |
| 107-06-2 | 1,2-Dichloroethane | 6 | U |
| 78-93-3 | 2-Butanone | 18 | |
| 71-55-6 | 1,1,1-Trichloroethane | 6 | U |
| 56-23-5 | Carbon Tetrachloride | 6 | U |
| 108-05-4 | Vinyl Acetate | 13 | U |
| 75-27-4 | Bromodichloromethane | 6 | U |
| 78-87-5 | 1,2-Dichloropropane | 6 | U |
| 10061-01-5 | cis-1,3-Dichloropropene | 6 | U |
| 79-01-6 | Trichloroethene | 6 | U |
| 124-48-1 | Dibromochloromethane | 6 | U |
| 79-00-5 | [illegible]richloroethane | 6 | U |
| 71-43-2 | [illegible] | 6 | U |
| 10061-02-6 | [illegible],3-Dichloropropene | 6 | U |
| 75-25-2 | Bromoform | 6 | U |
| 108-10-1 | 4-Methyl-2-Pentanone | 13 | U |
| 591-78-6 | 2-Hexanone | 13 | U |
| 127-18-4 | Tetrachloroethene | 6 | U |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 6 | U |
| 108-88-3 | Toluene | 6 | U |
| 108-90-7 | Chlorobenzene | 6 | U |
| 100-41-4 | Ethylbenzene | 6 | U |
| 100-42-5 | Styrene | 6 | U |
| 1330-20-7 | Xylene (total) | 6 | U |

1E

# VOLATILE ORGANICS ANALYSIS DATA SHEET
## TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0016-0001

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-001

Sample wt/vol: 5.0 (g/mL) G Lab File ID: E2635

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 21 Date Analyzed: 09/04/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| | | | | |

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
0000047

0016-5001

Lab Name: ITAS-ST.LOUIS Contract: G0626-DU3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) WATER Lab Sample ID: 1530-013

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: F2184

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. Date Analyzed: 09/04/91

Column: (pack/cap) CAP Dilution Factor: 1.0

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L | Q |
|---|---|---|---|
| 74-87-3 | Chloromethane | 10 | U |
| 74-83-9 | Bromomethane | 10 | U |
| 75-01-4 | Vinyl Chloride | 10 | U |
| 75-00-3 | Chloroethane | 10 | U |
| 75-09-2 | Methylene Chloride | 7 | B |
| 67-64-1 | Acetone | 10 | U |
| 75-15-0 | Carbon Disulfide | 5 | U |
| 75-35-4 | 1,1-Dichloroethene | 5 | U |
| 75-34-3 | 1,1-Dichloroethane | 5 | U |
| 540-59-0 | 1,2-Dichloroethene (total) | 5 | U |
| 67-66-3 | Chloroform | 5 | U |
| 107-06-2 | 1,2-Dichloroethane | 5 | U |
| 78-93-3 | 2-Butanone | 10 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 5 | U |
| 56-23-5 | Carbon Tetrachloride | 5 | U |
| 108-05-4 | Vinyl Acetate | 10 | U |
| 75-27-4 | Bromodichloromethane | 5 | U |
| 78-87-5 | 1,2-Dichloropropane | 5 | U |
| 10061-01-5 | cis-1,3-Dichloropropene | 5 | U |
| 79-01-6 | Trichloroethene | 5 | U |
| 124-48-1 | Dibromochloromethane | 5 | U |
| 79-00-5 | 1,1,2-Trichloroethane | 5 | U |
| 71-43-2 | Benzene | 5 | U |
| 10061-02-6 | trans-1,3-Dichloropropene | 5 | U |
| 75-25-2 | Bromoform | 5 | U |
| 108-10-1 | 4-Methyl-2-Pentanone | 10 | U |
| 591-78-6 | 2-Hexanone | 10 | U |
| 127-18-4 | Tetrachloroethene | 5 | U |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 5 | U |
| 108-88-3 | Toluene | 5 | U |
| 108-90-7 | Chlorobenzene | 5 | U |
| 100-41-4 | Ethylbenzene | 5 | U |
| 100-42-5 | Styrene | 5 | U |
| 1330-20-7 | Xylene (total) | 5 | U |

1A

# VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 000005

0017-0001

Lab Name: ITAS-ST.LOUIS  Contract: G0626-0U3-0001

Lab Code: ITSL  Case No.: V53001  SAS No.:  SDG No.: 0016-0001

Matrix: (soil/water) SOIL  Lab Sample ID: 1530-002

Sample wt/vol: 5.0 (g/mL) G  Lab File ID: E2636

Level: (low/med) LOW  Date Received: 08/29/91

% Moisture: not dec. 27  Date Analyzed: 09/04/91

Column: (pack/cap) CAP  Dilution Factor: 1.0

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 74-87-3 | Chloromethane | 14 | U |
| 74-83-9 | Bromomethane | 14 | U |
| 75-01-4 | Vinyl Chloride | 14 | U |
| 75-00-3 | Chloroethane | 14 | U |
| 75-09-2 | Methylene Chloride | 7 | U |
| 67-64-1 | Acetone | 240 | B |
| 75-15-0 | Carbon Disulfide | 4 | J |
| 75-35-4 | 1,1-Dichloroethene | 7 | U |
| 75-34-3 | 1,1-Dichloroethane | 7 | U |
| 540-59-0 | 1,2-Dichloroethene (total) | 7 | U |
| 67-66-3 | Chloroform | 7 | U |
| 107-06-2 | 1,2-Dichloroethane | 7 | U |
| 78-93-3 | 2-Butanone | 70 | |
| 71-55-6 | 1,1,1-Trichloroethane | 7 | U |
| 56-23-5 | Carbon Tetrachloride | 7 | U |
| 108-05-4 | Vinyl Acetate | 14 | U |
| 75-27-4 | Bromodichloromethane | 7 | U |
| 78-87-5 | 1,2-Dichloropropane | 7 | U |
| 10061-01-5 | cis-1,3-Dichloropropene | 7 | U |
| 79-01-6 | Trichloroethene | 7 | U |
| 124-48-1 | Dibromochloromethane | 7 | U |
| 79-00-5 | 1,1,2-Trichloroethane | 7 | U |
| 71-43-2 | Benzene | 7 | U |
| 10061-02-6 | trans-1,3-Dichloropropene | 7 | U |
| 75-25-2 | Bromoform | 7 | U |
| 108-10-1 | 4-Methyl-2-Pentanone | 14 | U |
| 591-78-6 | 2-Hexanone | 14 | U |
| 127-18-4 | Tetrachloroethene | 7 | U |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 7 | U |
| 108-88-3 | Toluene | 7 | U |
| 108-90-7 | Chlorobenzene | 7 | U |
| 100-41-4 | Ethylbenzene | 7 | U |
| 100-42-5 | Styrene | 7 | U |
| 1330-20-7 | Xylene (total) | 7 | U |

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0000056

0017-0001

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-002

Sample wt/vol: 5.0 (g/mL) G Lab File ID: E2636

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 27 Date Analyzed: 09/04/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | Unknown Alkane | 22.42 | 13 | J |
| 2. | UNKNOWN | 22.91 | 7 | J |

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0018-0001

Lab Name: ITAS-ST.LOUIS Contract: G0625-0U3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0018-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-003

Sample wt/vol: 5.0 (g/mL) G Lab File ID: E2637

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 22 Date Analyzed: 09/04/91

Column: (pack/cap) CAP Dilution Factor: 1.0

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 74-87-3 | Chloromethane | 13 | U |
| 74-83-9 | Bromomethane | 13 | U |
| 75-01-4 | Vinyl Chloride | 13 | U |
| 75-00-3 | Chloroethane | 13 | U |
| 75-09-2 | Methylene Chloride | 2 | BJ |
| 67-64-1 | Acetone | 250 | B |
| 75-15-0 | Carbon Disulfide | 6 | U |
| 75-35-4 | 1,1-Dichloroethene | 6 | U |
| 75-34-3 | 1,1-Dichloroethane | 6 | U |
| 540-59-0 | 1,2-Dichloroethene (total) | 6 | U |
| 67-66-3 | Chloroform | 6 | U |
| 107-06-2 | 1,2-Dichloroethane | 6 | U |
| 78-93-3 | 2-Butanone | 59 | |
| 71-55-6 | 1,1,1-Trichloroethane | 6 | U |
| 56-23-5 | Carbon Tetrachloride | 6 | U |
| 108-05-4 | Vinyl Acetate | 13 | U |
| 75-27-4 | Bromodichloromethane | 6 | U |
| 78-87-5 | 1,2-Dichloropropane | 6 | U |
| 10061-01-5 | cis-1,3-Dichloropropene | 6 | U |
| 79-01-6 | Trichloroethene | 6 | U |
| 124-48-1 | Dibromochloromethane | 6 | U |
| 79-00-5 | 1,1,2-Trichloroethane | 6 | U |
| 71-43-2 | Benzene | 6 | U |
| 10061-02-6 | trans-1,3-Dichloropropene | 6 | U |
| 75-25-2 | Bromoform | 6 | U |
| 108-10-1 | 4-Methyl-2-Pentanone | 13 | U |
| 591-78-6 | 2-Hexanone | 13 | U |
| 127-18-4 | Tetrachloroethene | 6 | U |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 6 | U |
| 108-88-3 | Toluene | 6 | U |
| 108-90-7 | Chlorobenzene | 6 | U |
| 100-41-4 | Ethylbenzene | 6 | U |
| 100-42-5 | Styrene | 6 | U |
| 1330-20-7 | Xylene (total) | 6 | U |

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0018-0001

Lab Name: ITAS-ST.LOUIS Contract: G0626-OU3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-003

Sample wt/vol: 5.0 (g/mL) G Lab File ID: E2637

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 22 Date Analyzed: 09/04/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|

0000077

EPA SAMPLE NO.

0019-0001

1A

# VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: ITAS-ST.LOUIS Contract: G0636-OUT-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-004

Sample wt/vol: 5.0 (g/mL) G Lab File ID: E2650

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 18 Date Analyzed: 09/05/91

Column: (pack/cap) CAP Dilution Factor: 1.0

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 74-87-3 | Chloromethane | 12 | U |
| 74-83-9 | Bromomethane | 12 | U |
| 75-01-4 | Vinyl Chloride | 12 | U |
| 75-00-3 | Chloroethane | 12 | U |
| 75-09-2 | Methylene Chloride | 5 | BJ |
| 67-64-1 | Acetone | 200 | B |
| 75-15-0 | Carbon Disulfide | 6 | U |
| 75-35-4 | 1,1-Dichloroethene | 6 | U |
| 75-34-3 | 1,1-Dichloroethane | 6 | U |
| 540-59-0 | 1,2-Dichloroethene (total) | 6 | U |
| 67-66-3 | Chloroform | 6 | U |
| 107-06-2 | 1,2-Dichloroethane | 6 | U |
| 78-93-3 | 2-Butanone | 53 | |
| 71-55-6 | 1,1,1-Trichloroethane | 6 | U |
| 56-23-5 | Carbon Tetrachloride | 6 | U |
| 108-05-4 | Vinyl Acetate | 12 | U |
| 75-27-4 | Bromodichloromethane | 6 | U |
| 78-87-5 | 1,2-Dichloropropane | 6 | U |
| 10061-01-5 | cis-1,3-Dichloropropene | 6 | U |
| 79-01-6 | Trichloroethene | 6 | U |
| 124-48-1 | Dibromochloromethane | 6 | U |
| 79-00-5 | 1,1,2-Trichloroethane | 6 | U |
| 71-43-2 | Benzene | 6 | U |
| 10061-02-6 | trans-1,3-Dichloropropene | 6 | U |
| 75-25-2 | Bromoform | 6 | U |
| 108-10-1 | 4-Methyl-2-Pentanone | 12 | U |
| 591-78-6 | 2-Hexanone | 12 | U |
| 127-18-4 | Tetrachloroethene | 6 | U |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 6 | U |
| 108-88-3 | Toluene | 6 | U |
| 108-90-7 | Chlorobenzene | 6 | U |
| 100-41-4 | Ethylbenzene | 6 | U |
| 100-42-5 | Styrene | 6 | U |
| 1330-20-7 | Xylene (total) | 6 | U |

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0019-0001

Lab Name: ITAS-ST.LOUIS Contract: 60626-0U3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-004

Sample wt/vol: 5.0 (g/mL) G Lab File ID: E2650

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 18 Date Analyzed: 09/05/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | Unknown Alkane | 22.45 | 15 | J |

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0019-1001

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-005

Sample wt/vol: 5.0 (g/mL) G Lab File ID: E2666

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 22 Date Analyzed: 09/06/91

Column: (pack/cap) CAP Dilution Factor: 1.0

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 74-87-3 | Chloromethane | 13 | U |
| 74-83-9 | Bromomethane | 13 | U |
| 75-01-4 | Vinyl Chloride | 13 | U |
| 75-00-3 | Chloroethane | 13 | U |
| 75-09-2 | Methylene Chloride | 7 | B |
| 67-64-1 | Acetone | 140 | B |
| 75-15-0 | Carbon Disulfide | 6 | U |
| 75-35-4 | 1,1-Dichloroethene | 6 | U |
| 75-34-3 | 1,1-Dichloroethane | 6 | U |
| 540-59-0 | 1,2-Dichloroethene (total) | 6 | U |
| 67-66-3 | Chloroform | 6 | U |
| 107-06-2 | 1,2-Dichloroethane | 6 | U |
| 78-93-3 | 2-Butanone | 31 | |
| 71-55-6 | 1,1,1-Trichloroethane | 6 | U |
| 56-23-5 | Carbon Tetrachloride | 6 | U |
| 108-05-4 | Vinyl Acetate | 13 | U |
| 75-27-4 | Bromodichloromethane | 6 | U |
| 78-87-5 | 1,2-Dichloropropane | 6 | U |
| 10061-01-5 | cis-1,3-Dichloropropene | 6 | U |
| 79-01-6 | Trichloroethene | 6 | U |
| 124-48-1 | Dibromochloromethane | 6 | U |
| 79-00-5 | 1,1,2-Trichloroethane | 6 | U |
| 71-43-2 | Benzene | 6 | U |
| 10061-02-6 | trans-1,3-Dichloropropene | 6 | U |
| 75-25-2 | Bromoform | 6 | U |
| 108-10-1 | 4-Methyl-2-Pentanone | 13 | U |
| 591-78-6 | 2-Hexanone | 13 | U |
| 127-18-4 | Tetrachloroethene | 6 | U |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 6 | U |
| 108-88-3 | Toluene | 6 | U |
| 108-90-7 | Chlorobenzene | 6 | U |
| 100-41-4 | Ethylbenzene | 6 | U |
| 100-42-5 | Styrene | 6 | U |
| 1330-20-7 | Xylene (total) | 6 | U |

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0019-1001

Lab Name: ITAS-ST.LOUIS Contract: 60636-0U3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-005

Sample wt/vol: 5.0 (g/mL) G Lab File ID: E2666

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 22 Date Analyzed: 09/06/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| | | | | |

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0016-0001

Lab Name: ITAS-ST.LOUIS Contract: G0626-OU3-0001

Lab Code: ITSL Case No.: S53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1081

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 21 dec. Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N pH: 7.5 Dilution Factor: 1.00

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 99-09-2 | 3-Nitroaniline | 2000 | U |
| 83-32-9 | Acenaphthene | 420 | U |
| 51-28-5 | 2,4-Dinitrophenol | 2000 | U |
| 100-02-7 | 4-Nitrophenol | 2000 | U |
| 132-64-9 | Dibenzofuran | 420 | U |
| 121-14-2 | 2,4-Dinitrotoluene | 420 | U |
| 84-66-2 | Diethylphthalate | 270 | BJ |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 420 | U |
| 86-73-7 | Fluorene | 420 | U |
| 100-10-6 | 4-Nitroaniline | 2000 | U |
| 534-52-1 | 4,6-Dinitro-2-Methylphenol | 2000 | U |
| 86-30-6 | N-Nitrosodiphenylamine (1) | 420 | U |
| 101-55-3 | 4-Bromophenyl-phenylether | 420 | U |
| 118-74-1 | Hexachlorobenzene | 420 | U |
| 87-86-5 | Pentachlorophenol | 2000 | U |
| 85-01-8 | Phenanthrene | 420 | U |
| 120-12-7 | Anthracene | 420 | U |
| 84-74-2 | Di-n-Butylphthalate | 420 | U |
| 206-44-0 | Fluoranthene | 420 | U |
| 129-00-0 | [illegible] | 420 | U |
| 85-68-7 | Butylbenzylphthalate | 420 | U |
| 91-94-1 | 3,3'-Dichlorobenzidine | 840 | U |
| 56-55-3 | Benzo(a)Anthracene | 420 | U |
| 218-01-9 | Chrysene | 420 | U |
| 117-81-7 | bis(2-Ethylhexyl)Phthalate | 420 | U |
| 117-84-0 | Di-n-Octyl Phthalate | 420 | U |
| 205-99-2 | Benzo(b)Fluoranthene | 420 | U |
| 207-08-9 | Benzo(k)Fluoranthene | 420 | U |
| 50-32-8 | Benzo(a)Pyrene | 420 | U |
| 193-39-5 | Indeno(1,2,3-cd)Pyrene | 420 | U |
| 53-70-3 | Dibenz(a,h)Anthracene | 420 | U |
| 191-24-2 | Benzo(g,h,i)Perylene | 420 | U |

(1) - Cannot be separated from Diphenylamine

1B

0000330

EPA SAMPLE NO.

# SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

0016-0001

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: S53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1081

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 21 dec. Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N pH: 7.5 Dilution Factor: 1.00

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 108-95-2 | Phenol | 420 | U |
| 111-44-4 | bis(2-Chloroethyl)Ether | 420 | U |
| 95-57-8 | 2-Chlorophenol | 420 | U |
| 541-73-1 | 1,3-Dichlorobenzene | 420 | U |
| 106-46-7 | 1,4-Dichlorobenzene | 420 | U |
| 100-51-6 | Benzyl Alcohol | 420 | U |
| 95-50-1 | 1,2-Dichlorobenzene | 420 | U |
| 95-48-7 | 2-Methylphenol | 420 | U |
| 39638-32-9 | bis(2-Chloroisopropyl)Ether | 420 | U |
| 106-44-5 | 4-Methylphenol | 420 | U |
| 621-64-7 | N-Nitroso-Di-n-Propylamine | 420 | U |
| 67-72-1 | Hexachloroethane | 420 | U |
| 98-95-3 | Nitrobenzene | 420 | U |
| 78-59-1 | Isophorone | 420 | U |
| 88-75-5 | 2-Nitrophenol | 420 | U |
| 105-67-9 | 2,4-Dimethylphenol | 420 | U |
| 65-85-0 | Benzoic Acid | 2000 | U |
| 111-91-1 | bis(2-Chloroethoxy)Methane | 420 | U |
| 120-83-2 | 2,4-Dichlorophenol | 420 | U |
| 120-82-1 | 1,2,4-Trichlorobenzene | 420 | U |
| 91-20-3 | Naphthalene | 420 | U |
| 106-47-8 | 4-Chloroaniline | 420 | U |
| 87-68-3 | Hexachlorobutadiene | 420 | U |
| 59-50-7 | 4-Chloro-3-Methylphenol | 420 | U |
| 91-57-6 | 2-Methylnaphthalene | 420 | U |
| 77-47-4 | Hexachlorocyclopentadiene | 420 | U |
| 88-06-2 | 2,4,6-Trichlorophenol | 420 | U |
| 95-95-4 | 2,4,5-Trichlorophenol | 2000 | U |
| 91-58-7 | 2-Chloronaphthalene | 420 | U |
| 88-74-4 | 2-Nitroaniline | 2000 | U |
| 131-11-3 | Dimethyl Phthalate | 420 | U |
| 208-96-8 | Acenaphthylene | 420 | U |
| 606-20-2 | 2,6-Dinitrotoluene | 420 | U |

1F

# SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
## TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0016-0001

Lab Name: ITAS-ST.LOUIS  Contract: G0626-0U3-0001

Lab Code: ITSL  Case No.: S53001  SAS No.:  SDG No.: 0016-0001

Matrix: (soil/water) SOIL  Lab Sample ID: 1530-001

Sample wt/vol: 30.0 (g/mL) G  Lab File ID: A1081

Level: (low/med) LOW  Date Received: 08/29/91

% Moisture: not dec. 21 dec.  Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC  Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N  pH: 7.5  Dilution Factor: 1.00

Number TICs found: 17

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. 0 | Aldol Condensation. | 4.54 | 49000 | BJ |
| 2. 0 | UNKNOWN | 5.62 | 770 | BJ |
| 3. 0 | UNKNOWN | 12.92 | 230 | BJ |
| 4. 0 | UNKNOWN | 13.20 | 200 | BJ |
| 5. 0 | UNKNOWN | 16.18 | 230 | BJ |
| 6. 0 | Unknown Hydrocarbon. | 20.26 | 1000 | BJ |
| 7. 10544500 | Sulfur, mol. (S8) (8CI9CI) | 21.50 | 1400 | J |
| 8. 0 | Unknown Hydrocarbon. | 25.19 | 1100 | BJ |
| 9. | Unknown Hydrocarbon. | 26.82 | 490 | J |
| 10. | Unknown Hydrocarbon. | 28.33 | 850 | J |
| 11. | Unknown Hydrocarbon. | 29.72 | 310 | J |
| 12. | Unknown Hydrocarbon. | 29.77 | 560 | J |
| 13. | UNKNOWN | 32.10 | 790 | J |
| 14. | Unknown Hydrocarbon. | 32.22 | 260 | J |
| 15. | Unknown Hydrocarbon. | 33.59 | 210 | J |
| 16. | Unknown Hydrocarbon. | 34.49 | 260 | J |
| 17. | Unknown Hydrocarbon. | 34.82 | 370 | J |

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0017-0001

Lab Name: ITAS-ST.LOUIS Contract: G0626-OU3-0001

Lab Code: ITSL Case No.: S53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1082

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 27 dec. Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N pH: 7.4 Dilution Factor: 1.00

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 99-09-2 | 3-Nitroaniline | 2200 | U |
| 83-32-9 | Acenaphthene | 47 | J |
| 51-28-5 | 2,4-Dinitrophenol | 2200 | U |
| 100-02-7 | 4-Nitrophenol | 2200 | U |
| 132-64-9 | Dibenzofuran | 450 | U |
| 121-14-2 | 2,4-Dinitrotoluene | 450 | U |
| 84-66-2 | Diethylphthalate | 290 | BJ |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 450 | U |
| 86-73-7 | Fluorene | 450 | U |
| 100-10-6 | 4-Nitroaniline | 2200 | U |
| 534-52-1 | 4,6-Dinitro-2-Methylphenol | 2200 | U |
| 86-30-6 | N-Nitrosodiphenylamine (1) | 450 | U |
| 101-55-3 | 4-Bromophenyl-phenylether | 450 | U |
| 118-74-1 | Hexachlorobenzene | 450 | U |
| 87-86-5 | Pentachlorophenol | 2200 | U |
| 85-01-8 | Phenanthrene | 450 | U |
| 120-12-7 | Anthracene | 450 | U |
| 84-74-2 | [illegible]tylphthalate | 450 | U |
| 206-44-0 | Fl[illegible]thene | 160 | J |
| 129-00-0 | Pyrene | 86 | J |
| 85-68-7 | Butylbenzylphthalate | 48 | J |
| 91-94-1 | 3,3'-Dichlorobenzidine | 900 | U |
| 56-55-3 | Benzo(a)Anthracene | 450 | U |
| 218-01-9 | Chrysene | 450 | U |
| 117-81-7 | bis(2-Ethylhexyl)Phthalate | 450 | U |
| 117-84-0 | Di-n-Octyl Phthalate | 450 | U |
| 205-99-2 | Benzo(b)Fluoranthene | 450 | U |
| 207-08-9 | Benzo(k)Fluoranthene | 450 | U |
| 50-32-8 | Benzo(a)Pyrene | 450 | U |
| 193-39-5 | Indeno(1,2,3-cd)Pyrene | 450 | U |
| 53-70-3 | Dibenz(a,h)Anthracene | 450 | U |
| 191-24-2 | Benzo(g,h,i)Perylene | 450 | U |

(1) - Cannot be separated from Diphenylamine

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0017-0001

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: S53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-002

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1082

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 27 dec. Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N pH: 7.4 Dilution Factor: 1.00

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | |
|---|---|---|---|
| 108-95-2 | Phenol | 450 | U |
| 111-44-4 | bis(2-Chloroethyl)Ether | 450 | U |
| 95-57-8 | 2-Chlorophenol | 450 | U |
| 541-73-1 | 1,3-Dichlorobenzene | 450 | U |
| 106-46-7 | 1,4-Dichlorobenzene | 450 | U |
| 100-51-6 | Benzyl Alcohol | 450 | U |
| 95-50-1 | 1,2-Dichlorobenzene | 450 | U |
| 95-48-7 | 2-Methylphenol | 450 | U |
| 39638-32-9 | bis(2-Chloroisopropyl)Ether | 450 | U |
| 106-44-5 | 4-Methylphenol | 450 | U |
| 621-64-7 | N-Nitroso-Di-n-Propylamine | 450 | U |
| 67-72-1 | Hexachloroethane | 450 | U |
| 98-95-3 | Nitrobenzene | 450 | U |
| 78-59-1 | Isophorone | 450 | U |
| 88-75-5 | 2-Nitrophenol | 450 | U |
| 105-67-9 | 2,4-Dimethylphenol | 450 | U |
| 65-85-0 | Benzoic Acid | 2200 | U |
| 111-91-1 | bis(2-Chloroethoxy)Methane | 450 | U |
| 120-83-2 | 2,4-Dichlorophenol | 450 | U |
| 120-82-1 | 1,2,4-Trichlorobenzene | 450 | U |
| 91-20-3 | Naphthalene | 450 | U |
| 106-47-8 | 4-Chloroaniline | 450 | U |
| 87-68-3 | Hexachlorobutadiene | 450 | U |
| 59-50-7 | 4-Chloro-3-Methylphenol | 450 | U |
| 91-57-6 | 2-Methylnaphthalene | 450 | U |
| 77-47-4 | Hexachlorocyclopentadiene | 450 | U |
| 88-06-2 | 2,4,6-Trichlorophenol | 450 | U |
| 95-95-4 | 2,4,5-Trichlorophenol | 2200 | U |
| 91-58-7 | 2-Chloronaphthalene | 450 | U |
| 88-74-4 | 2-Nitroaniline | 2200 | U |
| 131-11-3 | Dimethyl Phthalate | 450 | U |
| 208-96-8 | Acenaphthylene | 450 | U |
| 606-20-2 | 2,6-Dinitrotoluene | 450 | U |

1F

# SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
## TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0017-0001

Lab Name: ITAS-ST.LOUIS  Contract: G0626-0U3-0001

Lab Code: ITSL  Case No.: S53001  SAS No.:  SDG No.: 0016-0001

Matrix: (soil/water) SOIL  Lab Sample ID: 1530-002

Sample wt/vol: 30.0 (g/mL) G  Lab File ID: A1082

Level: (low/med) LOW  Date Received: 08/29/91

% Moisture: not dec. 27 dec.  Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC  Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N  pH: 7.4  Dilution Factor: 1.00

Number TICs found: 18

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. | Aldol Condensation. | 4.47 | 56000 | JA |
| 2. 0 | UNKNOWN | 5.61 | 860 | BJ |
| 3. 0 | UNKNOWN | 12.90 | 270 | BJ |
| 4. | UNKNOWN | 15.06 | 510 | J |
| 5. | UNKNOWN | 18.68 | 390 | J |
| 6. 57103 | Hexadecanoic acid (9CI) | 20.27 | 1200 | BJ |
| 7. | UNKNOWN | 21.04 | 310 | J |
| 8. | UNKNOWN | 21.21 | 670 | J |
| 9. | UNKNOWN | 21.25 | 450 | J |
| 10. | UNKNOWN | 21.30 | 460 | J |
| 11. | UNKNOWN | 21.35 | 500 | J |
| 12. 10544500 | Sulfur, mol. (S8) (8CI9CI) | 21.49 | 3400 | J |
| 13. 0 | Unknown Hydrocarbon. | 25.18 | 1500 | BJ |
| 14. | Unknown HydroCarbon. | 26.81 | 560 | J |
| 15. | [illegible] | 28.32 | 600 | J |
| 16. | [illegible] | 29.77 | 700 | J |
| 17. 83476 | [illegible]sterol or isomer | 32.09 | 1100 | J |
| 18. | UNKNOWN | 32.21 | 540 | J |

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0018-0001

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: 553001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-003

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1083

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 22 dec. Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N pH: 7.5 Dilution Factor: 1.00

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 99-09-2 | 3-Nitroaniline | 2100 | U |
| 83-32-9 | Acenaphthene | 420 | U |
| 51-28-5 | 2,4-Dinitrophenol | 2100 | U |
| 100-02-7 | 4-Nitrophenol | 2100 | U |
| 132-64-9 | Dibenzofuran | 420 | U |
| 121-14-2 | 2,4-Dinitrotoluene | 420 | U |
| 84-66-2 | Diethylphthalate | 360 | BJ |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 420 | U |
| 86-73-7 | Fluorene | 420 | U |
| 100-10-6 | 4-Nitroaniline | 2100 | U |
| 534-52-1 | 4,6-Dinitro-2-Methylphenol | 2100 | U |
| 86-30-6 | N-Nitrosodiphenylamine (1) | 420 | U |
| 101-55-3 | 4-Bromophenyl-phenylether | 420 | U |
| 118-74-1 | Hexachlorobenzene | 420 | U |
| 87-86-5 | Pentachlorophenol | 2100 | U |
| 85-01-8 | Phenanthrene | 420 | U |
| 120-12-7 | Anthracene | 420 | U |
| 84-74-2 | Di-n-Butylphthalate | 420 | U |
| 206-44-0 | Fluoranthene | 420 | U |
| 129-00-0 | Pyrene | 420 | U |
| 85-68-7 | Butylbenzylphthalate | 420 | U |
| 91-94-1 | 3,3'-Dichlorobenzidine | 850 | U |
| 56-55-3 | Benzo(a)Anthracene | 420 | U |
| 218-01-9 | Chrysene | 420 | U |
| 117-81-7 | bis(2-Ethylhexyl)Phthalate | 420 | U |
| 117-84-0 | Di-n-Octyl Phthalate | 420 | U |
| 205-99-2 | Benzo(b)Fluoranthene | 420 | U |
| 207-08-9 | Benzo(k)Fluoranthene | 420 | U |
| 50-32-8 | Benzo(a)Pyrene | 420 | U |
| 193-39-5 | Indeno(1,2,3-cd)Pyrene | 420 | U |
| 53-70-3 | Dibenz(a,h)Anthracene | 420 | U |
| 191-24-2 | Benzo(g,h,i)Perylene | 420 | U |

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0018-0001

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: S53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-003

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1083

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 22 dec. Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N pH: 7.5 Dilution Factor: 1.00

Number TICs found: 18

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. 0 | Aldol Condensation. | 4.53 | 47000 | BJA |
| 2. 0 | UNKNOWN | 5.61 | 740 | BJ |
| 3. 0 | UNKNOWN | 12.90 | 280 | BJ |
| 4. 0 | UNKNOWN | 16.18 | 340 | BJ |
| 5. 57103 | Hexadecanoic acid (9CI) | 20.26 | 960 | BJ |
| 6. | UNKNOWN | 21.16 | 340 | J |
| 7. | UNKNOWN | 21.27 | 460 | J |
| 8. | UNKNOWN | 21.34 | 350 | J |
| 19. 10544500 | Sulfur, mol. (S8) (8CI9CI) | 21.48 | 2500 | J |
| 10. 0 | UNKNOWN | 25.17 | 880 | BJ |
| 11. | Unknown Hydrocarbon. | 26.81 | 610 | J |
| 12. | Unknown Hydrocarbon. | 28.32 | 1000 | J |
| 13. | Unknown Hydrocarbon. | 29.71 | 530 | J |
| 14. | Unknown Hydrocarbon. | 29.77 | 500 | J |
| 15. | Unknown Hydrocarbon. | 31.32 | 370 | J |
| 16. 83476 | [illegible] sterol or isomer | 32.11 | 2000 | J |
| 17. | [illegible] | 32.21 | 690 | J |
| 18. | [illegible] ocarbon. | 32.66 | 510 | J |

1C

# SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0019-0001

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: S53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-004

Sample wt/vol: 30.2 (g/mL) G Lab File ID: A1084

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 18 dec. Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N pH: 7.5 Dilution Factor: 1.00

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 99-09-2 | 3-Nitroaniline | 1900 | U |
| 83-32-9 | Acenaphthene | 400 | U |
| 51-28-5 | 2,4-Dinitrophenol | 1900 | U |
| 100-02-7 | 4-Nitrophenol | 1900 | U |
| 132-64-9 | Dibenzofuran | 400 | U |
| 121-14-2 | 2,4-Dinitrotoluene | 400 | U |
| 84-66-2 | Diethylphthalate | 230 | BJ |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 400 | U |
| 86-73-7 | Fluorene | 400 | U |
| 100-10-6 | 4-Nitroaniline | 1900 | U |
| 534-52-1 | 4,6-Dinitro-2-Methylphenol | 1900 | U |
| 86-30-6 | N-Nitrosodiphenylamine (1) | 400 | U |
| 101-55-3 | 4-Bromophenyl-phenylether | 400 | U |
| 118-74-1 | Hexachlorobenzene | 400 | U |
| 87-86-5 | Pentachlorophenol | 1900 | U |
| 85-01-8 | Phenanthrene | 400 | U |
| 120-12-7 | Anthracene | 400 | U |
| 84-74-2 | [illegible]tylphthalate | 400 | U |
| 206-44-0 | [illegible]thene | 400 | U |
| 129-00-0 | Pyrene | 400 | U |
| 85-68-7 | Butylbenzylphthalate | 400 | U |
| 91-94-1 | 3,3'-Dichlorobenzidine | 800 | U |
| 56-55-3 | Benzo(a)Anthracene | 400 | U |
| 218-01-9 | Chrysene | 400 | U |
| 117-81-7 | bis(2-Ethylhexyl)Phthalate | 400 | U |
| 117-84-0 | Di-n-Octyl Phthalate | 400 | U |
| 205-99-2 | Benzo(b)Fluoranthene | 400 | U |
| 207-08-9 | Benzo(k)Fluoranthene | 400 | U |
| 50-32-8 | Benzo(a)Pyrene | 400 | U |
| 193-39-5 | Indeno(1,2,3-cd)Pyrene | 400 | U |
| 53-70-3 | Dibenz(a,h)Anthracene | 400 | U |
| 191-24-2 | Benzo(g,h,i)Perylene | 400 | U |

(1) - Cannot be separated from Diphenylamine

1B

# SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0019-0001

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: S53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-004

Sample wt/vol: 30.2 (g/mL) G Lab File ID: A1084

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 18 dec. Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N pH: 7.5 Dilution Factor: 1.00

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 108-95-2 | Phenol | 400 | U |
| 111-44-4 | bis(2-Chloroethyl)Ether | 400 | U |
| 95-57-8 | 2-Chlorophenol | 400 | U |
| 541-73-1 | 1,3-Dichlorobenzene | 400 | U |
| 106-46-7 | 1,4-Dichlorobenzene | 400 | U |
| 100-51-6 | Benzyl Alcohol | 400 | U |
| 95-50-1 | 1,2-Dichlorobenzene | 400 | U |
| 95-48-7 | 2-Methylphenol | 400 | U |
| 39638-32-9 | bis(2-Chloroisopropyl)Ether | 400 | U |
| 106-44-5 | 4-Methylphenol | 400 | U |
| 621-64-7 | N-Nitroso-Di-n-Propylamine | 400 | U |
| 67-72-1 | Hexachloroethane | 400 | U |
| 98-95-3 | Nitrobenzene | 400 | U |
| 78-59-1 | Isophorone | 400 | U |
| 88-75-5 | 2-Nitrophenol | 400 | U |
| 105-67-9 | 2,4-Dimethylphenol | 400 | U |
| 65-85-0 | Benzoic Acid | 1900 | U |
| 111-91-1 | bis(2-Chloroethoxy)Methane | 400 | U |
| 120-83-2 | 2,4-Dichlorophenol | 400 | U |
| 120-82-1 | 1,2,4-Trichlorobenzene | 400 | U |
| 91-20-3 | Naphthalene | 400 | U |
| 106-47-8 | 4-Chloroaniline | 400 | U |
| 87-68-3 | Hexachlorobutadiene | 400 | U |
| 59-50-7 | 4-Chloro-3-Methylphenol | 400 | U |
| 91-57-6 | 2-Methylnaphthalene | 400 | U |
| 77-47-4 | Hexachlorocyclopentadiene | 400 | U |
| 88-06-2 | 2,4,6-Trichlorophenol | 400 | U |
| 95-95-4 | 2,4,5-Trichlorophenol | 1900 | U |
| 91-58-7 | 2-Chloronaphthalene | 400 | U |
| 88-74-4 | 2-Nitroaniline | 1900 | U |
| 131-11-3 | Dimethyl Phthalate | 400 | U |
| 208-96-8 | Acenaphthylene | 400 | U |
| 606-20-2 | 2,6-Dinitrotoluene | 400 | U |

1B

# SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0019-1001

000045

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: S53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: 1530-005

Sample wt/vol: 30.1 (g/mL) G Lab File ID: A1085

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 22 dec. Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N pH: 7.4 Dilution Factor: 1.0

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 108-95-2 | Phenol | 420 | U |
| 111-44-4 | bis(2-Chloroethyl)Ether | 420 | U |
| 95-57-8 | 2-Chlorophenol | 420 | U |
| 541-73-1 | 1,3-Dichlorobenzene | 420 | U |
| 106-46-7 | 1,4-Dichlorobenzene | 420 | U |
| 100-51-6 | Benzyl Alcohol | 420 | U |
| 95-50-1 | 1,2-Dichlorobenzene | 420 | U |
| 95-48-7 | 2-Methylphenol | 420 | U |
| 39638-32-9 | bis(2-Chloroisopropyl)Ether | 420 | U |
| 106-44-5 | 4-Methylphenol | 420 | U |
| 621-64-7 | N-Nitroso-Di-n-Propylamine | 420 | U |
| 67-72-1 | Hexachloroethane | 420 | U |
| 98-95-3 | Nitrobenzene | 420 | U |
| 78-59-1 | Isophorone | 420 | U |
| 88-75-5 | 2-Nitrophenol | 420 | U |
| 105-67-9 | 2,4-Dimethylphenol | 420 | U |
| 65-85-0 | Benzoic Acid | 2000 | U |
| 111-91-1 | bis(2-Chloroethoxy)Methane | 420 | U |
| 120-83-2 | 2,4-Dichlorophenol | 420 | U |
| 120-82-1 | 1,2,4-Trichlorobenzene | 420 | U |
| 91-20-3 | Naphthalene | 420 | U |
| 106-47-8 | 4-Chloroaniline | 420 | U |
| 87-68-3 | Hexachlorobutadiene | 420 | U |
| 59-50-7 | 4-Chloro-3-Methylphenol | 420 | U |
| 91-57-6 | 2-Methylnaphthalene | 420 | U |
| 77-47-4 | Hexachlorocyclopentadiene | 420 | U |
| 88-06-2 | 2,4,6-Trichlorophenol | 420 | U |
| 95-95-4 | 2,4,5-Trichlorophenol | 2000 | U |
| 91-58-7 | 2-Chloronaphthalene | 420 | U |
| 88-74-4 | 2-Nitroaniline | 2000 | U |
| 131-11-3 | Dimethyl Phthalate | 420 | U |
| 208-96-8 | Acenaphthylene | 420 | U |
| 606-20-2 | 2,6-Dinitrotoluene | 420 | U |

1C

# SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

0000458

0019-1001

Lab Name: ITAS-ST.LOUIS  Contract: G0626-0U3-0001

Lab Code: ITSL  Case No.: S53001  SAS No.:  SDG No.: 0016-0001

Matrix: (soil/water) SOIL  Lab Sample ID: 1530-005

Sample wt/vol: 30.1 (g/mL) G  Lab File ID: A1085

Level: (low/med) LOW  Date Received: 08/29/91

% Moisture: not dec. 22 dec.  Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC  Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N  pH: 7.4  Dilution Factor: 1.0

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 99-09-2 | 3-Nitroaniline | 2000 | U |
| 83-32-9 | Acenaphthene | 420 | U |
| 51-28-5 | 2,4-Dinitrophenol | 2000 | U |
| 100-02-7 | 4-Nitrophenol | 2000 | U |
| 132-64-9 | Dibenzofuran | 420 | U |
| 121-14-2 | 2,4-Dinitrotoluene | 420 | U |
| 84-66-2 | Diethylphthalate | 260 | BJ |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 420 | U |
| 86-73-7 | Fluorene | 420 | U |
| 100-10-6 | 4-Nitroaniline | 2000 | U |
| 534-52-1 | 4,6-Dinitro-2-Methylphenol | 2000 | U |
| 86-30-6 | N-Nitrosodiphenylamine (1) | 420 | U |
| 101-55-3 | 4-Bromophenyl-phenylether | 420 | U |
| 118-74-1 | Hexachlorobenzene | 420 | U |
| 87-86-5 | Pentachlorophenol | 2000 | U |
| 85-01-8 | Phenanthrene | 420 | U |
| 120-12-7 | Anthracene | 420 | U |
| 84-74-2 | Di-n-Butylphthalate | 420 | U |
| 206-44-0 | [illegible]thene | 69 | J |
| 129-00-0 | [illegible] | 44 | J |
| 85-68-7 | Butylbenzylphthalate | 420 | U |
| 91-94-1 | 3,3'-Dichlorobenzidine | 840 | U |
| 56-55-3 | Benzo(a)Anthracene | 420 | U |
| 218-01-9 | Chrysene | 420 | U |
| 117-81-7 | bis(2-Ethylhexyl)Phthalate | 420 | U |
| 117-84-0 | Di-n-Octyl Phthalate | 420 | U |
| 205-99-2 | Benzo(b)Fluoranthene | 420 | U |
| 207-08-9 | Benzo(k)Fluoranthene | 420 | U |
| 50-32-8 | Benzo(a)Pyrene | 420 | U |
| 193-39-5 | Indeno(1,2,3-cd)Pyrene | 420 | U |
| 53-70-3 | Dibenz(a,h)Anthracene | 420 | U |
| 191-24-2 | Benzo(g,h,i)Perylene | 420 | U |

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

0019-1001

000045

Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL Case No.:S53001 SAS No.: SDG No.:0016-0001

Matrix: (soil/water)SOIL Lab Sample ID: 1530-005

Sample wt/vol: 30.1 (g/mL)G Lab File ID: A1085

Level: (low/med) LOW Date Received: 08/29/91

% Moisture: not dec. 22 dec. Date Extracted:09/06/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/13/91

GPC Cleanup: (Y/N)N pH: 7.4 Dilution Factor:1.0

Number TICs found: 16

CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. 0 | Aldol Condensation. | 4.56 | 52000 | BJA |
| 2. 0 | UNKNOWN | 5.62 | 860 | BJ |
| 3. 0 | UNKNOWN | 12.90 | 210 | BJ |
| 4. 0 | UNKNOWN | 13.19 | 240 | BJ |
| 5. | UNKNOWN | 15.06 | 280 | J |
| 6. 0 | UNKNOWN | 16.17 | 220 | BJ |
| 7. 57103 | Hexadecanoic acid (9CI) | 20.26 | 830 | BJ |
| 18. | UNKNOWN | 21.28 | 220 | J |
| 19. 10544500 | Sulfur, mol. (S8) (8CI9CI) | 21.48 | 1800 | J |
| 10. 0 | Hydrocarbon | 25.18 | 1100 | BJ |
| 11. | Hydrocarbon | 26.81 | 430 | J |
| 12. | Hydrocarbon | 28.32 | 760 | J |
| 13. | UNKNOWN | 29.72 | 330 | J |
| 14. | Hydrocarbon | 29.77 | 570 | J |
| 15. | [illegible] | 31.42 | 210 | J |
| 16. | [illegible] | 32.10 | 380 | J |

1D
# PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.: MND33-0016-0001

Lab Name: ITAS-St. Louis Contract: 60626-043-001

Lab Code: ITSL Case No.: NA SAS No.: SDG No.: 0016-009

Matrix: (soil/water) Soil Lab Sample ID: 1530-001

Sample wt/vol: 30.0 (g/mL) g Lab File ID: NA

Level: (low/med) low Date Collected: 08-28-91

% Moisture: not dec. 21 dec. NA Date Extracted: 09-09-91

Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91

GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg | Q |
|---|---|---|---|
| 319-84-6 | alpha-BHC | 2.5 | U |
| 319-85-7 | beta-BHC | 5.1 | U |
| 319-86-8 | delta-BHC | 14 | X |
| 58-89-9 | gamma-BHC (Lindane) | 3.4 | U |
| 76-44-8 | Heptachlor | 3.5 | U |
| 309-00-2 | Aldrin | 3.4 | U |
| 1024-57-3 | Heptachlor epoxide | 30 | U |
| 959-98-8 | Endosulfan I | 12 | U |
| 60-57-1 | Dieldrin | 1.6 | U |
| 72-55-9 | 4,4'-DDE | 3.4 | U |
| 72-20-8 | Endrin | 5.1 | U |
| 33213-65-9 | Endosulfan II | 3.4 | U |
| 72-54-8 | 4,4'-DDD | 9.4 | U |
| 1031-07-8 | Endosulfan sulfate | 56 | U |
| 50-29-3 | 4,4'-DDT | 10 | U |
| 72-43-5 | Methoxychlor | 150 | U |
| 53494-70-5 | Endrin ketone | 20 | U |
| 5103-71-9 | alpha-Chlordane | 12 | U |
| 5103-74-2 | gamma-Chlordane | 12 | U |
| 8001-35-2 | Toxaphene | 200 | U |
| 12674-11-2 | Aroclor-1016 | 100 | U |
| 11104-28-2 | Aroclor-1221 | 100 | U |
| 11141-16-5 | Aroclor-1232 | 100 | U |
| 53469-21-9 | Aroclor-1242 | 100 | U |
| 12672-29-6 | Aroclor-1248 | 100 | U |
| 11097-69-1 | Aroclor-1254 | 200 | U |
| 11096-82-5 | Aroclor-1260 | 200 | U |
| 7421-93-4 | Endrin Aldehyde | 20 | U |

X: Quantitation performed from secondary column.
Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

1D
# PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
MND33-0017-0001

Lab Name: ITAS-St. Louis Contract: 60626-043-0001

Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-001

Matrix: (soil/water) Soil Lab Sample ID: 1530-002

Sample wt/vol: 30.0 (g/mL) g Lab File ID: _____

Level: (low/med) low Date Collected: 08-28-91

% Moisture: not dec. 27 dec. NA Date Extracted: 09-09-91

Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91

GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg | Q |
|---|---|---|---|
| 319-84-6 | alpha-BHC | 2.7 | U |
| 319-85-7 | beta-BHC | 5.5 | U |
| 319-86-8 | delta-BHC | 5.2 | U |
| 58-89-9 | gamma-BHC (Lindane) | 3.7 | U |
| 76-44-8 | Heptachlor | 2.7 | U |
| 309-00-2 | Aldrin | 3.7 | U |
| 1024-57-3 | Heptachlor epoxide | 76 | U |
| 959-98-8 | Endosulfan I | 13 | U |
| 60-57-1 | Dieldrin | 1.8 | U |
| 72-55-9 | 4,4'-DDE | 3.7 | U |
| 72-20-8 | Endrin | 5.5 | U |
| 33213-65-9 | Endosulfan II | 3.7 | U |
| 72-54-8 | 4,4'-DDD | 10 | U |
| 1031-07-8 | Endosulfan sulfate | 60 | U |
| 50-29-3 | 4,4'-DDT | 11 | U |
| 72-43-5 | Methoxychlor | 160 | U |
| 53494-70-5 | Endrin ketone | 22 | U |
| 5103-71-9 | alpha-Chlordane | 13 | U |
| 5103-74-2 | gamma-Chlordane | 13 | U |
| 8001-35-2 | Toxaphene | 220 | U |
| 12674-11-2 | Aroclor-1016 | 110 | U |
| 11104-28-2 | Aroclor-1221 | 110 | U |
| 11141-16-5 | Aroclor-1232 | 110 | U |
| 53469-21-9 | Aroclor-1242 | 110 | U |
| 12672-29-6 | Aroclor-1248 | 110 | U |
| 11097-69-1 | Aroclor-1254 | 220 | U |
| 11096-82-5 | Aroclor-1260 | 220 | U |
| 7421-93-4 | Endrin Aldehyde | 21 | U |

X: Quantitation performed from secondary column.
Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 0000748

MND33-0018-0001

Lab Name: ITAS-St. Louis Contract: G0626-043-0001

Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001

Matrix: (soil/water) Soil Lab Sample ID: 1530-003

Sample wt/vol: 30.1 (g/mL) g Lab File ID: NA

Level: (low/med) low Date Collected: 08-28-91

% Moisture: not dec. 22 dec. NA Date Extracted: 09-09-91

Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91

GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg | Q |
|---|---|---|---|
| 319-84-6 | alpha-BHC | 2.6 | U |
| 319-85-7 | beta-BHC | 5.1 | U |
| 319-86-8 | delta-BHC | 7.7 | U |
| 58-89-9 | gamma-BHC (Lindane) | 3.5 | U |
| 76-44-8 | Heptachlor | 2.6 | U |
| 309-00-2 | Aldrin | 3.5 | U |
| 1024-57-3 | Heptachlor epoxide | 71 | U |
| 959-98-8 | Endosulfan I | 12 | U |
| 60-57-1 | Dieldrin | 1.7 | U |
| 72-55-9 | 4,4'-DDE | 3.5 | U |
| 72-20-8 | Endrin | 5.1 | U |
| 33213-65-9 | Endosulfan II | 3.5 | U |
| 72-54-8 | 4,4'-DDD | 9.5 | U |
| 1031-07-8 | Endosulfan sulfate | 57 | U |
| 50-29-3 | 4,4'-DDT | 10 | U |
| 72-43-5 | Methoxychlor | 160 | U |
| 53494-70-5 | Endrin ketone | 21 | U |
| 5103-71-9 | alpha-Chlordane | 12 | U |
| 5103-74-2 | gamma-Chlordane | 12 | U |
| 8001-35-2 | Toxaphene | 210 | U |
| 12674-11-2 | Aroclor-1016 | 100 | U |
| 11104-28-2 | Aroclor-1221 | 100 | U |
| 11141-16-5 | Aroclor-1232 | 100 | U |
| 53469-21-9 | Aroclor-1242 | 100 | U |
| 12672-29-6 | Aroclor-1248 | 100 | U |
| 11097-69-1 | Aroclor-1254 | 200 | U |
| 11096-82-5 | Aroclor-1260 | 200 | U |
| 7421-93-4 | Endrin Aldehyde | 20 | U |

X: Quantitation performed from secondary column.
Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

FORM I PEST

1D
# PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MN033-0019-0001

Lab Name: ITAS-St. Louis Contract: 80626-043-0001

Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001

Matrix: (soil/water) Soil Lab Sample ID: 1530-004

Sample wt/vol: 30.0 (g/mL) g Lab File ID: NA

Level: (low/med) low Date Collected: 08-28-91

% Moisture: not dec. 18 dec. NA Date Extracted: 09-09-91

Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91

GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg | Q |
|---|---|---|---|
| 319-84-6 | alpha-BHC | 2.4 | U |
| 319-85-7 | beta-BHC | 4.9 | UY |
| 319-86-8 | delta-BHC | 7.3 | UY |
| 58-89-9 | gamma-BHC (Lindane) | 3.3 | U |
| 76-44-8 | Heptachlor | 2.4 | U |
| 309-00-2 | Aldrin | 3.3 | U |
| 1024-57-3 | Heptachlor epoxide | 68 | U |
| 959-98-8 | Endosulfan I | 11 | U |
| 60-57-1 | Dieldrin | 1.6 | U |
| 72-55-9 | 4,4'-DDE | 3.3 | U |
| 72-20-8 | Endrin | 4.9 | U |
| 33213-65-9 | Endosulfan II | 3.3 | U |
| 72-54-8 | 4,4'-DDD | 9.0 | U |
| 1031-07-8 | Endosulfan sulfate | 54 | U |
| 50-29-3 | 4,4'-DDT | 9.7 | U |
| 72-43-5 | Methoxychlor | 140 | U |
| 53494-70-5 | Endrin ketone | 20 | U |
| 5103-71-9 | alpha-Chlordane | 11 | U |
| 5103-74-2 | gamma-Chlordane | 11 | U |
| 8001-35-2 | Toxaphene | 300 | U |
| 12674-11-2 | Aroclor-1016 | 97 | U |
| 11104-28-2 | Aroclor-1221 | 97 | U |
| 11141-16-5 | Aroclor-1232 | 97 | U |
| 53469-21-9 | Aroclor-1242 | 97 | U |
| 12672-29-6 | Aroclor-1248 | 97 | U |
| 11097-69-1 | Aroclor-1254 | 140 | U |
| 11096-82-5 | Aroclor-1260 | 140 | U |
| 7421-93-4 | Endrin Aldehyde | 19 | U |

X: Quantitation performed from secondary column.
Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

1D
# PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

MWD33-0019-1001

Lab Name: ITAS-St. Louis Contract: 60626-0113-00D1

Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001

Matrix: (soil/water) Soil Lab Sample ID: 1530-005

Sample wt/vol: 30.0 (g/mL) g Lab File ID: NA

Level: (low/med) low Date Collected: 08-28-91

% Moisture: not dec. 22 dec. NA Date Extracted: 09-09-91

Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91

GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) ug/kg | Q |
|---|---|---|---|
| 319-84-6 | alpha-BHC | 2.6 | u |
| 319-85-7 | beta-BHC | 5.1 | uY |
| 319-86-8 | delta-BHC | 8.6 | uZ |
| 58-89-9 | gamma-BHC (Lindane) | 3.4 | u |
| 76-44-8 | Heptachlor | 2.6 | u |
| 309-00-2 | Aldrin | 3.4 | u |
| 1024-57-3 | Heptachlor epoxide | 71 | u |
| 959-98-8 | Endosulfan I | 12 | u |
| 60-57-1 | Dieldrin | 1.7 | u |
| 72-55-9 | 4,4'-DDE | 3.4 | uY |
| 72-20-8 | Endrin | 5.1 | u |
| 33213-65-9 | Endosulfan II | 3.4 | u |
| 72-54-8 | 4,4'-DDD | 9.4 | u |
| 1031-07-8 | Endosulfan sulfate | 56 | u |
| 50-29-3 | 4,4'-DDT | 10 | u |
| 72-43-5 | Methoxychlor | 150 | u |
| 53494-70-5 | Endrin ketone | 20 | u |
| 5103-71-9 | alpha-Chlordane | 12 | u |
| 5103-74-2 | gamma-Chlordane | 12 | u |
| 8001-35-2 | Toxaphene | 200 | u |
| 12674-11-2 | Aroclor-1016 | 100 | u |
| 11104-28-2 | Aroclor-1221 | 100 | u |
| 11141-16-5 | Aroclor-1232 | 100 | u |
| 53469-21-9 | Aroclor-1242 | 100 | u |
| 12672-29-6 | Aroclor-1248 | 100 | u |
| 11097-69-1 | Aroclor-1254 | 200 | u |
| 11096-82-5 | Aroclor-1260 | 200 | u |
| 7421-93-4 | Endrin Aldehyde | 20 | u |

X: Quantitation performed from secondary column.
Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.
Z: Elevated Detection Limit due to a small amount of Aroclor-1248 which interferes with this compound. The Aroclor 1248 concentration is less than the CRDL.

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0000002

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

16-0001

Lab Name: ITAS_ST._LOUIS_____ Contract: G0626/OU30

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-0001

Matrix (soil/water): SOIL_ Lab Sample ID: 1530-001__

Level (low/med): LOW__ Date Received: 08/29/91

% Solids: _78.8

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | 18100 | | | P |
| 7440-36-0 | Antimony_ | 6.1 | B | | P |
| 7440-38-2 | Arsenic__ | 10.5 | | +M | F |
| 7440-39-3 | Barium___ | 72.0 | | | P |
| 7440-41-7 | Beryllium | 0.90 | | N | P |
| 7440-43-9 | Cadmium__ | 0.50 | U | N | P |
| 7440-70-2 | Calcium__ | 53700 | | | P |
| 7440-47-3 | Chromium_ | 18.5 | | | P |
| 7440-48-4 | Cobalt___ | 10.6 | | | P |
| 7440-50-8 | Copper___ | 20.4 | | E | P |
| 7439-89-6 | Iron_____ | 25100 | | E | P |
| 7439-92-1 | Lead_____ | 23.9 | | M* | F |
| 7439-95-4 | Magnesium | 16000 | | | P |
| 7439-96-5 | Manganese | 517 | | | P |
| 7439-97-6 | Mercury__ | 0.06 | U | M | CV |
| 7440-02-0 | Nickel___ | 22.1 | | | P |
| 7440-09-7 | Potassium | 4200 | | | P |
| 7782-49-2 | Selenium_ | 1.7 | | +MN | F |
| 7440-22-4 | Silver___ | 0.62 | B | | P |
| 7440-23-5 | Sodium___ | 309 | B | | P |
| 7440-28-0 | Thallium_ | 0.27 | B | M | F |
| 7440-62-2 | Vanadium_ | 28.4 | | | P |
| 7440-66-6 | Zinc_____ | 74.0 | | | P |
| [illegible] | Cyanide__ | 0.63 | U | M | AS |

Color Before: GREY_____ Clarity Before: OPAQUE Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

PB-10X_DILUTION

AS-5X_DILUTION,_MSA

SE-MSA

CA-25X_DILUTION;_MG-5X_DILUTION

FORM I - IN

3/90

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

17-0001

Lab Name: ITAS_ST._LOUIS_____ Contract: G0626/OU30

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-0001

Matrix (soil/water): SOIL_ Lab Sample ID: 1530-002__

Level (low/med): LOW__ Date Received: 08/29/91

% Solids: _73.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 20000 | | | P |
| 7440-36-0 | Antimony | 5.9 | U | | P |
| 7440-38-2 | Arsenic | 13.3 | | M | F |
| 7440-39-3 | Barium | 70.9 | | | P |
| 7440-41-7 | Beryllium | 0.94 | | N | P |
| 7440-43-9 | Cadmium | 0.52 | U | N | P |
| 7440-70-2 | Calcium | 15300 | B | | P |
| 7440-47-3 | Chromium | 21.8 | | | P |
| 7440-48-4 | Cobalt | 12.8 | | | P |
| 7440-50-8 | Copper | 26.0 | | E | P |
| 7439-89-6 | Iron | 34100 | | E | P |
| 7439-92-1 | Lead | 20.3 | | M* | F |
| 7439-95-4 | Magnesium | 8600 | | | P |
| 7439-96-5 | Manganese | 683 | | | P |
| 7439-97-6 | Mercury | 0.06 | U | M | CV |
| 7440-02-0 | Nickel | 28.2 | | | P |
| 7440-09-7 | Potassium | 4260 | | | P |
| 7782-49-2 | Selenium | 1.9 | | MSN | F |
| 7440-22-4 | Silver | 0.94 | B | | P |
| 7440-23-5 | Sodium | 161 | B | | P |
| 7440-28-0 | Thallium | 0.42 | B | M | F |
| 7440-62-2 | Vanadium | 33.5 | | | P |
| 7440-66-6 | Zinc | 91.6 | | | P |
| | Cyanide | 0.68 | U | M | AS |

Color Before: GREY_____ Clarity Before: OPAQUE Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:
PB-10X_DILUTION
AS-5X_DILUTION
SE-MSA
CA-50X_DILUTION

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

18-0001

Lab Name: ITAS_ST._LOUIS_____ Contract: GO626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-0001

Matrix (soil/water): SOIL_ Lab Sample ID: 1530-003__

Level (low/med): LOW__ Date Received: 08/29/91

% Solids: _77.6

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum_ | 22300 | | | P |
| 7440-36-0 | Antimony_ | 5.7 | U | | P |
| 7440-38-2 | Arsenic__ | 11.3 | | M | F |
| 7440-39-3 | Barium___ | 89.7 | | | P |
| 7440-41-7 | Beryllium | 0.90 | | N | P |
| 7440-43-9 | Cadmium__ | 0.51 | U | N | P |
| 7440-70-2 | Calcium__ | 11300 | B | | P |
| 7440-47-3 | Chromium_ | 23.7 | | | P |
| 7440-48-4 | Cobalt___ | 13.4 | | | P |
| 7440-50-8 | Copper___ | 20.2 | | E | P |
| 7439-89-6 | Iron____ | 33200 | | E | P |
| 7439-92-1 | Lead____ | 20.3 | | M* | F |
| 7439-95-4 | Magnesium | 5560 | | | P |
| 7439-96-5 | Manganese | 1030 | | | P |
| 7439-97-6 | Mercury__ | 0.06 | U | M | CV |
| 7440-02-0 | Nickel___ | 22.0 | | | P |
| 7440-09-7 | Potassium | 4650 | | | P |
| 7782-49-2 | Selenium_ | 1.6 | | +MN | F |
| 7440-22-4 | Silver___ | 0.38 | U | | P |
| 7440-23-5 | Sodium___ | 237 | B | | P |
| 7440-28-0 | Thallium_ | 0.24 | B | M | F |
| 7440-62-2 | Vanadium_ | 38.4 | | | P |
| 7440-66-6 | Zinc____ | 74.0 | | | P |
| | Cyanide__ | 0.64 | U | M | AS |
| | | | | | |

Color Before: GREY_____ Clarity Before: OPAQUE Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

PB-10X_DILUTION

AS-5X_DILUTION

SE-MSA

CA-50X_DILUTION

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

19-0001

Lab Name: ITAS_ST._LOUIS_____ Contract: G0626/OU3000

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-0001

Matrix (soil/water): SOIL_ Lab Sample ID: 1530-004__

Level (low/med): LOW__ Date Received: 08/29/91

% Solids: _82.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 19200 | | | P |
| 7440-36-0 | Antimony | 5.4 | U | | P |
| 7440-38-2 | Arsenic | 7.5 | | M | F |
| 7440-39-3 | Barium | 82.1 | | | P |
| 7440-41-7 | Beryllium | 0.87 | | N | P |
| 7440-43-9 | Cadmium | 0.48 | U | N | P |
| 7440-70-2 | Calcium | 26200 | | | P |
| 7440-47-3 | Chromium | 19.9 | | | P |
| 7440-48-4 | Cobalt | 12.8 | | | P |
| 7440-50-8 | Copper | 28.0 | | E | P |
| 7439-89-6 | Iron | 30000 | | E | P |
| 7439-92-1 | Lead | 19.6 | | M* | F |
| 7439-95-4 | Magnesium | 8940 | | | P |
| 7439-96-5 | Manganese | 867 | | | P |
| 7439-97-6 | Mercury | 0.28 | | M | CV |
| 7440-02-0 | Nickel | 20.3 | | | P |
| 7440-09-7 | Potassium | 4080 | | | P |
| 7782-49-2 | Selenium | 1.4 | | +MN | F |
| 7440-22-4 | Silver | 0.86 | B | | P |
| 7440-23-5 | Sodium | 232 | B | | P |
| 7440-28-0 | Thallium | 0.21 | B | M | F |
| 7440-62-2 | Vanadium | 27.9 | | | P |
| 7440-66-6 | Zinc | 94.0 | | | P |
| [illegible] | Cyanide | 0.61 | U | M | AS |

Color Before: GREY_____ Clarity Before: OPAQUE Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

PB-10X_DILUTION

AS-5X_DILUTION

SE-MSA

CA-20X_DILUTION

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

19-1001

Lab Name: ITAS_ST._LOUIS_____ Contract: GO626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-0001

Matrix (soil/water): SOIL_ Lab Sample ID: 1530-005__

Level (low/med): LOW__ Date Received: 08/29/91

% Solids: _78.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

| CAS No. | Analyte | Concentration | C | Q | M |
|---|---|---|---|---|---|
| 7429-90-5 | Aluminum | 18900 | | | P |
| 7440-36-0 | Antimony | 5.7 | U | | P |
| 7440-38-2 | Arsenic | 8.0 | | M | F |
| 7440-39-3 | Barium | 86.2 | | | P |
| 7440-41-7 | Beryllium | 0.92 | | N | P |
| 7440-43-9 | Cadmium | 0.51 | U | N | P |
| 7440-70-2 | Calcium | 56400 | | | P |
| 7440-47-3 | Chromium | 20.5 | | | P |
| 7440-48-4 | Cobalt | 11.2 | | | P |
| 7440-50-8 | Copper | 38.2 | | E | P |
| 7439-89-6 | Iron | 26500 | | E | P |
| 7439-92-1 | Lead | 21.9 | | M* | F |
| 7439-95-4 | Magnesium | 18000 | | | P |
| 7439-96-5 | Manganese | 483 | | | P |
| 7439-97-6 | Mercury | 0.37 | | M | CV |
| 7440-02-0 | Nickel | 23.0 | | | P |
| 7440-09-7 | Potassium | 4670 | | | P |
| 7782-49-2 | Selenium | 1.7 | | MSN | F |
| 7440-22-4 | Silver | 0.83 | B | | P |
| 7440-23-5 | Sodium | 262 | B | | P |
| 7440-28-0 | Thallium | 0.27 | B | M | F |
| 7440-62-2 | Vanadium | 27.2 | | | P |
| 7440-66-6 | Zinc | 112 | | | P |
| | Cyanide | 0.63 | U | M | AS |

Color Before: GREY_____ Clarity Before: OPAQUE Texture: MEDIUM

Color After: COLORLESS Clarity After: CLEAR_ Artifacts: _____

Comments:

PB-10X_DILUTION

AS-5X_DILUTION

SE-MSA

CA-_20X_DILUTION;_MG-20X_DILUTION

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9

ICP SERIAL DILUTION

EPA SAMPLE NO.

16-0001L

Lab Name: ITAS_ST._LOUIS_____ Contract: G0626/OU3000

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-0

Matrix (soil/water): SOIL_ Level (low/med): LOW__

Concentration Units: ug/L

| Analyte | Initial Sample Result (I) | C | Serial Dilution Result (S) | C | % Difference | Q | M |
|---|---|---|---|---|---|---|---|
| Aluminum | 145286.13 | | 147680.48 | | 1.6 | | P |
| Antimony | 49.26 | B | 225.00 | U | 100.0 | | P |
| Arsenic | 1.00 | U | 281.54 | | | | P |
| Barium | 578.31 | | 620.71 | B | 7.3 | | P |
| Beryllium | 7.23 | | 10.84 | B | 49.9 | | P |
| Cadmium | 4.00 | U | 20.00 | U | | | P |
| Calcium | 17256.28 | | 18008.00 | B | 4.4 | | P |
| Chromium | 148.39 | | 156.03 | | 5.1 | | P |
| Cobalt | 84.94 | | 119.05 | B | 40.2 | | P |
| Copper | 163.72 | | 187.75 | | 14.7 | E | P |
| Iron | 202023.10 | | 223793.64 | | 10.8 | E | P |
| Lead | 162.79 | | 134.12 | | 17.6 | E | P |
| Magnesium | 25782.87 | | 27260.00 | | 5.7 | | P |
| Manganese | 4156.97 | | 4557.32 | | 9.6 | | P |
| Mercury | | | | | | | |
| Nickel | 177.33 | | 147.12 | B | 17.0 | | P |
| Potassium | 33761.88 | | 40672.31 | | 20.5 | | P |
| Selenium | 1.00 | U | 5.00 | U | | | P |
| Silver | 5.00 | B | 15.00 | U | 100.0 | | P |
| Sodium | 2487.29 | B | 2508.42 | B | 0.8 | | P |
| Thallium | 1.00 | U | 430.05 | | | | P |
| Vanadium | 227.87 | | 238.82 | B | 4.8 | | P |
| Zinc | 594.61 | | 653.06 | | 9.8 | | P |

# WATER VOLATILE SURROGATE RECOVERY

Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL Case No.:V53001 SAS No.: SDG No.:0016-0001

| | EPA SAMPLE NO. | S1 (TOL)# | S2 (BFB)# | S3 (DCE)# | OTHER | TOT OUT |
|---|---|---|---|---|---|---|
| 01 | 0016-5001 | 104 | 107 | 106 | 0 | 0 |
| 02 | 0024-5001 | 99 | 109 | 100 | 0 | 0 |
| 03 | VBLK01 | 98 | 107 | 102 | 0 | 0 |

| | | QC LIMITS |
|---|---|---|
| S1 (TOL) | = Toluene-d8 | ( 88-110) |
| S2 (BFB) | = Bromofluorobenzene | ( 86-115) |
| S3 (DCE) | = 1,2-Dichloroethane-d4 | ( 76-114) |

# Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out



FORM II VOA-1 1/87 Rev.

2B
SOIL VOLATILE SURROGATE RECOVERY

Lab Name:ITAS-ST.LOUIS Contract:G0626-OU3-0001

Lab Code:ITSL Case No.:V53001 SAS No.: SDG No.:0016-0001

Level:(low/med)LOW

| | EPA SAMPLE NO. | S1 (TOL)# | S2 (BFB)# | S3 (DCE)# | OTHER | TOT OUT |
|---|---|---|---|---|---|---|
| 01 | 0016-0001 | 104 | 96 | 111 | 0 | 0 |
| 02 | 0017-0001 | 111 | 91 | 113 | 0 | 0 |
| 03 | 0018-0001 | 110 | 90 | 113 | 0 | 0 |
| 04 | 0019-0001 | 112 | 96 | 111 | 0 | 0 |
| 05 | 0019-1001 | 112 | 97 | 105 | 0 | 0 |
| 06 | 0020-0001 | 105 | 96 | 116 | 0 | 0 |
| 07 | 0021-0001 | 107 | 102 | 114 | 0 | 0 |
| 08 | 0022-0001 | 107 | 102 | 116 | 0 | 0 |
| 09 | 0023-0001 | 113 | 108 | 118 | 0 | 0 |
| 10 | 0023-1001 | 105 | 100 | 124 * | 0 | 1 |
| 11 | 0024-0001 | 105 | 106 | 118 | 0 | 0 |
| 12 | 0023-1001MS | 116 | 100 | 124 * | 0 | 1 |
| 13 | 0023-1001MSD | 117 | 107 | 123 * | 0 | 1 |
| 14 | VBLK02 | 98 | 98 | 110 | 0 | 0 |
| 15 | VBLK03 | 101 | 106 | 112 | 0 | 0 |
| 16 | VBLK04 | 96 | 101 | 101 | 0 | 0 |

| | | QC LIMITS |
|---|---|---|
| S1 (TOL) | = Toluene-d8 | ( 81-117) |
| S2 (BFB) | = Bromofluorobenzene | ( 74-121) |
| S3 (DCE) | = 1,2-Dichloroethane-d4 | ( 70-121) |

# Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out



FORM II VOA-2 1/87 Rev.

# SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL Case No.:V53001 SAS No.: SDG No.:0016-0001

Matrix Spike - EPA Sample No.:0023-1001 Level:(low/med)LOW

| COMPOUND | SPIKE ADDED (ug/Kg) | SAMPLE CONCENTRATION (ug/Kg) | MS CONCENTRATION (ug/Kg) | MS % REC # | QC LIMITS REC. |
|---|---|---|---|---|---|
| 1,1-Dichloroethene | 57.8 | 0 | 53.9 | 93 | 59-172 |
| Trichloroethene | 57.8 | 0 | 58.8 | 102 | 62-137 |
| Benzene | 57.8 | 0 | 63.6 | 110 | 66-142 |
| Toluene | 57.8 | 0 | 65.9 | 114 | 59-139 |
| Chlorobenzene | 57.8 | 0 | 66.2 | 114 | 60-133 |

| COMPOUND | SPIKE ADDED (ug/Kg) | MSD CONCENTRATION (ug/Kg) | MSD % REC # | % RPD # | QC LIMITS RPD | QC LIMITS REC. |
|---|---|---|---|---|---|---|
| 1,1-Dichloroethene | 57.8 | 53.3 | 92 | 1 | 22 | 59-172 |
| Trichloroethene | 57.8 | 49.5 | 86 | 17 | 24 | 62-137 |
| Benzene | 57.8 | 55.6 | 96 | 14 | 21 | 66-142 |
| Toluene | 57.8 | 54.6 | 94 | 19 | 21 | 59-139 |
| Chlorobenzene | 57.8 | 52.1 | 90 | 24 * | 21 | 60-133 |

# Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 1 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS:

# VOLATILE METHOD BLANK SUMMARY

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Lab File ID: E2634 Lab Sample ID: QCBLK9994

Date Analyzed: 09/04/91 Time Analyzed: 1019

Matrix: (soil/water) SOIL Level: (low/med) LOW

Instrument ID: MSE

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

| | EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | TIME ANALYZED |
|---|---|---|---|---|
| 01 | 0016-0001 | 1530-001 | E2635 | 1114 |
| 02 | 0017-0001 | 1530-002 | E2636 | 1149 |
| 03 | 0018-0001 | 1530-003 | E2637 | 1225 |
| 04 | 0020-0001 | 1530-006 | E2640 | 1411 |
| 05 | 0023-1001 | 1530-010 | E2644 | 1633 |
| 06 | 0023-1001MS | 1530-010MS | E2645 | 1709 |

COMMENTS:

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

000001

VBLK02

Lab Name: ITAS-ST.LOUIS Contract: 68D20-003-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0015-0001

Matrix: (soil/water) SOIL Lab Sample ID: QCBLK9994

Sample wt/vol: 5.0 (g/mL/G Lab File ID: E2834

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 09/04/91

Column: (pack/cap) CAP Dilution Factor: 1.0

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/kg) UG/KG | Q |
|---|---|---|---|
| 74-87-3 | Chloromethane | 10 | U |
| 74-83-9 | Bromomethane | 10 | U |
| 75-01-4 | Vinyl Chloride | 10 | U |
| 75-00-3 | Chloroethane | 10 | U |
| 75-09-2 | Methylene Chloride | 2 | J |
| 67-64-1 | Acetone | 12 | |
| 75-15-0 | Carbon Disulfide | 5 | U |
| 75-35-4 | 1,1-Dichloroethene | 5 | U |
| 75-34-3 | 1,1-Dichloroethane | 5 | U |
| 540-59-0 | 1,2-Dichloroethene (total) | 5 | U |
| 67-66-3 | Chloroform | 5 | U |
| 107-06-2 | 1,2-Dichloroethane | 5 | U |
| 78-93-3 | 2-Butanone | 10 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 5 | U |
| 56-23-5 | Carbon Tetrachloride | 5 | U |
| 108-05-4 | Vinyl Acetate | 10 | U |
| 75-27-4 | Bromodichloromethane | 5 | U |
| 78-87-5 | 1,2-Dichloropropane | 5 | U |
| 10061-01-5 | cis-1,3-Dichloropropene | 5 | U |
| 79-01-6 | Trichloroethene | 5 | U |
| 124-48-1 | Dibromochloromethane | 5 | U |
| 79-00-5 | 1,1,2-Trichloroethane | 5 | U |
| 71-43-2 | Benzene | 5 | U |
| 10061-02-6 | trans-1,3-Dichloropropene | 5 | U |
| 75-25-2 | Bromoform | 5 | U |
| 108-10-1 | 4-Methyl-2-Pentanone | 10 | U |
| 591-78-6 | 2-Hexanone | 10 | U |
| 127-18-4 | Tetrachloroethene | 5 | U |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 5 | U |
| 108-88-3 | Toluene | 5 | U |
| 108-90-7 | Chlorobenzene | 5 | U |
| 100-41-4 | Ethylbenzene | 5 | U |
| 100-42-5 | Styrene | 5 | U |
| 1330-20-7 | Xylene (total) | 5 | U |

8 1E

# VOLATILE ORGANICS ANALYSIS DATA SHEET
## TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
0000017

VBLK03

Lab Name: ITAS-ST.LOUIS Contract: G0625-003-0001

Lab Code: ISL Case No.: V53001 SAS No.: SDG No.: 0001-001

Matrix: (soil/water) SOIL Lab Sample ID: QCBLK9994

Sample wt/vol: 5.0 (g/mL) G Lab File ID: E2634

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 09/04/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| | | | | |

# VOLATILE METHOD BLANK SUMMARY



Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Lab File ID: F2182 Lab Sample ID: QCBLK999S-1

Date Analyzed: 09/04/91 Time Analyzed: 1245

Matrix: (soil/water) WATER Level: (low/med) LOW

Instrument ID: MSF

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

| | EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | TIME ANALYZED |
|---|---|---|---|---|
| 01 | 0016-5001 | 1530-013 | F2184 | 1442 |
| 02 | 0024-5001 | 1530-012 | F2183 | 1408 |

COMMENTS: QCBLK
MSF;DKN;

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BLANK 00000

Lab Name: ITAS-ST.LOUIS Contract: 68620-003-9001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0015-0001

Matrix: (soil/water) WATER Lab Sample ID: OCBL9997-1

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: FZ182

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 09/04/91

Column: (pack/cap) CAP Dilution Factor: 1.0

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L | Q |
|---|---|---|---|
| 74-87-3 | Chloromethane | 10 | U |
| 74-83-9 | Bromomethane | 10 | U |
| 75-01-4 | Vinyl Chloride | 10 | U |
| 75-00-3 | Chloroethane | 10 | U |
| 75-09-2 | Methylene Chloride | 8 | |
| 67-64-1 | Acetone | 19 | |
| 75-15-0 | Carbon Disulfide | 5 | U |
| 75-35-4 | 1,1-Dichloroethene | 5 | U |
| 75-34-3 | 1,1-Dichloroethane | 5 | U |
| 540-59-0 | 1,2-Dichloroethene (total) | 5 | U |
| 67-66-3 | Chloroform | 5 | U |
| 107-06-2 | 1,2-Dichloroethane | 5 | U |
| 78-93-3 | 2-Butanone | 10 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 5 | U |
| 56-23-5 | Carbon Tetrachloride | 5 | U |
| 108-05-4 | Vinyl Acetate | 10 | U |
| 75-27-4 | Bromodichloromethane | 5 | U |
| 78-87-5 | 1,2-Dichloropropane | 5 | U |
| 10061-01-5 | cis-1,3-Dichloropropene | 5 | U |
| 79-01-6 | Trichloroethene | 5 | U |
| 124-48-1 | Dibromochloromethane | 5 | U |
| 79-00-5 | 1,1,2-Trichloroethane | 5 | U |
| 71-43-2 | Benzene | 5 | U |
| 10061-02-6 | trans-1,3-Dichloropropene | 5 | U |
| 75-25-2 | Bromoform | 5 | U |
| 108-10-1 | 4-Methyl-2-Pentanone | 10 | U |
| 591-78-6 | 2-Hexanone | 10 | U |
| 127-18-4 | Tetrachloroethene | 5 | U |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 5 | U |
| 108-88-3 | Toluene | 5 | U |
| 108-90-7 | Chlorobenzene | 5 | U |
| 100-41-4 | Ethylbenzene | 5 | U |
| 100-42-5 | Styrene | 5 | U |
| 1330-20-7 | Xylene (total) | 5 | U |

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BLK01 0000020

Lab Name: ITAS-ST.LOUIS Contract: G0626-003-9001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) WATER Lab Sample ID: 00BLK9993-1

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: F2132

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 09/04/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| | | | | |

4A

# VOLATILE METHOD BLANK SUMMARY

Lab Name: ITAS-ST.LOUIS Contract: 60626-0U3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Lab File ID: E2649 Lab Sample ID: 0CBLK10022

Date Analyzed: 09/05/91 Time Analyzed: 0934

Matrix: (soil/water) SOIL Level: (low/med) LOW

Instrument ID: MSE

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

| | EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | TIME ANALYZED |
|---|---|---|---|---|
| 01 | 0019-0001 | 1530-004 | E2650 | 1040 |
| 02 | 0021-0001 | 1530-007 | E2651 | 1115 |
| 03 | 0022-0001 | 1530-008 | E2652 | 1151 |
| 04 | 0023-0001 | 1530-009 | E2653 | 1226 |
| 05 | 0024-0001 | 1530-011 | E2655 | 1337 |
| 06 | 0023-1001MSD | 1530-010MSD | E2654 | 1302 |

COMMENTS:

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
000002

VBLK07

Lab Name: ITAS-ST.LOUIS Contract: 60626-0U3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0015-0001

Matrix: (soil/water) SOIL Lab Sample ID: QCBLK10022

Sample wt/vol: 5.0 (g/mL) G Lab File ID: E2549

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 09/05/91

Column: (pack/cap) CAP Dilution Factor: 1.0

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/kg) UG/KG | U |
|---|---|---|---|
| 74-87-3 | Chloromethane | 10 | U |
| 74-83-9 | Bromomethane | 10 | U |
| 75-01-4 | Vinyl Chloride | 10 | U |
| 75-00-3 | Chloroethane | 10 | U |
| 75-09-2 | Methylene Chloride | 2 | J |
| 67-64-1 | Acetone | 14 | |
| 75-15-0 | Carbon Disulfide | 5 | U |
| 75-35-4 | 1,1-Dichloroethene | 5 | U |
| 75-34-3 | 1,1-Dichloroethane | 5 | U |
| 540-59-0 | 1,2-Dichloroethene (total) | 5 | U |
| 67-66-3 | Chloroform | 5 | U |
| 107-06-2 | 1,2-Dichloroethane | 5 | U |
| 78-93-3 | 2-Butanone | 10 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 5 | U |
| 56-23-5 | Carbon Tetrachloride | 5 | U |
| 108-05-4 | Vinyl Acetate | 10 | U |
| 75-27-4 | Bromodichloromethane | 5 | U |
| 78-87-5 | 1,2-Dichloropropane | 5 | U |
| 10061-01-5 | cis-1,3-Dichloropropene | 5 | U |
| 79-01-6 | Trichloroethene | 5 | U |
| 124-48-1 | Dibromochloromethane | 5 | U |
| 79-00-5 | 1,1,2-Trichloroethane | 5 | U |
| 71-43-2 | Benzene | 5 | U |
| 10061-02-6 | trans-1,3-Dichloropropene | 5 | U |
| 75-25-2 | Bromoform | 5 | U |
| 108-10-1 | 4-Methyl-2-Pentanone | 10 | U |
| 591-78-6 | 2-Hexanone | 10 | U |
| 127-18-4 | Tetrachloroethene | 5 | U |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 5 | U |
| 108-88-3 | Toluene | 5 | U |
| 108-90-7 | Chlorobenzene | 5 | U |
| 100-41-4 | Ethylbenzene | 5 | U |
| 100-42-5 | Styrene | 5 | U |
| 1330-20-7 | Xylene (total) | 5 | U |

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
0000023

VBLK07

Lab Name:ITAS-ST.LOUIS Contract:G0626-OU3-0001

Lab Code:ITSL Case No.:V53001 SAS No.: SDG No.:0016-0001

Matrix: (soil/water)SOIL Lab Sample ID: OCBLK1002Z

Sample wt/vol: 5.0 (g/mL)G Lab File ID: E2649

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 09/05/91

Column (pack/cap) CAP Dilution Factor:1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg)UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| | | | | |

4A

# VOLATILE METHOD BLANK SUMMARY

0000024

Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL Case No.:V53001 SAS No.: SDG No.:0016-0001

Lab File ID: E2665 Lab Sample ID:QCBLK10023-1

Date Analyzed: 09/06/91 Time Analyzed: 2007

Matrix: (soil/water)SOIL Level:(low/med) LOW

Instrument ID: MSE

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

| | EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | TIME ANALYZED |
|---|---|---|---|---|
| 01 | 0019-1001 | 1530-005 | E2666 | 2042 |

COMMENTS:



FORM IV VOA 1/87 Rev.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
0000025

VBLK04

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: OCBLK10023-1

Sample wt/vol: 5.0 (g/mL) G Lab File ID: E2665

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 09/06/91

Column: (pack/cap) CAP Dilution Factor: 1.0

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 74-87-3 | Chloromethane | 10 | U |
| 74-83-9 | Bromomethane | 10 | U |
| 75-01-4 | Vinyl Chloride | 10 | U |
| 75-00-3 | Chloroethane | 10 | U |
| 75-09-2 | Methylene Chloride | 2 | J |
| 67-64-1 | Acetone | 19 | |
| 75-15-0 | Carbon Disulfide | 5 | U |
| 75-35-4 | 1,1-Dichloroethene | 5 | U |
| 75-34-3 | 1,1-Dichloroethane | 5 | U |
| 540-59-0 | 1,2-Dichloroethene (total) | 5 | U |
| 67-66-3 | Chloroform | 5 | U |
| 107-06-2 | 1,2-Dichloroethane | 5 | U |
| 78-93-3 | 2-Butanone | 10 | U |
| 71-55-6 | 1,1,1-Trichloroethane | 5 | U |
| 56-23-5 | Carbon Tetrachloride | 5 | U |
| 108-05-4 | Vinyl Acetate | 10 | U |
| 75-27-4 | Bromodichloromethane | 5 | U |
| 78-87-5 | 1,2-Dichloropropane | 5 | U |
| 10061-01-5 | cis-1,3-Dichloropropene | 5 | U |
| 79-01-6 | Trichloroethene | 5 | U |
| 124-48-1 | Dibromochloromethane | 5 | U |
| 79-00-5 | 1,1,2-Trichloroethane | 5 | U |
| 71-43-2 | Benzene | 5 | U |
| 10061-02-6 | trans-1,3-Dichloropropene | 5 | U |
| 75-25-2 | Bromoform | 5 | U |
| 108-10-1 | 4-Methyl-2-Pentanone | 10 | U |
| 591-78-6 | 2-Hexanone | 10 | U |
| 127-18-4 | Tetrachloroethene | 5 | U |
| 79-34-5 | 1,1,2,2-Tetrachloroethane | 5 | U |
| 108-88-3 | Toluene | 5 | U |
| 108-90-7 | Chlorobenzene | 5 | U |
| 100-41-4 | Ethylbenzene | 5 | U |
| 100-42-5 | Styrene | 5 | U |
| 1330-20-7 | Xylene (total) | 5 | U |

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
0000026
VBLK04

Lab Name: ITAS-ST.LOUIS Contract: G062a-OU3-0001

Lab Code: ITSL Case No.: V53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: QCBLK1002C-1

Sample wt/vol: 5.0 (g/mL) G Lab File ID: 52665

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 09/06/91

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| | | | | |

# VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name:ITAS-ST.LOUIS Contract:G0626-OU3-0001

Lab Code:ITSL Case No.:V53001 SAS No.: SDG No.:0016-0001

Lab File ID: EE191 BFB Injection Date:09/03/91

Instrument ID:MSE BFB Injection Time:0954

Matrix:(soil/water)SOIL Level:(low/med)LOW Column:(pack/cap)CAP

| m/e | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE |
|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 21.3 |
| 75 | 30.0 - 60.0% of mass 95 | 45.3 |
| 95 | Base peak, 100% relative abundance | 100.0 |
| 96 | 5.0 - 9.0% of mass 95 | 7.4 |
| 173 | Less than 2.0% of mass 174 | 1.3 ( 1.3)1 |
| 174 | Greater than 50.0% of mass 95 | 97.8 |
| 175 | 5.0 - 9.0% of mass 174 | 7.4 ( 7.6)1 |
| 176 | Greater than 95.0%, but less than 101.0% of mass 174 | 94.7 ( 96.8)1 |
| 177 | 5.0 - 9.0% of mass 176 | 6.9 ( 7.3)2 |

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED | TIME ANALYZED |
|---|---|---|---|---|---|
| 01 | VSTD050 | VSTD050 | E2628 | 09/03/91 | 1706 |
| 02 | VSTD020 | VSTD020 | E2629 | 09/03/91 | 1741 |
| 03 | VSTD100 | VSTD100 | E2630 | 09/03/91 | 1816 |
| 04 | VSTD150 | VSTD150 | E2631 | 09/03/91 | 1852 |
| 05 | VSTD200 | VSTD200 | E2632 | 09/03/91 | 1927 |

5A

# VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: ITAS-ST.LOUIS  Contract: G0626-0U3-0001

Lab Code: ITSL  Case No.: V53001  SAS No.:  SDG No.: 0016-0001

Lab File ID: FF175  BFB Injection Date: 09/03/91

Instrument ID: MSF  BFB Injection Time: 0954

Matrix: (soil/water) WATER  Level: (low/med) LOW  Column: (pack/cap) CAP

| m/e | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE |
|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 25.8 |
| 75 | 30.0 - 60.0% of mass 95 | 53.2 |
| 95 | Base peak, 100% relative abundance | 100.0 |
| 96 | 5.0 - 9.0% of mass 95 | 7.9 |
| 173 | Less than 2.0% of mass 174 | 0.0 ( 0.0)1 |
| 174 | Greater than 50.0% of mass 95 | 60.9 |
| 175 | 5.0 - 9.0% of mass 174 | 5.4 ( 8.8)1 |
| 176 | Greater than 95.0%, but less than 101.0% of mass 174 | 59.0 ( 96.9)1 |
| 177 | 5.0 - 9.0% of mass 176 | 4.0 ( 6.7)2 |

1-Value is % mass 174  2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED | TIME ANALYZED |
|---|---|---|---|---|---|
| 01 | VSTD020 | VSTD020 | F2176 | 09/03/91 | 1646 |
| 02 | VSTD050 | VSTD050 | F2177 | 09/03/91 | 1720 |
| 03 | VSTD100 | VSTD100 | F2178 | 09/03/91 | 1753 |
| 04 | VSTD150 | VSTD150 | F2179 | 09/03/91 | 1827 |
| 05 | VSTD200 | VSTD200 | F2180 | 09/03/91 | 1901 |



FORM V VOA  1/87 Rev.

5A

# VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name:ITAS-ST.LOUIS Contract:G062e-OU3-0001

Lab Code:ITSL Case No.:V53001 SAS No.: SDG No.:001e-0001

Lab File ID: EE192 BFB Injection Date:09/04/91

Instrument ID:MSE BFB Injection Time:0809

Matrix:(soil/water)SOIL Level:(low/med)LOW Column:(pack/cap)CAP

| m/e | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE |
|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 24.7 |
| 75 | 30.0 - 60.0% of mass 95 | 49.0 |
| 95 | Base peak, 100% relative abundance | 100.0 |
| 96 | 5.0 - 9.0% of mass 95 | 6.7 |
| 173 | Less than 2.0% of mass 174 | 1.0 ( 1.1)1 |
| 174 | Greater than 50.0% of mass 95 | 88.5 |
| 175 | 5.0 - 9.0% of mass 174 | 6.4 ( 7.2)1 |
| 176 | Greater than 95.0%, but less than 101.0% of mass 174 | 86.1 ( 97.3)1 |
| 177 | 5.0 - 9.0% of mass 176 | 5.5 ( 6.4)2 |

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED | TIME ANALYZED |
|---|---|---|---|---|---|
| 01 | VSTD050 | VSTD050 | E2633 | 09/04/91 | 0846 |
| 02 | VBLK02 | QCBLK9994 | E2634 | 09/04/91 | 1019 |
| 03 | 0016-0001 | 1530-001 | E2635 | 09/04/91 | 1114 |
| 04 | 0017-0001 | 1530-002 | E2636 | 09/04/91 | 1149 |
| 05 | 0018-0001 | 1530-003 | E2637 | 09/04/91 | 1225 |
| 06 | 0020-0001 | 1530-006 | E2640 | 09/04/91 | 1411 |
| 07 | 0023-1001 | 1530-010 | E2644 | 09/04/91 | 1633 |
| 08 | 0023-1001MS | 1530-010MS | E2645 | 09/04/91 | 1709 |

5A

# VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

0000030

Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL Case No.:V53001 SAS No.: SDG No.:0016-0001

Lab File ID: FF176 BFB Injection Date:09/04/91

Instrument ID:MSF BFB Injection Time:1124

Matrix:(soil/water)WATER Level:(low/med)LOW Column:(pack/cap)CAP

| m/e | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE |
|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 25.5 |
| 75 | 30.0 - 60.0% of mass 95 | 51.3 |
| 95 | Base peak, 100% relative abundance | 100.0 |
| 96 | 5.0 - 9.0% of mass 95 | 6.7 |
| 173 | Less than 2.0% of mass 174 | 0.5 ( 0.8)1 |
| 174 | Greater than 50.0% of mass 95 | 61.3 |
| 175 | 5.0 - 9.0% of mass 174 | 4.5 ( 7.4)1 |
| 176 | Greater than 95.0%, but less than 101.0% of mass 174 | 61.5 (100.4)1 |
| 177 | 5.0 - 9.0% of mass 176 | 4.2 ( 6.8)2 |

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED | TIME ANALYZED |
|---|---|---|---|---|---|
| 01 | VSTD050 | VSTD050 | F2181 | 09/04/91 | 1141 |
| 02 | VBLK01 | QCBLK9993-1 | F2182 | 09/04/91 | 1245 |
| 03 | 0024-5001 | 1530-012 | F2183 | 09/04/91 | 1408 |
| 04 | 0016-5001 | 1530-013 | F2184 | 09/04/91 | 1442 |



FORM V VOA 1/87 Rev.

5A

# VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name:ITAS-ST.LOUIS Contract:60626-0U3-0001

Lab Code:ITSL Case No.:V53001 SAS No.: SDG No.:0016-0001

Lab File ID: EE193 BFB Injection Date:09/05/91

Instrument ID:MSE BFB Injection Time:0755

Matrix:(soil/water)SOIL Level:(low/med)LOW Column:(pack/cap)CAP

| m/e | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE |
|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 26.7 |
| 75 | 30.0 - 60.0% of mass 95 | 55.4 |
| 95 | Base peak, 100% relative abundance | 100.0 |
| 96 | 5.0 - 9.0% of mass 95 | 7.4 |
| 173 | Less than 2.0% of mass 174 | 0.0 ( 0.0)1 |
| 174 | Greater than 50.0% of mass 95 | 85.3 |
| 175 | 5.0 - 9.0% of mass 174 | 6.4 ( 7.5)1 |
| 176 | Greater than 95.0%, but less than 101.0% of mass 174 | 85.1 ( 99.8)1 |
| 177 | 5.0 - 9.0% of mass 176 | 5.4 ( 6.4)2 |

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED | TIME ANALYZED |
|---|---|---|---|---|---|
| 01 | VSTD050 | VSTD050 | E2648 | 09/05/91 | 0820 |
| 02 | VBLK03 | QCBLK10022 | E2649 | 09/05/91 | 0934 |
| 03 | 0019-0001 | 1530-004 | E2650 | 09/05/91 | 1040 |
| 04 | 0021-0001 | 1530-007 | E2651 | 09/05/91 | 1115 |
| 05 | 0022-0001 | 1530-008 | E2652 | 09/05/91 | 1151 |
| 06 | 0023-0001 | 1530-009 | E2653 | 09/05/91 | 1226 |
| 07 | 0023-1001MSD | 1530-010MSD | E2654 | 09/05/91 | 1302 |
| 08 | 0024-0001 | [illegible]-011 | E2655 | 09/05/91 | 1337 |



FORM V VOA 1/87 Rev.

5A

# VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL Case No.:V53001 SAS No.: SDG No.:0016-0001

Lab File ID: EE195 BFB Injection Date:09/06/91

Instrument ID:MSE BFB Injection Time:1801

Matrix:(soil/water)SOIL Level:(low/med)LOW Column:(pack/cap)CAP

| m/e | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE |
|---|---|---|
| 50 | 15.0 - 40.0% of mass 95 | 28.4 |
| 75 | 30.0 - 60.0% of mass 95 | 58.2 |
| 95 | Base peak, 100% relative abundance | 100.0 |
| 96 | 5.0 - 9.0% of mass 95 | 6.6 |
| 173 | Less than 2.0% of mass 174 | 0.0 ( 0.0)1 |
| 174 | Greater than 50.0% of mass 95 | 70.0 |
| 175 | 5.0 - 9.0% of mass 174 | 5.5 ( 7.8)1 |
| 176 | Greater than 95.0%, but less than 101.0% of mass 174 | 68.3 ( 97.6)1 |
| 177 | 5.0 - 9.0% of mass 176 | 4.4 ( 6.5)2 |

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED | TIME ANALYZED |
|---|---|---|---|---|---|
| 01 | VSTD050 | VSTD050 | E2664 | 09/06/91 | 1915 |
| 02 | VBLK04 | QCBLK10023-1 | E2665 | 09/06/91 | 2007 |
| 03 | 0019-1001 | 1530-005 | E2666 | 09/06/91 | 2042 |



FORM V VOA 1/87 Rev.

8A

# VOLATILE INTERNAL STANDARD AREA SUMMARY

0000033

Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL Case No.:V53001 SAS No.: SDG No.:0016-0001

Lab File ID (Standard):E2633 Date Analyzed:09/04/91

Instrument ID:MSE Time Analyzed:0846

Matrix:(soil/water)SOIL Level:(low/med)LOW Column:(pack/cap)CAP

| | | IS1(BCM) AREA # | RT | IS2(DFB) AREA # | RT | IS3(CBZ) AREA # | RT |
|---|---|---|---|---|---|---|---|
| | 12 HOUR STD | 35300 | 11.57 | 117000 | 13.00 | 91800 | 17.06 |
| | UPPER LIMIT | 70600 | | 234000 | | 183600 | |
| | LOWER LIMIT | 17650 | | 58500 | | 45900 | |
| | EPA SAMPLE NO. | | | | | | |
| 01 | 0016-0001 | 28400 | 11.57 | 93700 | 13.00 | 75900 | 17.06 |
| 02 | 0017-0001 | 20000 | 11.54 | 64800 | 12.97 | 47600 | 17.03 |
| 03 | 0018-0001 | 20600 | 11.54 | 64000 | 12.97 | 48900 | 17.03 |
| 04 | 0020-0001 | 21300 | 11.54 | 65900 | 12.97 | 51600 | 17.03 |
| 05 | 0023-1001 | 20200 | 11.57 | 61000 | 12.99 | 46800 | 17.06 |
| 06 | 0023-1001MS | 17200 * | 11.57 | 45800 * | 13.00 | 30800 * | 17.03 |
| 07 | VBLK02 | 32100 | 11.60 | 110000 | 13.00 | 91900 | 17.09 |

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

# Column used to flag internal standard area values with an asterisk



FORM VIII VOA 1/87 Rev.

8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

0000034

Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL Case No.:V53001 SAS No.: SDG No.:0016-0001

Lab File ID (Standard):F2181 Date Analyzed:09/04/91

Instrument ID:MSF Time Analyzed:1141

Matrix:(soil/water)WATER Level:(low/med)LOW Column:(pack/cap)CAP

| | | IS1(BCM) AREA # | RT | IS2(DFB) AREA # | RT | IS3(CBZ) AREA # | RT |
|---|---|---|---|---|---|---|---|
| | 12 HOUR STD | 35500 | 10.30 | 133000 | 12.45 | 108000 | 17.53 |
| | UPPER LIMIT | 71000 | | 266000 | | 216000 | |
| | LOWER LIMIT | 17750 | | 66500 | | 54000 | |
| | EPA SAMPLE NO. | | | | | | |
| 01 | 0016-5001 | 34300 | 10.38 | 129000 | 12.52 | 108000 | 17.55 |
| 02 | 0024-5001 | 31300 | 10.32 | 113000 | 12.46 | 99900 | 17.54 |
| 03 | VBLK01 | 31000 | 10.28 | 118000 | 12.44 | 104000 | 17.52 |

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

# Column used to flag internal standard area values with an asterisk



FORM VIII VOA 1/87 Rev.

8A

VOLATILE INTERNAL STANDARD AREA SUMMARY

0000035

Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL - Case No.:V53001 SAS No.: SDG No.:0016-0001

Lab File ID (Standard):E2648 Date Analyzed:09/05/91

Instrument ID:MSE Time Analyzed:0820

Matrix:(soil/water)SOIL Level:(low/med)LOW Column:(pack/cap)CAP

| | | IS1(BCM) AREA # | RT | IS2(DFB) AREA # | RT | IS3(CBZ) AREA # | RT |
|---|---|---|---|---|---|---|---|
| | 12 HOUR STD | 28300 | 11.58 | 89700 | 13.01 | 72000 | 17.07 |
| | UPPER LIMIT | 56600 | | 179400 | | 144000 | |
| | LOWER LIMIT | 14150 | | 44850 | | 36000 | |
| | EPA SAMPLE NO. | | | | | | |
| 01 | 0019-0001 | 19200 | 11.60 | 58600 | 13.03 | 43000 | 17.06 |
| 02 | 0021-0001 | 17600 | 11.57 | 55000 | 13.00 | 41900 | 17.06 |
| 03 | 0022-0001 | 19100 | 11.55 | 60000 | 12.98 | 45800 | 17.04 |
| 04 | 0023-0001 | 16700 | 11.57 | 50800 | 13.00 | 37900 | 17.03 |
| 05 | 0024-0001 | 19300 | 11.55 | 62500 | 12.98 | 51300 | 17.04 |
| 06 | 0023-1001MSD | 16500 | 11.56 | 49800 | 12.99 | 35900 * | 17.05 |
| 07 | VBLK03 | 24500 | 11.60 | 82500 | 13.03 | 69100 | 17.09 |

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

# Column used to flag internal standard area values with an asterisk



FORM VIII VOA 1/87 Rev.

8A
VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL - Case No.:V53001 SAS No.: SDG No.:0016-0001

Lab File ID (Standard):E2664 Date Analyzed:09/06/91

Instrument ID:MSE Time Analyzed:1915

Matrix:(soil/water)SOIL Level:(low/med)LOW Column:(pack/cap)CAP

| | | IS1(BCM) AREA # | RT | IS2(DFB) AREA # | RT | IS3(CBZ) AREA # | RT |
|---|---|---|---|---|---|---|---|
| | 12 HOUR STD | 24700 | 11.63 | 79700 | 13.06 | 64900 | 17.12 |
| | UPPER LIMIT | 49400 | | 159400 | | 129800 | |
| | LOWER LIMIT | 12350 | | 39850 | | 32450 | |
| | EPA SAMPLE NO. | | | | | | |
| 01 | 0019-1001 | 16300 | 11.59 | 50600 | 13.02 | 38200 | 17.08 |
| 02 | VBLK04 | 22700 | 11.60 | 73500 | 13.02 | 64400 | 17.08 |

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

# Column used to flag internal standard area values with an asterisk



FORM VIII VOA 1/87 Rev.

2D

# SOIL SEMIVOLATILE SURROGATE RECOVERY

0000318

Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL Case No.:S53001 SAS No.: SDG No.:0016-0001

Level:(low/med)LOW

| | EPA SAMPLE NO. | S1 (NBZ)# | S2 (FBP)# | S3 (TPH)# | S4 (PHL)# | S5 (2FP)# | S6 (TBP)# | OTHER | TOT OUT |
|---|---|---|---|---|---|---|---|---|---|
| 01 | 0016-0001 | 68 | 72 | 71 | 68 | 56 | 69 | 0 | 0 |
| 02 | 0017-0001 | 68 | 75 | 70 | 70 | 58 | 73 | 0 | 0 |
| 03 | 0018-0001 | 66 | 68 | 68 | 65 | 52 | 72 | 0 | 0 |
| 04 | 0019-0001 | 66 | 69 | 68 | 64 | 50 | 77 | 0 | 0 |
| 05 | 0019-1001 | 71 | 69 | 60 | 66 | 49 | 85 | 0 | 0 |
| 06 | 0020-0001 | 66 | 68 | 62 | 65 | 51 | 76 | 0 | 0 |
| 07 | 0021-0001 | 69 | 70 | 66 | 67 | 52 | 81 | 0 | 0 |
| 08 | 0022-0001 | 67 | 70 | 65 | 66 | 50 | 81 | 0 | 0 |
| 09 | 0023-0001 | 73 | 70 | 71 | 74 | 59 | 72 | 0 | 0 |
| 10 | 0023-1001 | 70 | 67 | 74 | 68 | 55 | 69 | 0 | 0 |
| 11 | 0024-0001 | 67 | 65 | 65 | 68 | 53 | 69 | 0 | 0 |
| 12 | 0023-1001MS | 64 | 64 | 62 | 64 | 53 | 69 | 0 | 0 |
| 13 | 0023-1001MSD | 70 | 71 | 69 | 73 | 58 | 73 | 0 | 0 |
| 14 | SBLK01 | 86 | 74 | 70 | 86 | 69 | 84 | 0 | 0 |

| | | QC LIMITS |
|---|---|---|
| S1 (NBZ) | = Nitrobenzene-d5 | ( 23-120) |
| S2 (FBP) | = 2-Fluorobiphenyl | ( 30-115) |
| S3 (TPH) | = Terphenyl | ( 18-137) |
| S4 (PHL) | = Phenol-d5 | ( 24-113) |
| S5 (2FP) | = 2-Fluorophenol | ( 25-121) |
| S6 (TBP) | = 2,4,6-Tribromophenol | ( 19-122) |

# Column to be used to flag recovery values
* Values outside of contract required QC limits
D Surrogates diluted out



FORM II SV-2 1/87 Rev.

# SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name:ITAS-ST.LOUIS Contract:G0626-OU3-0001

Lab Code:ITSL Case No.:S53001 SAS No.: SDG No.:0016-0001

Matrix Spike - EPA Sample No.:0023-1001 Level:(low/med)LOW

| COMPOUND | SPIKE ADDED (ug/Kg) | SAMPLE CONCENTRATION (ug/Kg) | MS CONCENTRATION (ug/Kg) | MS % REC # | QC LIMITS REC. |
|---|---|---|---|---|---|
| Phenol | 7700 | 0 | 4700 | 61 | 26- 90 |
| 2-Chlorophenol | 7700 | 0 | 4620 | 60 | 25-102 |
| 1,4-Dichlorobenzene | 3850 | 0 | 2220 | 58 | 28 104 |
| N-Nitroso-di-n-prop.(1) | 3850 | 0 | 2590 | 67 | 41 126 |
| 1,2,4-Trichlorobenzene | 3850 | 0 | 2440 | 63 | 38 107 |
| 4-Chloro-3-methylphenol | 7700 | 0 | 5470 | 71 | 26 103 |
| Acenaphthene | 3850 | 0 | 2320 | 60 | 31-137 |
| 4-Nitrophenol | 7700 | 0 | 5160 | 67 | 11-114 |
| 2,4-Dinitrotoluene | 3850 | 0 | 2360 | 61 | 28- 89 |
| Pentachlorophenol | 7700 | 0 | 5430 | 70 | 17-109 |
| Pyrene | 3850 | 0 | 2410 | 62 | 35-142 |

| COMPOUND | SPIKE ADDED (ug/Kg) | MSD CONCENTRATION (ug/Kg) | MSD % REC # | % RPD # | QC LIMITS RPD | QC LIMITS REC. |
|---|---|---|---|---|---|---|
| Phenol | 7680 | 5220 | 68 | -11 | 35 | 26- 90 |
| 2-Chlorophenol | 7680 | 5220 | 68 | -12 | 50 | 25-102 |
| 1,4-Dichlorobenzene | 3840 | 2510 | 65 | -11 | 27 | 28 104 |
| N-Nitroso-di-n-prop.(1) | 3840 | 2920 | 76 | -13 | 38 | 41 126 |
| 1,2,4-Trichlorobenzene | 3840 | 2710 | 71 | -12 | 23 | 38 107 |
| 4-Chloro-3-methylphenol | 7680 | 5950 | 77 | -8 | 33 | 26 103 |
| Acenaphthene | 3840 | 2530 | 66 | -10 | 19 | 31-137 |
| 4-Nitrophenol | 7680 | 5570 | 72 | -9 | 50 | 11-114 |
| 2,4-Dinitrotoluene | 3840 | 2520 | 66 | -8 | 47 | 28- 89 |
| Pentachlorophenol | [illegible]680 | 6260 | 81 | -14 | 47 | 17-109 |
| Pyrene | [illegible]40 | 2700 | 70 | -11 | 36 | 35-142 |

(1) N-Nitroso-di-n-propylamine

# Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 11 outside limits
Spike Recovery: 0 out of 22 outside limits

COMMENTS: 1530-010
IN#MSA;251.02;SOIL;J

# SEMIVOLATILE METHOD BLANK SUMMARY

Lab Name: ITAS-ST.LOUIS Contract: G0626-0U3-0001

Lab Code: ITSL Case No.: S53001 SAS No.: SDG No.: 0016-0001

Lab File ID: A1080 Lab Sample ID: QCBLK10004-1

Date Extracted: 09/06/91 Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 09/13/91 Time Analyzed: 1519

Matrix: (soil/water) SOIL Level: (low/med) LOW

Instrument ID: MSA

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

| | EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED |
|---|---|---|---|---|
| 01 | 0016-0001 | 1530-001 | A1081 | 09/13/91 |
| 02 | 0017-0001 | 1530-002 | A1082 | 09/13/91 |
| 03 | 0018-0001 | 1530-003 | A1083 | 09/13/91 |
| 04 | 0019-0001 | 1530-004 | A1084 | 09/13/91 |
| 05 | 0019-1001 | 1530-005 | A1085 | 09/13/91 |
| 06 | 0020-0001 | 1530-006 | A1086 | 09/13/91 |
| 07 | 0021-0001 | 1530-007 | A1087 | 09/13/91 |
| 08 | 0022-0001 | 1530-008 | A1088 | 09/13/91 |
| 09 | 0023-0001 | 1530-009 | A1090 | 09/15/91 |
| 10 | 0023-1001 | 1530-010 | A1091 | 09/15/91 |
| 11 | 0024-0001 | 1530-011 | A1094 | 09/15/91 |
| 12 | 0023-1001MS | 1530-010MS | A1092 | 09/15/91 |
| 13 | 0023-1001MSD | 1530-010MSD | A1093 | 09/15/91 |

COMMENTS: BLK 10004
IN#MSA;251.02;SOIL;J



FORM IV SV 1/87 Rev.

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

S-H SAMPLE NO.

SBLK01 0000321

Lab Name: IAS-ST.LOUIS Contract: 60626-0U3-0001

Lab Code: ISL Case No.: S53001 SAS No.: SDG No.: 0015-0001

Matrix: (soil/water) SOIL Lab Sample ID: OCBLK10004-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1080

Level: (low/med) LOW Date Received:

% Moisture: not dec. dec. Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 108-95-2 | Phenol | 330 | U |
| 111-44-4 | bis(2-Chloroethyl)Ether | 330 | U |
| 95-57-8 | 2-Chlorophenol | 330 | U |
| 541-73-1 | 1,3-Dichlorobenzene | 330 | U |
| 106-46-7 | 1,4-Dichlorobenzene | 330 | U |
| 100-51-6 | Benzyl Alcohol | 330 | U |
| 95-50-1 | 1,2-Dichlorobenzene | 330 | U |
| 95-48-7 | 2-Methylphenol | 330 | U |
| 39638-32-9 | bis(2-Chloroisopropyl)Ether | 330 | U |
| 106-44-5 | 4-Methylphenol | 330 | U |
| 621-64-7 | N-Nitroso-Di-n-Propylamine | 330 | U |
| 67-72-1 | Hexachloroethane | 330 | U |
| 98-95-3 | Nitrobenzene | 330 | U |
| 78-59-1 | Isophorone | 330 | U |
| 88-75-5 | 2-Nitrophenol | 330 | U |
| 105-67-9 | 2,4-Dimethylphenol | 330 | U |
| 65-85-0 | Benzoic Acid | 1600 | U |
| 111-91-1 | bis(2-Chloroethoxy)Methane | 330 | U |
| 120-83-2 | 2,4-Dichlorophenol | 330 | U |
| 120-82-1 | 1,2,4-Trichlorobenzene | 330 | U |
| 91-20-3 | Naphthalene | 330 | U |
| 106-47-8 | 4-Chloroaniline | 330 | U |
| 87-68-3 | Hexachlorobutadiene | 330 | U |
| 59-50-7 | 4-Chloro-3-Methylphenol | 330 | U |
| 91-57-6 | 2-Methylnaphthalene | 330 | U |
| 77-47-4 | Hexachlorocyclopentadiene | 330 | U |
| 88-06-2 | 2,4,6-Trichlorophenol | 330 | U |
| 95-95-4 | 2,4,5-Trichlorophenol | 1600 | U |
| 91-58-7 | 2-Chloronaphthalene | 330 | U |
| 88-74-4 | 2-Nitroaniline | 1600 | U |
| 131-11-3 | Dimethyl Phthalate | 330 | U |
| 208-96-8 | Acenaphthylene | 330 | U |
| 606-20-2 | 2,6-Dinitrotoluene | 330 | U |

UC

# SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

0000322

SBLK01

Lab Name: ITAS-ST.LOUIS  Contract: G0626-0U3-0001

Lab Code: ITSL  Case No.: S53001  SAS No.:  SDG No.: 0016-0001

Matrix: (soil/water) SOIL  Lab Sample ID: OCBLK10004-1

Sample wt/vol: 30.0 (g/mL) G  Lab File ID: A1080

Level: (low/med) LOW  Date Received:

% Moisture: not dec.  dec.  Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC  Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N  pH:  Dilution Factor: 1.00

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG | Q |
|---|---|---|---|
| 99-09-2 | 3-Nitroaniline | 1600 | U |
| 83-32-9 | Acenaphthene | 330 | U |
| 51-28-5 | 2,4-Dinitrophenol | 1600 | U |
| 100-02-7 | 4-Nitrophenol | 1600 | U |
| 132-64-9 | Dibenzofuran | 330 | U |
| 121-14-2 | 2,4-Dinitrotoluene | 330 | U |
| 84-66-2 | Diethylphthalate | 170 | J |
| 7005-72-3 | 4-Chlorophenyl-phenylether | 330 | U |
| 86-73-7 | Fluorene | 330 | U |
| 100-10-6 | 4-Nitroaniline | 1600 | U |
| 534-52-1 | 4,6-Dinitro-2-Methylphenol | 1600 | U |
| 86-30-6 | N-Nitrosodiphenylamine (1) | 330 | U |
| 101-55-3 | 4-Bromophenyl-phenylether | 330 | U |
| 118-74-1 | Hexachlorobenzene | 330 | U |
| 87-86-5 | Pentachlorophenol | 1600 | U |
| 85-01-8 | Phenanthrene | 330 | U |
| 120-12-7 | Anthracene | 330 | U |
| 84-74-2 | Di-n-Butylphthalate | 330 | U |
| 206-44-0 | Fluoranthene | 330 | U |
| 129-00-0 | Pyrene | 330 | U |
| 85-68-7 | Butylbenzylphthalate | 330 | U |
| 91-94-1 | 3,3'-Dichlorobenzidine | 660 | U |
| 56-55-3 | Benzo(a)Anthracene | 330 | U |
| 218-01-9 | Chrysene | 330 | U |
| 117-81-7 | bis(2-Ethylhexyl)Phthalate | 130 | J |
| 117-84-0 | Di-n-Octyl Phthalate | 330 | U |
| 205-99-2 | Benzo(b)Fluoranthene | 330 | U |
| 207-08-9 | Benzo(k)Fluoranthene | 330 | U |
| 50-32-8 | Benzo(a)Pyrene | 330 | U |
| 193-39-5 | Indeno(1,2,3-cd)Pyrene | 330 | U |
| 53-70-3 | Dibenz(a,h)Anthracene | 330 | U |
| 191-24-2 | Benzo(g,h,i)Perylene | 330 | U |

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
~~0006323~~
SBLK01

Lab Name: ITAS-ST.LOUIS Contract: G06G26-0U3-0001

Lab Code: ITSL Case No.: S53001 SAS No.: SDG No.: 0016-0001

Matrix: (soil/water) SOIL Lab Sample ID: OLSLK10004-1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: A1080

Level: (low/med) LOW Date Received:

% Moisture: not dec. dec. Date Extracted: 09/06/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09/13/91

GPC Cleanup: (Y/N) N pH: ~~4.7~~ NA MCW 9-29-91 Dilution Factor: 1.00

Number TICs found: 9

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

| CAS NUMBER | COMPOUND NAME | RT | EST. CONC. | Q |
|---|---|---|---|---|
| 1. 0 | UNKNOWN | 3.98 | 1500 | |
| 2. 0 | Aldol Condensation. | 4.54 | 47000 | JA |
| 3. 0 | UNKNOWN | 5.60 | 720 | J |
| 4. 0 | UNKNOWN | 12.90 | 140 | J |
| 5. 0 | UNKNOWN | 13.19 | 170 | J |
| 6. 0 | UNKNOWN | 16.17 | 210 | J |
| 7. 57103 | Hexadecanoic acid (9CI) | 20.23 | 250 | J |
| 8. 0 | Unknown Hydrocarbon. | 25.17 | 450 | J |

# SEMIVOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL Case No.:S53001 SAS No.: SDG No.:0016-0001

Lab File ID: AA157 DFTPP Injection Date:09/13/91

Instrument ID:MSA DFTPP Injection Time:0946

| m/e | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE |
|---|---|---|
| 51 | 30.0 - 60.0% of mass 198 | 46.6 |
| 68 | Less than 2.0% of mass 69 | 0.0 ( 0.0)1 |
| 69 | Mass 69 relative abundance | 68.5 |
| 70 | Less than 2.0% of mass 69 | 1.0 ( 1.5)1 |
| 127 | 40.0 - 60.0% of mass 198 | 54.2 |
| 197 | Less than 1.0% of mass 198 | 0.0 |
| 198 | Base peak, 100% relative abundance | 100.0 |
| 199 | 5.0 to 9.0% of mass 198 | 6.2 |
| 275 | 10.0 - 30.0% of mass 198 | 17.8 |
| 365 | Greater than 1.00% of mass 198 | 1.39 |
| 441 | Present, but less than mass 443 | 8.8 |
| 442 | Greater than 40.0% of mass 198 | 62.4 |
| 443 | 17.0 - 23.0% of mass 442 | 11.5 ( 18.4)2 |

1-Value is % mass 69 2-Value is % mass 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED | TIME ANALYZED |
|---|---|---|---|---|---|
| 01 | SSTD050 | SSTD050 | A1075 | 09/13/91 | 1006 |
| 02 | SSTD020 | SSTD020 | A1076 | 09/13/91 | 1105 |
| 03 | SSTD080 | SSTD080 | A1077 | 09/13/91 | 1204 |
| 04 | SSTD120 | SSTD120 | A1078 | 09/13/91 | 1303 |
| 05 | SSTD160 | [illegible] | A1079 | 09/13/91 | 1402 |
| 06 | SBLK01 | [illegible]004-1 | A1080 | 09/13/91 | 1519 |
| 07 | 0016-0001 | [illegible] | A1081 | 09/13/91 | 1618 |
| 08 | 0017-0001 | [illegible]2 | A1082 | 09/13/91 | 1708 |
| 09 | 0018-0001 | 1530-[illegible]3 | A1083 | 09/13/91 | 1749 |
| 10 | 0019-0001 | 1530-[illegible]4 | A1084 | 09/13/91 | 1830 |
| 11 | 0019-1001 | 1530-005 | A1085 | 09/13/91 | 1911 |
| 12 | 0020-0001 | 1530-006 | A1086 | 09/13/91 | 1952 |
| 13 | 0021-0001 | 1530-007 | A1087 | 09/13/91 | 2033 |
| 14 | 0022-0001 | 1530-008 | A1088 | 09/13/91 | 2113 |



FORM V SV 1/87 Rev.

5B

# SEMIVOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL Case No.:S53001 SAS No.: SDG No.:0016-0001

Lab File ID: AA158 DFTPP Injection Date:09/15/91

Instrument ID:MSA DFTPP Injection Time:1449

| m/e | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE |
|---|---|---|
| 51 | 30.0 - 60.0% of mass 198 | 42.3 |
| 68 | Less than 2.0% of mass 69 | 0.0 ( 0.0)1 |
| 69 | Mass 69 relative abundance | 59.7 |
| 70 | Less than 2.0% of mass 69 | 0.7 ( 1.2)1 |
| 127 | 40.0 - 60.0% of mass 198 | 50.9 |
| 197 | Less than 1.0% of mass 198 | 0.0 |
| 198 | Base peak, 100% relative abundance | 100.0 |
| 199 | 5.0 to 9.0% of mass 198 | 6.6 |
| 275 | 10.0 - 30.0% of mass 198 | 16.9 |
| 365 | Greater than 1.00% of mass 198 | 1.62 |
| 441 | Present, but less than mass 443 | 8.0 |
| 442 | Greater than 40.0% of mass 198 | 59.6 |
| 443 | 17.0 - 23.0% of mass 442 | 10.8 ( 18.2)2 |

1-Value is % mass 69 2-Value is % mass 442

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

| | EPA SAMPLE NO. | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED | TIME ANALYZED |
|---|---|---|---|---|---|
| 01 | SSTD050 | SSTD050 | A1089 | 09/15/91 | 1512 |
| 02 | 0023-0001 | 1530-009 | A1090 | 09/15/91 | 1601 |
| 03 | 0023-1001 | 1530-010 | A1091 | 09/15/91 | 1642 |
| 04 | 0023-1001MS | 1530-010MS | A1092 | 09/15/91 | 1723 |
| 05 | 0023-1001MSD | [illegible]-010MSD | A1093 | 09/15/91 | 1804 |
| 06 | 0024-0001 | [illegible]1 | A1094 | 09/15/91 | 1844 |



FORM V SV 1/87 Rev.

8B

0000326

# SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name:ITAS-ST.LOUIS Contract:90626-0U3-0001
Lab Code:ITSL Case No.:S53001 SAS No.: SDG No.:0016-0001

Lab File ID (Standard):A1075 Date Analyzed:09/13/91

Instrument ID:MSA Time Analyzed:1006

| | | IS1(DCB) AREA # | RT | IS2(NPT) AREA # | RT | IS3(ANT) AREA # | RT |
|---|---|---|---|---|---|---|---|
| | 12 HOUR STD | 42300 | 7.30 | 167000 | 10.29 | 69700 | 14.74 |
| | UPPER LIMIT | 84600 | | 334000 | | 139400 | |
| | LOWER LIMIT | 21150 | | 83500 | | 34850 | |
| | EPA SAMPLE NO. | | | | | | |
| 01 | 0016-0001 | 41500 | 7.32 | 179000 | 10.29 | 85700 | 14.75 |
| 02 | 0017-0001 | 38300 | 7.32 | 165000 | 10.28 | 83200 | 14.75 |
| 03 | 0018-0001 | 39300 | 7.32 | 171000 | 10.28 | 82900 | 14.74 |
| 04 | 0019-0001 | 38100 | 7.31 | 163000 | 10.28 | 79300 | 14.74 |
| 05 | 0019-1001 | 39700 | 7.31 | 162000 | 10.28 | 81800 | 14.75 |
| 06 | 0020-0001 | 39900 | 7.31 | 167000 | 10.28 | 87200 | 14.74 |
| 07 | 0021-0001 | 38400 | 7.31 | 161000 | 10.28 | 84100 | 14.75 |
| 08 | 0022-0001 | 37200 | 7.31 | 160000 | 10.28 | 84000 | 14.74 |
| 09 | SBLK01 | 40500 | 7.31 | 158000 | 10.28 | 80000 | 14.74 |

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

# Column used to flag internal standard area values with an asterisk



FORM VIII SV-1 1/87 Rev.

# SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: ITAS-ST.LOUIS  Contract: G0626-0U3-0001

Lab Code: ITSL  Case No.: S53001  SAS No.:  SDG No.: 0016-0001

Lab File ID (Standard): A1075  Date Analyzed: 09/13/91

Instrument ID: MSA  Time Analyzed: 1006

| | | IS4(PHN) AREA # | RT | IS5(CRY) AREA # | RT | IS6(PRY) AREA # | RT |
|---|---|---|---|---|---|---|---|
| | 12 HOUR STD | 78900 | 18.47 | 88000 | 25.28 | 98000 | 28.67 |
| | UPPER LIMIT | 157800 | | 176000 | | 196000 | |
| | LOWER LIMIT | 39450 | | 44000 | | 49000 | |
| | EPA SAMPLE NO. | | | | | | |
| 01 | 0016-0001 | 73900 | 18.48 | 110000 | 25.29 | 80900 | 28.67 |
| 02 | 0017-0001 | 67400 | 18.47 | 105000 | 25.28 | 74400 | 28.66 |
| 03 | 0018-0001 | 74600 | 18.48 | 107000 | 25.28 | 82100 | 28.66 |
| 04 | 0019-0001 | 73400 | 18.47 | 102000 | 25.28 | 82000 | 28.67 |
| 05 | 0019-1001 | 78800 | 18.48 | 113000 | 25.29 | 94400 | 28.67 |
| 06 | 0020-0001 | 77100 | 18.47 | 117000 | 25.29 | 87900 | 28.67 |
| 07 | 0021-0001 | 74900 | 18.48 | 113000 | 25.28 | 84900 | 28.67 |
| 08 | 0022-0001 | 75300 | 18.47 | 115000 | 25.27 | 86700 | 28.67 |
| 09 | SBLK01 | 73500 | 18.46 | 102000 | 25.27 | 79200 | 28.66 |

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

# Column used to flag internal standard area values with an asterisk



FORM VIII SV-2  1/87 Rev.

# SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY



Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL Case No.:S53001 SAS No.: SDG No.:0016-0001

Lab File ID (Standard):A1089 Date Analyzed:09/15/91

Instrument ID:MSA Time Analyzed:1512

| | | IS1(DCB) AREA # | RT | IS2(NPT) AREA # | RT | IS3(ANT) AREA # | RT |
|---|---|---|---|---|---|---|---|
| | 12 HOUR STD | 41600 | 7.24 | 160000 | 10.22 | 76100 | 14.67 |
| | UPPER LIMIT | 83200 | | 320000 | | 152200 | |
| | LOWER LIMIT | 20800 | | 80000 | | 38050 | |
| | EPA SAMPLE NO. | | | | | | |
| 01 | 0023-0001 | 44400 | 7.29 | 182000 | 10.26 | 92200 | 14.71 |
| 02 | 0023-1001 | 42700 | 7.28 | 175000 | 10.25 | 89400 | 14.71 |
| 03 | 0024-0001 | 42200 | 7.29 | 175000 | 10.26 | 88800 | 14.72 |
| 04 | 0023-1001MS | 43800 | 7.35 | 181000 | 10.34 | 95500 | 14.79 |
| 05 | 0023-1001MSD | 40300 | 7.30 | 171000 | 10.27 | 91000 | 14.72 |

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

# Column used to flag internal standard area values with an asterisk

# SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY



Lab Name:ITAS-ST.LOUIS Contract:G0626-0U3-0001

Lab Code:ITSL Case No.:S53001 SAS No.: SDG No.:0016-0001

Lab File ID (Standard):A1089 Date Analyzed:09/15/91

Instrument ID:MSA Time Analyzed:1512

| | | IS4(PHN) AREA # | RT | IS5(CRY) AREA # | RT | IS6(PRY) AREA # | RT |
|---|---|---|---|---|---|---|---|
| | 12 HOUR STD | 78600 | 18.40 | 101000 | 25.22 | 90300 | 28.61 |
| | UPPER LIMIT | 157200 | | 202000 | | 180600 | |
| | LOWER LIMIT | 39300 | | 50500 | | 45150 | |
| | EPA SAMPLE NO. | | | | | | |
| 01 | 0023-0001 | 80400 | 18.44 | 116000 | 25.25 | 86000 | 28.64 |
| 02 | 0023-1001 | 77600 | 18.44 | 117000 | 25.25 | 87200 | 28.63 |
| 03 | 0024-0001 | 79000 | 18.44 | 118000 | 25.25 | 98600 | 28.65 |
| 04 | 0023-1001MS | 81600 | 18.52 | 123000 | 25.33 | 99800 | 28.72 |
| 05 | 0023-1001MSD | 76000 | 18.46 | 116000 | 25.26 | 116000 | 28.65 |

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

# Column used to flag internal standard area values with an asterisk

2F

# SOIL PESTICIDE SURROGATE RECOVERY

Lab Name: ITAS-St. Louis Contract: G0626-043-0001

Lab Code: ITSL Case No.: N/A SAS No.: _____ SDG No.: 0016-0001

Level: (low/med) low

| | EPA SAMPLE NO. | S1 (DBC) # | S2 (TCMX) # |
|---|---|---|---|
| 01 | PBLK01 | 111 | 96 |
| 02 | MND33-0016-0001 | 116 | 90 |
| 03 | MND33-0017-0001 | 114 | 89 |
| 04 | MND33-0018-0001 | 125 | 104 |
| 05 | MND33-0019-0001 | 125 | 103 |
| 06 | MND33-0019-1001 | 125 | 109 |
| 07 | MND33-0020-0001 | 90 | 83 |
| 08 | MND33-0021-0001 | 87 | 81 |
| 09 | MND33-0022-0001 | 83 | 81 |
| 10 | MND33-0023-0001 | 107 | 85 |
| 11 | MND33-0023-1001 | 89 | 84 |
| 12 | MND33-0023-1001-MS1 | 96 | 87 |
| 13 | MND33-0023-1001-MSD1 | 100 | 89 |
| 14 | MND33-0023-1001-MS2 | 104 | 90 |
| 15 | MND33-0023-1001-MSD2 | 90 | 84 |
| 16 | MND33-0024-0001 | 98 | 92 |
| 17 | PBLK01 RE | 109 | 95 |
| 18 | | | |
| 19 | | | |
| 20 | | | |
| 21 | | | |
| 22 | | | |
| 23 | | | |
| 24 | | | |
| 25 | | | |
| 26 | | | |
| 27 | | | |
| 28 | | | |
| 29 | | | |
| 30 | | | |

ADVISORY QC LIMITS (24-150)

S1 (DBC) = Dibutylchlorendate

# Column to be used to flag recovery values

* Values outside of QC limits

D Surrogates diluted out

S2 (TCMX) = 2,4,5,6-tetrachloro-meta-xylene



FORM II PEST-2

1/87 Rev.

3F

# SOIL PESTICIDE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ITAS-St. Louis Contract: G0626-043-0001

Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001

Matrix Spike - EPA Sample No.: MN033-0023-1001 Level: (low/med) low

| COMPOUND | SPIKE ADDED (ug/Kg) | SAMPLE CONCENTRATION (ug/Kg) | MS CONCENTRATION (ug/Kg) | MS % REC # | QC. LIMITS REC. |
|---|---|---|---|---|---|
| gamma-BHC (Lindane) | 31 | 3.1 U | 26 | 86 | 46-127 |
| Heptachlor | 31 | 2.3 U | 31 | 101 | 35-130 |
| Aldrin | 31 | 3.1 U | 26 | 85 | 34-132 |
| Dieldrin | 77 | 1.5 U | 68 | 88 | 31-134 |
| Endrin | 77 | 4.6 U | 64 | 84 | 42-139 |
| 4,4'-DDT | 77 | 9.2 U | 68 | 89 | 23-134 |
| Aroclor-1254 | 190 | 190 U | 180 | 91 | |

| COMPOUND | SPIKE ADDED (ug/Kg) | MSD CONCENTRATION (ug/Kg) | MSD % REC # | % RPD # | QC LIMITS RPD | QC LIMITS REC. |
|---|---|---|---|---|---|---|
| gamma-BHC (Lindane) | 31 | 28 | 92 | 7 | 50 | 46-127 |
| Heptachlor | 31 | 33 | 107 | 6 | 31 | 35-130 |
| Aldrin | 31 | 27 | 89 | 5 | 43 | 34-132 |
| Dieldrin | 77 | 70 | 90 | 2 | 38 | 31-134 |
| Endrin | 77 | 70 | 90 | 7 | 45 | 42-139 |
| 4,4'-DDT | 77 | 72 | 94 | 5 | 50 | 23-134 |
| Aroclor 1254 | 190 | 170 | 89 | 2 | | |

# Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 7 outside limits
Spike Recovery: 0 out of 14 outside limits

COMMENTS: No limits established for Aroclor 1254.

4C

# PESTICIDE METHOD BLANK SUMMARY

0000727

Lab Name: ITAS St. Louis Contract: 60676-CL13-0001

Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 6016-0001

Lab Sample ID: BLK 10009 Lab File ID: NA

Matrix: (soil/water) Soil Level: (low/med) low

Date Extracted: 09-09-91 Extraction: (SepF/Cont/Sonc) Sonc

Date Analyzed (1): 09-18-91 Date Analyzed (2): 09-23-91

Time Analyzed (1): 15:30 Time Analyzed (2): 06:22

Instrument ID (1): GC E Instrument ID (2): GC A

GC Column ID (1): DB-1701 GC Column ID (2): DB-5

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

| | EPA SAMPLE NO. | LAB SAMPLE ID | DATE ANALYZED 1 | DATE ANALYZED 2 |
|---|---|---|---|---|
| 01 | MN073-0020-0001 | 1530-006 | 09-18-91 | 09-23-91 |
| 02 | MN073-0021-0001 | 1530-007 | 09-18-91 | 09-23-91 |
| 03 | MN073-0022-0001 | 1530-008 | 09-18-91 | |
| 04 | MN073-0023-0001 | 1530-009 | 09-18-91 | |
| 05 | MN073-0023-1001 | 1530-010 | 09-18-91 | |
| 06 | MN073-0023-1001 MS1 | 1530-010 MS1 | 09-18-91 | |
| 07 | MN073-0023-1001 MSD1 | 1530-010 MSD1 | 09-19-91 | |
| 08 | MN073-0023-1001 MS2 | 1530-010 MS2 | 09-19-91 | |
| 09 | MN073-0023-1001 MSD2 | 1530-010 MSD2 | 09-19-91 | |
| 10 | MN073-0024-0001 | 1530-011 | 09-19-91 | |
| 11 | MN073-0023-1001 MS1 DL | 1530-010 MS1-DL | 09-19-91 | |
| 12 | MN073-0023-1001 MSD1 DL | 1530-010 MSD1-DL | 09-19-91 | |
| 13 | | | | |
| 14 | | | | |
| 15 | | | | |
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| 23 | | | | |
| 24 | | | | |
| 25 | | | | |
| 26 | | | | |

COMMENTS: _____

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
PBLK 01

Lab Name: ITAS-St. Louis Contract: 60626-043-0001

Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001

Matrix: (soil/water) soil Lab Sample ID: BLK 10008

Sample wt/vol: 30.0 (g/mL) g Lab File ID: NA

Level: (low/med) low Date Collected: NA

% Moisture: not dec. 0 dec. NA Date Extracted: 09-09-91

Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91

GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg | Q |
|---|---|---|---|
| 319-84-6 | alpha-BHC | 2.0 | U |
| 319-85-7 | beta-BHC | 4.0 | U |
| 319-86-8 | delta-BHC | 6.0 | U |
| 58-89-9 | gamma-BHC (Lindane) | 2.7 | U |
| 76-44-8 | Heptachlor | 2.0 | U |
| 309-00-2 | Aldrin | 2.7 | U |
| 1024-57-3 | Heptachlor epoxide | 56. | U |
| 959-98-8 | Endosulfan I | 9.4 | U |
| 60-57-1 | Dieldrin | 1.3 | U |
| 72-55-9 | 4,4'-DDE | 2.7 | U |
| 72-20-8 | Endrin | 4.0 | U |
| 33213-65-9 | Endosulfan II | 2.7 | U |
| 72-54-8 | 4,4'-DDD | 7.4 | U |
| 1031-07-8 | Endosulfan sulfate | 44. | U |
| 50-29-3 | 4,4'-DDT | 8.0 | U |
| 72-43-5 | Methoxychlor | 120. | U |
| 53494-70-5 | Endrin ketone | 16. | U |
| 5103-71-9 | alpha-Chlordane | 9.4 | U |
| 5103-74-2 | gamma-Chlordane | 9.4 | U |
| 8001-35-2 | Toxaphene | 160 | U |
| 12674-11-2 | Aroclor-1016 | 80 | U |
| 11104-28-2 | Aroclor-1221 | 80 | U |
| 11141-16-5 | Aroclor-1232 | 80 | U |
| 53469-21-9 | Aroclor-1242 | 80 | U |
| 12672-29-6 | Aroclor-1248 | 80 | U |
| 11097-69-1 | Aroclor-1254 | 160 | U |
| 11096-82-5 | Aroclor-1260 | 160 | U |
| 7421-93-4 | Endrin Aldehyde | 15 | U |

X: Quantitation performed from secondary column.
Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

4C

# PESTICIDE METHOD BLANK SUMMARY

0000729

Lab Name: IFAS - St. Louis Contract: 60676-043-0001

Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001

Lab Sample ID: BLK 10008 Hg Clean Lab File ID: NA

Matrix: (soil/water) soil Level: (low/med) low

Date Extracted: 09-09-91 Extraction: (SepF/Cont/Sonc) Sonc

Date Analyzed (1): 09-18-91 Date Analyzed (2): 09-23-91

Time Analyzed (1): 15:59 Time Analyzed (2): 06:50

Instrument ID (1): GCE Instrument ID (2): GCA

GC Column ID (1): DB-1701 GC Column ID (2): DB-5

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

| | EPA SAMPLE NO. | LAB SAMPLE ID | DATE ANALYZED 1 | DATE ANALYZED 2 |
|---|---|---|---|---|
| 01 | MND77-0016-0001 | 1530-001 | 09-18-91 | 09-23-91 |
| 02 | MND77-0017-0001 | 1530-002 | 09-18-91 | |
| 03 | MND77-0018-0001 | 1530-003 | 09-18-91 | |
| 04 | MND77-0019-0001 | 1530-004 | 09-18-91 | 09-23-91 |
| 05 | MND77-0020-1001 | 1530-005 | 09-18-91 | 09-23-91 |
| 06 | | | | |
| 07 | | | | |
| 08 | | | | |
| 09 | | | | |
| 10 | | | | |
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| 26 | | | | |

COMMENTS: _____

page __ of __

0000730

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

PBIK01 RE

Lab Name: ITAS-St. Louis Contract: 6636-CLP-0001

Lab Code: ITSL Case No.: NA SAS No.: _____ SDG No.: 0016-0001

Matrix: (soil/water) Soil Lab Sample ID: BIK 10008 Hg clean

Sample wt/vol: 30.0 (g/mL) g Lab File ID: NA

Level: (low/med) low Date Collected: NA

% Moisture: not dec. 0 dec. NA Date Extracted: 09-09-91

Extraction: (SepF/Cont/Sonc) Sonc Date Analyzed: 09-18-91

GPC Cleanup: (Y/N) N pH: NA Dilution Factor: 1

| CAS NO. | COMPOUND | CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg | Q |
|---|---|---|---|
| 319-84-6 | alpha-BHC | 2.0 | U |
| 319-85-7 | beta-BHC | 4.0 | U |
| 319-86-8 | delta-BHC | 6.0 | U |
| 58-89-9 | gamma-BHC (Lindane) | 2.7 | U |
| 76-44-8 | Heptachlor | 2.0 | U |
| 309-00-2 | Aldrin | 2.7 | U |
| 1024-57-3 | Heptachlor epoxide | 56. | U |
| 959-98-8 | Endosulfan I | 9.4 | U |
| 60-57-1 | Dieldrin | 1.3 | U |
| 72-55-9 | 4,4'-DDE | 2.7 | U |
| 72-20-8 | Endrin | 4.0 | U |
| 33213-65-9 | Endosulfan II | 2.7 | U |
| 72-54-8 | 4,4'-DDD | 7.4 | U |
| 1031-07-8 | Endosulfan sulfate | 44. | U |
| 50-29-3 | 4,4'-DDT | 8.0 | U |
| 72-43-5 | Methoxychlor | 120. | U |
| 53494-70-5 | Endrin ketone | 16. | U |
| 5103-71-9 | alpha-Chlordane | 9.4 | U |
| 5103-74-2 | gamma-Chlordane | 9.4 | U |
| 8001-35-2 | Toxaphene | 160. | U |
| 12674-11-2 | Aroclor-1016 | 80 | U |
| 11104-28-2 | Aroclor-1221 | 80 | U |
| 11141-16-5 | Aroclor-1232 | 80 | U |
| 53469-21-9 | Aroclor-1242 | 80 | U |
| 12672-29-6 | Aroclor-1248 | 80 | U |
| 11097-69-1 | Aroclor-1254 | 160 | U |
| 11096-82-5 | Aroclor-1260 | 160 | U |
| 7421-93-4 | Endrin Aldehyde | 15 | U |

X: Quantitation performed from secondary column.
Y: Detection Limit determined from secondary column. Peaks observed on primary column quantitated at less than the CRDL on the secondary column.

FORM I PEST

RECEIVED
OCT 2 1991

INTERNATIONAL TECHNOLOGY CORPORATION

# ANALYTICAL SERVICES

## CERTIFICATE OF ANALYSIS

IT Corporation
P.O. Box 549
Oak Ridge, TN 37831
Attn: Derryl Stagg

October 16, 1991

Job Number: ITNT 49310 (REA 37009)

P.O. Number: 464085.01

This is the Certificate of Analysis for the following samples:

| | |
|---|---|
| Client Project ID: | Weston/Mound OU3 |
| Date Received by Lab: | 08/30/91 |
| Number of Samples: | Six (6) |
| Sample Type: | Soil |

### I. Introduction

On 08/30/91, six (6) soil samples arrived at the ITAS-Knoxville, Tennessee, laboratory from ITAS-Mixed Waste Laboratory, Oak Ridge, Tennessee, in support of the Weston/Mound OU3 project. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

### II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected.

The samples were analyzed for total high boiling petroleum hydrocarbons as diesel fuel by gas chromatography/flame ionization detection using California modified method 8015.

Table 1 lists full client ID, ITAS-Knoxville, TN laboratory ID and ITAS-Oak Ridge, TN laboratory ID.

Reviewed and Approved:

Alyce R. Moore

Alyce R. Moore
Laboratory Manager

## III. Quality Control

The samples were analyzed for total high boiling petroleum hydrocarbons as diesel fuel by gas chromatography/flame ionization detection using an SPB-1 column on a Hewlett Packard GC. Matrix spike/matrix duplicate analyses were performed using sample MND33-0023-1001 with acceptable results.

A five point linearity was run; if the relative standard deviation (RSD) of the response factor was less than 20% for total area or individual peaks, (i.e., individual peaks representative of the total hydrocarbon pattern), the average response factor was used for quantification. If the RSD exceeded 20% for the total area, a fitted curve was used. If the RSD exceeded 20% for an individual peak, a quadratic curve was used. Note: Individual peaks were used to determine the detection limit in the presence of interfering hydrocarbons.

A daily standard check was analyzed. If the response for total area was within 15% of the working calibration curve, the daily response factor or the original curve was used for sample quantification. Continuing calibration standards were analyzed after every ten samples.

The surrogate was spiked into the samples at a concentration of 0.8 ppm for soils, but entered into the computer as 100 ppm. This modification allowed the results for each surrogate to be reported in percent, not ppm, as the header indicates.

**Table I**

**Laboratory and Client Sample IDs**

| ITAS-Knoxville Laboratory ID | ITAS-Oak Ridge Laboratory ID | Client ID |
|---|---|---|
| RR4053 | NA | MND33-0023-1001 |
| RR4054 | GG1141 | MND33-0023-1001MS |
| RR4055 | GG1142 | MND33-0023-1001MSD |
| RR4056 | GG1137 | MND33-0020-0001 |
| RR4057 | GG1138 | MND33-0021-0001 |
| RR4058 | GG1139 | MND33-0022-0001 |
| RR4059 | GG1140 | MND33-0023-0001 |
| RR4060 | GG1143 | MND33-0024-0001 |

NA - not available

IT Corporation
October 16, 1991

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Weston/Mound OU3

Job Number: ITNT 49310
(REA 37009)

TOTAL HIGH BOILING PETROLEUM HYDROCARBONS

Results in mg/kg (ppm)

Sample Matrix: Soil

| Lab Sample ID | Client Sample ID | As Compared To Diesel Fuel | |
|---|---|---|---|
| RR4053 | MND33-0023-1001 | 7 | |
| RR4056 | MND33-0020-0001 | 6 | |
| RR4057 | MND33-0021-0001 | 17 | M |
| RR4058 | MND33-0022-0001 | 5 | U |
| RR4059 | MND33-0023-0001 | 8 | M |
| RR4060 | MND33-0024-0001 | 5 | U |
| A3840 | Method Blank | 5 | U |

Date of Extraction: 09/05/91
Date of Analysis: 09/18/91

U – Compound was analyzed for but not detected. The number is the detection limit for the sample.
M - Hydrocarbon quantified and reported as diesel fuel; however, motor oil may also be present.



682-1 89

IT Corporation
October 16, 1991

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Weston/Mound OU3

Job Number: ITNT 49310
(REA 37009)

SOIL MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Results in mg/kg (ppm)

Client Sample ID: MND33-0023-1001
Lab Sample ID: RR4054

| Compound | Conc. Spike Added | Sample Result | Conc. MS | % Rec. | Conc. MSD | % Rec. | RPD |
|---|---|---|---|---|---|---|---|
| diesel fuel | 33 | 7 | 43 | 109 | 39 | 97 | 12 |

Date of Analysis: 09/24/91

RPD – Relative percent difference
U – Compound was analyzed for but not detected. The number is the detection limit for the sample.

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| | | High Boiling Hydrocarbons |
|---|---|---|
| Client Sample ID | Lab Sample ID | n-23 |
| MND33-0023-1001 | RR4053 | 98 |
| MND33-0023-1001MS | RR4054 | 121 |
| MND33-0023-1001MSD | RR4055 | 107 |
| MND33-0020-0001 | RR4056 | 93 |
| MND33-0021-0001 | RR4057 | 101 |
| MND33-0022-0001 | RR4058 | 91 |
| MND33-0023-0001 | RR4059 | 100 |
| MND33-0024-0001 | RR4060 | 81 |
| Method Blank | A3840 | 84 |

| | | | QC Limits |
|---|---|---|---|
| n-23 | = | n-Tricosane | 77.9-128% |

U.S. EPA - CLP

0000013

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_ST._LOUIS_____ Contract: G0626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-0

Initial Calibration Source: SPEX_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

| Analyte | Initial Calibration True | Initial Calibration Found | Initial Calibration %R(1) | Continuing Calibration True | Continuing Calibration Found | Continuing Calibration %R(1) | Continuing Calibration Found | Continuing Calibration %R(1) | M |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 40000.0 | 40080.94 | 100.2 | 40000.0 | 40137.13 | 100.3 | 40423.08 | 101.1 | P |
| Antimony | 4000.0 | 3993.35 | 99.8 | 4000.0 | 3891.88 | 97.3 | 3945.36 | 98.6 | P |
| Arsenic | 30.0 | 31.54 | 105.1 | 30.0 | 32.78 | 109.3 | 30.12 | 100.4 | F |
| Barium | 4000.0 | 3923.74 | 98.1 | 4000.0 | 3939.69 | 98.5 | 3948.85 | 98.7 | P |
| Beryllium | 4000.0 | 3979.84 | 99.5 | 4000.0 | 3949.52 | 98.7 | 3947.67 | 98.7 | P |
| Cadmium | 4000.0 | 3925.93 | 98.1 | 4000.0 | 3807.09 | 95.2 | 3882.79 | 97.1 | P |
| Calcium | 20000.0 | 18691.10 | 93.5 | 20000.0 | 18466.96 | 92.3 | 18381.10 | 91.9 | P |
| Chromium | 4000.0 | 3980.22 | 99.5 | 4000.0 | 3870.93 | 96.8 | 3910.44 | 97.8 | P |
| Cobalt | 4000.0 | 4010.15 | 100.3 | 4000.0 | 3940.58 | 98.5 | 3967.65 | 99.2 | P |
| Copper | 4000.0 | 3884.34 | 97.1 | 4000.0 | 3903.86 | 97.6 | 3907.62 | 97.7 | P |
| Iron | 40000.0 | 42360.36 | 105.9 | 40000.0 | 41608.80 | 104.0 | 41721.46 | 104.3 | P |
| Lead | 30.0 | 31.72 | 105.7 | 30.0 | 32.28 | 107.6 | 33.01 | 110.0 | F |
| Magnesium | 20000.0 | 21985.08 | 109.9 | 20000.0 | 21297.68 | 106.5 | 21447.09 | 107.2 | P |
| Manganese | 4000.0 | 3905.11 | 97.6 | 4000.0 | 3819.74 | 95.5 | 3851.41 | 96.3 | P |
| Mercury | 3.0 | 2.82 | 94.0 | 3.0 | 2.93 | 97.7 | 3.02 | 100.7 | CV |
| Nickel | 4000.0 | 3922.05 | 98.1 | 4000.0 | 3824.47 | 95.6 | 3901.09 | 97.5 | P |
| Potassium | 40000.0 | 38726.90 | 96.8 | 40000.0 | 39115.98 | 97.8 | 42777.22 | 106.9 | P |
| Selenium | 30.0 | 28.41 | 94.7 | 30.0 | 29.64 | 98.8 | | | F |
| Silver | 800.0 | 807.97 | 101.0 | 800.0 | 805.84 | 100.7 | 810.11 | 101.3 | P |
| Sodium | 40000.0 | 39205.32 | 98.0 | 40000.0 | 41005.05 | 102.5 | 42932.58 | 107.3 | P |
| Thallium | 30.0 | 31.58 | 105.3 | 30.0 | 29.83 | 99.4 | 33.02 | 110.1 | F |
| Vanadium | 4000.0 | 3970.87 | 99.3 | 4000.0 | 3902.85 | 97.6 | 3917.34 | 97.9 | P |
| Zinc | 4000.0 | 4012.44 | 100.3 | 4000.0 | 4020.11 | 100.5 | 4054.55 | 101.4 | P |
| Cyanide | 400.0 | 402.00 | 100.5 | 400.0 | 406.50 | 101.6 | 399.40 | 99.8 | AS |

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_ST._LOUIS_____ Contract: GO626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-0

Initial Calibration Source: SPEX_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

| Analyte | Initial Calibration True | Initial Calibration Found | Initial Calibration %R(1) | Continuing Calibration True | Continuing Calibration Found | Continuing Calibration %R(1) | Continuing Calibration Found | Continuing Calibration %R(1) | M |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | 40000.0 | 40218.24 | 100.5 | 39879.69 | 99.7 | P |
| Antimony | | | | 4000.0 | 3940.37 | 98.5 | 3956.67 | 98.9 | P |
| Arsenic | | | | 30.0 | 28.87 | 96.2 | 30.29 | 101.0 | F |
| Barium | | | | 4000.0 | 3984.12 | 99.6 | 3946.81 | 98.7 | P |
| Beryllium | | | | 4000.0 | 3972.71 | 99.3 | 3934.16 | 98.4 | P |
| Cadmium | | | | 4000.0 | 3828.66 | 95.7 | 3804.22 | 95.1 | P |
| Calcium | | | | 20000.0 | 18503.63 | 92.5 | 18203.73 | 91.0 | P |
| Chromium | | | | 4000.0 | 3867.10 | 96.7 | 3837.80 | 95.9 | P |
| Cobalt | | | | 4000.0 | 3961.60 | 99.0 | 3932.89 | 98.3 | P |
| Copper | | | | 4000.0 | 3930.90 | 98.3 | 3882.83 | 97.1 | P |
| Iron | | | | 40000.0 | 41606.13 | 104.0 | 41191.58 | 103.0 | P |
| Lead | | | | 30.0 | 31.58 | 105.3 | 30.16 | 100.5 | F |
| Magnesium | | | | 20000.0 | 21166.70 | 105.8 | 21187.13 | 105.9 | P |
| Manganese | | | | 4000.0 | 3821.92 | 95.5 | 3801.87 | 95.0 | P |
| Mercury | | | | | | | | | NR |
| Nickel | | | | 4000.0 | 3891.23 | 97.3 | 3857.67 | 96.4 | P |
| Potassium | | | | 40000.0 | 40742.39 | 101.9 | 43534.84 | 108.8 | P |
| Selenium | 30.0 | 30.72 | 102.4 | 30.0 | 30.44 | 101.5 | 28.60 | 95.3 | F |
| Silver | | | | 800.0 | 802.27 | 100.3 | 794.44 | 99.3 | P |
| Sodium | | | | 40000.0 | 42499.54 | 106.2 | 43077.27 | 107.7 | P |
| Thallium | 30.0 | 29.20 | 97.3 | 30.0 | 32.84 | 109.5 | | | F |
| Vanadium | | | | 4000.0 | 3902.85 | 97.6 | 3856.56 | 96.4 | P |
| Zinc | | | | 4000.0 | 4069.53 | 101.7 | 4055.95 | 101.4 | P |
| Cyanide | | | | | | | | | NR |

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_ST._LOUIS_____ Contract: G0626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-0

Initial Calibration Source: SPEX_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

| Analyte | Initial Calibration True | Initial Calibration Found | Initial Calibration %R(1) | Continuing Calibration True | Continuing Calibration Found | Continuing Calibration %R(1) | Continuing Calibration Found | Continuing Calibration %R(1) | M |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | 40000.0 | 39722.87 | 99.3 | 39342.33 | 98.4 | P |
| Antimony | | | | 4000.0 | 4021.08 | 100.5 | 3967.47 | 99.2 | P |
| Arsenic | | | | 30.0 | 30.69 | 102.3 | | | F |
| Barium | | | | 4000.0 | 3930.87 | 98.3 | 3923.41 | 98.1 | P |
| Beryllium | | | | 4000.0 | 3926.87 | 98.2 | 3920.56 | 98.0 | P |
| Cadmium | | | | 4000.0 | 3869.72 | 96.7 | 3795.16 | 94.9 | P |
| Calcium | | | | 20000.0 | 18068.11 | 90.3 | 17967.24 | 89.8 | P |
| Chromium | | | | 4000.0 | 3878.29 | 97.0 | 3829.86 | 95.7 | P |
| Cobalt | | | | 4000.0 | 3963.64 | 99.1 | 3925.79 | 98.1 | P |
| Copper | | | | 4000.0 | 3844.53 | 96.1 | 3825.76 | 95.6 | P |
| Iron | | | | 40000.0 | 41329.84 | 103.3 | 41008.22 | 102.5 | P |
| Lead | | | | 30.0 | 31.41 | 104.7 | 31.64 | 105.5 | F |
| Magnesium | | | | 20000.0 | 21039.40 | 105.2 | 21094.00 | 105.5 | P |
| Manganese | | | | 4000.0 | 3830.85 | 95.8 | 3792.20 | 94.8 | P |
| Mercury | | | | | | | | | NR |
| Nickel | | | | 4000.0 | 3871.11 | 96.8 | 3810.30 | 95.3 | P |
| Potassium | | | | 40000.0 | 41612.38 | 104.0 | 39352.81 | 98.4 | P |
| Selenium | | | | 30.0 | 28.14 | 93.8 | | | F |
| Silver | | | | 800.0 | 803.70 | 100.5 | 803.70 | 100.5 | P |
| Sodium | | | | 40000.0 | 42886.11 | 107.2 | 41652.49 | 104.1 | P |
| Thallium | 30.0 | 30.52 | 101.7 | 30.0 | 31.82 | 106.1 | | | F |
| Vanadium | | | | 4000.0 | 3863.84 | 96.6 | 3835.71 | 95.9 | P |
| Zinc | | | | 4000.0 | 4087.23 | 102.2 | 4073.65 | 101.8 | P |
| Cyanide | | | | | | | | | NR |

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

# INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_ST._LOUIS_____ Contract: GO626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-0

Initial Calibration Source: SPEX_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

| Analyte | Initial Calibration True | Initial Calibration Found | Initial Calibration %R(1) | Continuing Calibration True | Continuing Calibration Found | Continuing Calibration %R(1) | Continuing Calibration Found | Continuing Calibration %R(1) | M |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | | | | | | NR |
| Antimony | | | | | | | | | NR |
| Arsenic | 30.0 | 31.57 | 105.2 | 30.0 | 26.88 | 89.6 | 31.76 | 105.9 | F |
| Barium | | | | | | | | | NR |
| Beryllium | | | | | | | | | NR |
| Cadmium | | | | | | | | | NR |
| Calcium | | | | | | | | | NR |
| Chromium | | | | | | | | | NR |
| Cobalt | | | | | | | | | NR |
| Copper | | | | | | | | | NR |
| Iron | | | | | | | | | NR |
| Lead | | | | 30.0 | 31.71 | 105.7 | | | F |
| Magnesium | | | | | | | | | NR |
| Manganese | | | | | | | | | NR |
| Mercury | | | | | | | | | NR |
| Nickel | | | | | | | | | NR |
| Potassium | | | | | | | | | NR |
| Selenium | 30.0 | 32.32 | 107.7 | 30.0 | 29.78 | 99.3 | 29.43 | 98.1 | F |
| Silver | | | | | | | | | NR |
| Sodium | | | | | | | | | NR |
| Thallium | | | | | | | | | NR |
| Vanadium | | | | | | | | | NR |
| Zinc | | | | | | | | | NR |
| Cyanide | | | | | | | | | NR |

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: ITAS_ST._LOUIS_____ Contract: G0626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-0

Initial Calibration Source: SPEX_____

Continuing Calibration Source: SPEX_____

Concentration Units: ug/L

| Analyte | Initial Calibration True | Initial Calibration Found | Initial Calibration %R(1) | Continuing Calibration True | Continuing Calibration Found | Continuing Calibration %R(1) | Continuing Calibration Found | Continuing Calibration %R(1) | M |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | | | | | | NR |
| Antimony | | | | | | | | | NR |
| Arsenic | | | | | | | | | NR |
| Barium | | | | | | | | | NR |
| Beryllium | | | | | | | | | NR |
| Cadmium | | | | | | | | | NR |
| Calcium | | | | | | | | | NR |
| Chromium | | | | | | | | | NR |
| Cobalt | | | | | | | | | NR |
| Copper | | | | | | | | | NR |
| Iron | | | | | | | | | NR |
| Lead | | | | | | | | | NR |
| Magnesium | | | | | | | | | NR |
| Manganese | | | | | | | | | NR |
| Mercury | | | | | | | | | NR |
| Nickel | | | | | | | | | NR |
| Potassium | | | | | | | | | NR |
| Selenium | | | | 30.0 | 27.96 | 93.2 | | | F |
| Silver | | | | | | | | | NR |
| Sodium | | | | | | | | | NR |
| Thallium | | | | | | | | | NR |
| Vanadium | | | | | | | | | NR |
| Zinc | | | | | | | | | NR |
| Cyanide | | | | | | | | | NR |

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2B
CRDL STANDARD FOR AA AND ICP

Lab Name: ITAS ST. LOUIS  Contract: G0626/OU30001

Lab Code: ITSL  Case No.: _____  SAS No.: _____  SDG No.: 0016-000

AA CRDL Standard Source: SPEX/SOLUT P

ICP CRDL Standard Source: SPEX

Concentration Units: ug/L

| Analyte | CRDL Standard for AA | | | CRDL Standard for ICP | | | | |
|---|---|---|---|---|---|---|---|---|
| | True | Found | %R | True | Initial Found | %R | Final Found | %R |
| Aluminum | | | | | | | | |
| Antimony | | | | 120.0 | 123.71 | 103.1 | 129.05 | 107.5 |
| Arsenic | 10.0 | 8.58 | 85.8 | | | | | |
| Barium | | | | | | | | |
| Beryllium | | | | 10.0 | 9.33 | 93.3 | 9.33 | 93.3 |
| Cadmium | | | | 10.0 | 16.05 | 160.5 | 11.50 | 115.0 |
| Calcium | | | | | | | | |
| Chromium | | | | 20.0 | 19.68 | 98.4 | 17.76 | 88.8 |
| Cobalt | | | | 100.0 | 103.75 | 103.8 | 104.79 | 104.8 |
| Copper | | | | 50.0 | 52.57 | 105.1 | 52.57 | 105.1 |
| Iron | | | | | | | | |
| Lead | 3.0 | 3.56 | 118.7 | | | | | |
| Magnesium | | | | | | | | |
| Manganese | | | | 30.0 | 29.85 | 99.5 | 28.99 | 96.6 |
| Mercury | 0.2 | 0.22 | 110.0 | | | | | |
| Nickel | | | | 80.0 | 80.59 | 100.7 | 72.69 | 90.9 |
| Potassium | | | | | | | | |
| Selenium | 5.0 | 5.93 | 118.6 | | | | | |
| Silver | | | | 40.0 | 25.64 | 64.1 | 18.51 | 46.3 |
| Sodium | | | | | | | | |
| Thallium | 10.0 | 11.00 | 110.0 | | | | | |
| Vanadium | | | | 100.0 | 99.76 | 99.8 | 98.84 | 98.8 |
| Zinc | | | | 40.0 | 40.31 | 100.8 | 42.77 | 106.9 |

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2B
CRDL STANDARD FOR AA AND ICP

Lab Name: ITAS_ST._LOUIS_____ Contract: GO626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-00

AA CRDL Standard Source: SPEX_____

ICP CRDL Standard Source: _____

Concentration Units: ug/L

| Analyte | CRDL Standard for AA | | | CRDL Standard for ICP | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Initial | | Final | |
| | True | Found | %R | True | Found | %R | Found | %R |
| Aluminum | | | | | | | | |
| Antimony | | | | | | | | |
| Arsenic | 10.0 | 9.50 | 95.0 | | | | | |
| Barium | | | | | | | | |
| Beryllium | | | | | | | | |
| Cadmium | | | | | | | | |
| Calcium | | | | | | | | |
| Chromium | | | | | | | | |
| Cobalt | | | | | | | | |
| Copper | | | | | | | | |
| Iron | | | | | | | | |
| Lead | | | | | | | | |
| Magnesium | | | | | | | | |
| Manganese | | | | | | | | |
| Mercury | | | | | | | | |
| Nickel | | | | | | | | |
| Potassium | | | | | | | | |
| Selenium | 5.0 | 5.36 | 107.2 | | | | | |
| Silver | | | | | | | | |
| Sodium | | | | | | | | |
| Thallium | 10.0 | 11.17 | 111.7 | | | | | |
| Vanadium | | | | | | | | |
| Zinc | | | | | | | | |

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2B
CRDL STANDARD FOR AA AND ICP

Lab Name: ITAS_ST._LOUIS_____ Contract: G0626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-000

AA CRDL Standard Source: SPEX_____

ICP CRDL Standard Source: _____

Concentration Units: ug/L

| Analyte | CRDL Standard for AA | | | CRDL Standard for ICP | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Initial | | Final | |
| | True | Found | %R | True | Found | %R | Found | %R |
| Aluminum | | | | | | | | |
| Antimony | | | | | | | | |
| Arsenic | | | | | | | | |
| Barium | | | | | | | | |
| Beryllium | | | | | | | | |
| Cadmium | | | | | | | | |
| Calcium | | | | | | | | |
| Chromium | | | | | | | | |
| Cobalt | | | | | | | | |
| Copper | | | | | | | | |
| Iron | | | | | | | | |
| Lead | | | | | | | | |
| Magnesium | | | | | | | | |
| Manganese | | | | | | | | |
| Mercury | | | | | | | | |
| Nickel | | | | | | | | |
| Potassium | | | | | | | | |
| Selenium | 5.0 | 5.24 | 104.8 | | | | | |
| Silver | | | | | | | | |
| Sodium | | | | | | | | |
| Thallium | 10.0 | 11.44 | 114.4 | | | | | |
| Vanadium | | | | | | | | |
| Zinc | | | | | | | | |

3
BLANKS

0000021

Lab Name: ITAS_ST._LOUIS_____ Contract: GO626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-000

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

| Analyte | Initial Calib. Blank (ug/L) | C | Continuing Calibration Blank (ug/L) 1 | C | 2 | C | 3 | C | Prepa-ration Blank | C | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 19.0 | U | 19.0 | U | 19.0 | U | 19.0 | U | 19.000 | U | P |
| Antimony | 45.0 | U | 45.0 | U | 45.0 | U | 45.0 | U | 48.650 | B | P |
| Arsenic | 1.0 | U | 1.0 | U | 1.0 | U | 1.0 | U | 1.000 | U | F |
| Barium | 1.0 | U | 2.0 | B | 1.0 | U | 1.0 | B | 1.010 | B | P |
| Beryllium | 1.0 | U | 1.0 | U | 1.0 | U | 1.0 | U | 1.000 | U | P |
| Cadmium | 4.0 | U | 4.0 | U | 4.0 | U | 4.2 | B | 4.000 | U | P |
| Calcium | 3.0 | U | 3.9 | B | 6.6 | B | 3.0 | U | 18.720 | B | P |
| Chromium | 3.0 | U | 3.0 | U | 3.0 | U | -3.2 | B | 3.000 | U | P |
| Cobalt | 4.1 | B | 4.0 | U | 4.0 | U | 4.0 | U | 4.110 | B | P |
| Copper | 4.5 | B | 3.0 | B | 6.0 | B | 3.8 | B | 3.000 | B | P |
| Iron | 4.2 | B | 7.7 | B | 10.7 | B | 4.0 | U | 5.130 | B | P |
| Lead | 1.0 | U | 1.0 | U | 1.0 | U | 1.0 | B | 1.430 | B | F |
| Magnesium | 1.0 | U | 1.3 | B | 1.3 | B | 1.0 | U | 14.060 | B | P |
| Manganese | 1.0 | U | 1.0 | U | 1.0 | U | 1.0 | U | 1.000 | U | P |
| Mercury | 0.1 | U | 0.1 | U | 0.1 | U | | | 0.100 | U | CV |
| Nickel | 16.0 | U | 16.0 | U | 16.0 | U | 16.0 | U | 16.000 | U | P |
| Potassium | 1443.0 | U | 1443.0 | U | 1443.0 | U | 1443.0 | U | 1443.000 | U | P |
| Selenium | 1.0 | U | 1.0 | U | | | | | 1.000 | U | F |
| Silver | 8.6 | B | 3.0 | U | 6.4 | B | 3.0 | U | 3.000 | U | P |
| Sodium | 12.0 | U | 12.0 | U | 12.0 | U | 12.0 | U | 148.920 | B | P |
| Thallium | 1.0 | U | 1.0 | U | 1.0 | U | | | 1.000 | U | F |
| Vanadium | 3.0 | U | 3.0 | U | 3.0 | U | 3.0 | U | 3.000 | U | P |
| Zinc | 2.0 | U | 2.5 | B | 2.0 | U | 2.0 | U | 2.760 | B | P |
| Cyanide | 10.0 | U | 10.0 | U | 10.0 | U | | | 5.000 | U | AS |

3
BLANKS

Lab Name: ITAS_ST._LOUIS_____ Contract: G0626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-000

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

| Analyte | Initial Calib. Blank (ug/L) | C | Continuing Calibration Blank (ug/L) 1 | C | 2 | C | 3 | C | Prepa-ration Blank | C | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | 19.0 | U | 19.0 | U | 19.0 | U | | | P |
| Antimony | | | 45.0 | U | 45.0 | U | 45.0 | U | | | P |
| Arsenic | | | 1.0 | U | 1.0 | U | | | | | F |
| Barium | | | 1.0 | U | 1.0 | U | 1.4 | B | | | P |
| Beryllium | | | 1.0 | U | 1.0 | U | 1.0 | U | | | P |
| Cadmium | | | 4.0 | U | 4.5 | B | 4.0 | U | | | P |
| Calcium | | | 3.0 | U | 8.2 | B | 13.0 | B | | | P |
| Chromium | | | 3.0 | U | 3.0 | U | 3.0 | U | | | P |
| Cobalt | | | 6.2 | B | 4.0 | U | 4.6 | B | | | P |
| Copper | | | 3.0 | B | 4.5 | B | 6.0 | B | | | P |
| Iron | | | 4.0 | U | 4.0 | U | 6.9 | B | | | P |
| Lead | | | 1.0 | U | 1.2 | B | 1.1 | B | | | F |
| Magnesium | | | 1.0 | U | 1.3 | B | 3.3 | B | | | P |
| Manganese | | | 1.0 | U | 1.0 | U | 1.0 | U | | | P |
| Mercury | | | | | | | | | | | NR |
| Nickel | | | 16.0 | U | 16.0 | U | -17.4 | B | | | P |
| Potassium | | | 1443.0 | U | 1443.0 | U | 1443.0 | U | | | P |
| Selenium | 1.0 | U | 1.0 | U | 1.0 | U | 1.0 | U | | | F |
| Silver | | | 7.8 | B | 3.0 | U | 4.3 | B | | | P |
| Sodium | | | 12.0 | U | 16.9 | B | 15.8 | B | | | P |
| Thallium | 1.0 | U | 1.0 | U | | | | | | | F |
| Vanadium | | | 3.0 | U | 3.0 | U | 3.0 | U | | | P |
| Zinc | | | 2.1 | B | 2.1 | B | 3.8 | B | | | P |
| Cyanide | | | | | | | | | | | NR |

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0000023

3
BLANKS

Lab Name: ITAS_ST._LOUIS_____ Contract: GO626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-000

Preparation Blank Matrix (soil/water): _____

Preparation Blank Concentration Units (ug/L or mg/kg): _____

| Analyte | Initial Calib. Blank (ug/L) | C | Continuing Calibration Blank (ug/L) 1 | C | 2 | C | 3 | C | Prepa-ration Blank | C | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | | | | | | | | NR |
| Antimony | | | | | | | | | | | NR |
| Arsenic | 1.0 | U | 1.0 | U | 1.0 | U | | | | | F |
| Barium | | | | | | | | | | | NR |
| Beryllium | | | | | | | | | | | NR |
| Cadmium | | | | | | | | | | | NR |
| Calcium | | | | | | | | | | | NR |
| Chromium | | | | | | | | | | | NR |
| Cobalt | | | | | | | | | | | NR |
| Copper | | | | | | | | | | | NR |
| Iron | | | | | | | | | | | NR |
| Lead | | | 1.4 | B | | | | | | | F |
| Magnesium | | | | | | | | | | | NR |
| Manganese | | | | | | | | | | | NR |
| Mercury | | | | | | | | | | | NR |
| Nickel | | | | | | | | | | | NR |
| Potassium | | | | | | | | | | | NR |
| Selenium | 1.0 | U | 1.0 | U | 1.0 | U | 1.0 | U | | | F |
| Silver | | | | | | | | | | | NR |
| Sodium | | | | | | | | | | | NR |
| Thallium | 1.0 | U | 1.0 | U | | | | | | | F |
| Vanadium | | | | | | | | | | | NR |
| Zinc | | | | | | | | | | | NR |
| Cyanide | | | | | | | | | | | NR |

FORM III - IN

3/90

4

# ICP INTERFERENCE CHECK SAMPLE

Lab Name: ITAS_ST._LOUIS_____ Contract: G0626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No: _____ SDG No.: 0016-000

ICP ID Number: TJA61E_____ ICS Source: SPEX_____

Concentration Units: ug/L

| Analyte | True Sol. A | True Sol. AB | Initial Found Sol. A | Initial Found Sol. AB | Initial Found %R | Final Found Sol. A | Final Found Sol. AB | Final Found %R |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 500000 | 500000 | 515477 | 508768.0 | 101.8 | 498321 | 499554.2 | 99.9 |
| Antimony | | | | | | | | |
| Arsenic | | | | | | | | |
| Barium | | 500 | | 459.6 | 91.9 | | 458.6 | 91.7 |
| Beryllium | | 500 | | 464.7 | 92.9 | | 457.9 | 91.6 |
| Cadmium | | 1000 | | 930.7 | 93.1 | | 916.0 | 91.6 |
| Calcium | 500000 | 500000 | 518200 | 516300.0 | 103.3 | 516000 | 504400.0 | 100.9 |
| Chromium | | 500 | | 442.8 | 88.6 | | 426.8 | 85.4 |
| Cobalt | | 500 | | 441.6 | 88.3 | | 436.0 | 87.2 |
| Copper | | 500 | | 486.7 | 97.3 | | 477.6 | 95.5 |
| Iron | 200000 | 200000 | 184999 | 186109.2 | 93.1 | 181511 | 181717.0 | 90.9 |
| Lead | | 1000 | | 953.8 | 95.4 | | 941.2 | 94.1 |
| Magnesium | 500000 | 500000 | 516967 | 507239.1 | 101.4 | 517000 | 507200.0 | 101.4 |
| Manganese | | 500 | | 460.5 | 92.1 | | 447.4 | 89.5 |
| Mercury | | | | | | | | |
| Nickel | | 1000 | | 839.5 | 84.0 | | 814.9 | 81.5 |
| Potassium | | | | | | | | |
| Selenium | | | | | | | | |
| Silver | | 1000 | | 947.5 | 94.8 | | 929.2 | 92.9 |
| Sodium | | | | | | | | |
| Thallium | | | | | | | | |
| Vanadium | | 500 | | 440.1 | 88.0 | | 434.5 | 86.9 |
| Zinc | | 1000 | | 968.2 | 96.8 | | 950.6 | 95.1 |

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7

# LABORATORY CONTROL SAMPLE

Lab Name: ITAS_ST._LOUIS_____ Contract: GO626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-000

Solid LCS Source: _____

Aqueous LCS Source: SOL PLUS____

| Analyte | Aqueous (ug/L) True | Found | %R | Solid (mg/kg) True | Found | C | Limits | | %R |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 1000.0 | 1070.04 | 107.0 | | | | | | |
| Antimony | 1000.0 | 881.59 | 88.2 | | | | | | |
| Arsenic | | | | | | | | | |
| Barium | 1000.0 | 1026.38 | 102.6 | | | | | | |
| Beryllium | 1000.0 | 927.82 | 92.8 | | | | | | |
| Cadmium | 1000.0 | 1013.16 | 101.3 | | | | | | |
| Calcium | | | | | | | | | |
| Chromium | 1000.0 | 1015.83 | 101.6 | | | | | | |
| Cobalt | 1000.0 | 1035.61 | 103.6 | | | | | | |
| Copper | 1000.0 | 1000.37 | 100.0 | | | | | | |
| Iron | 1000.0 | 1127.81 | 112.8 | | | | | | |
| Lead | | | | | | | | | |
| Magnesium | | | | | | | | | |
| Manganese | 1000.0 | 1010.82 | 101.1 | | | | | | |
| Mercury | | | | | | | | | |
| Nickel | 1000.0 | 1023.14 | 102.3 | | | | | | |
| Potassium | | | | | | | | | |
| Selenium | | | | | | | | | |
| Silver | | | | | | | | | |
| Sodium | | | | | | | | | |
| Thallium | | | | | | | | | |
| Vanadium | 1000.0 | 1018.61 | 101.9 | | | | | | |
| Zinc | 1000.0 | 1036.04 | 103.6 | | | | | | |
| Cyanide | | | | | | | | | |

7

# LABORATORY CONTROL SAMPLE

Lab Name: ITAS_ST._LOUIS_____ Contract: G0626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-000

Solid LCS Source: _____

Aqueous LCS Source: SOL PLUS____

| Analyte | Aqueous (ug/L) True | Found | %R | Solid (mg/kg) True | Found | C | Limits | | %R |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | | | | | | |
| Antimony | | | | | | | | | |
| Arsenic | | | | | | | | | |
| Barium | | | | | | | | | |
| Beryllium | | | | | | | | | |
| Cadmium | | | | | | | | | |
| Calcium | | | | | | | | | |
| Chromium | | | | | | | | | |
| Cobalt | | | | | | | | | |
| Copper | | | | | | | | | |
| Iron | | | | | | | | | |
| Lead | | | | | | | | | |
| Magnesium | | | | | | | | | |
| Manganese | | | | | | | | | |
| Mercury | | | | | | | | | |
| Nickel | | | | | | | | | |
| Potassium | | | | | | | | | |
| Selenium | | | | | | | | | |
| Silver | 1000.0 | 49.16 | 4.9 | | | | | | |
| Sodium | | | | | | | | | |
| Thallium | | | | | | | | | |
| Vanadium | | | | | | | | | |
| Zinc | | | | | | | | | |
| Cyanide | | | | | | | | | |

7

# LABORATORY CONTROL SAMPLE

Lab Name: ITAS_ST._LOUIS_____ Contract: GO626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-00

Solid LCS Source: _____

Aqueous LCS Source: SOL PLUS____

| Analyte | Aqueous (ug/L) True | Found | %R | Solid (mg/kg) True | Found | C | Limits | | %R |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | | | | | | |
| Antimony | | | | | | | | | |
| Arsenic | | | | | | | | | |
| Barium | | | | | | | | | |
| Beryllium | | | | | | | | | |
| Cadmium | | | | | | | | | |
| Calcium | 20000.0 | 21653.86 | 108.3 | | | | | | |
| Chromium | | | | | | | | | |
| Cobalt | | | | | | | | | |
| Copper | | | | | | | | | |
| Iron | | | | | | | | | |
| Lead | | | | | | | | | |
| Magnesium | 20000.0 | 20170.10 | 100.9 | | | | | | |
| Manganese | | | | | | | | | |
| Mercury | | | | | | | | | |
| Nickel | | | | | | | | | |
| Potassium | 20000.0 | 22296.06 | 111.5 | | | | | | |
| Selenium | | | | | | | | | |
| Silver | | | | | | | | | |
| Sodium | 20000.0 | 21242.91 | 106.2 | | | | | | |
| Thallium | | | | | | | | | |
| Vanadium | | | | | | | | | |
| Zinc | | | | | | | | | |
| Cyanide | | | | | | | | | |

7

0000031

# LABORATORY CONTROL SAMPLE

Lab Name: ITAS_ST._LOUIS_____ Contract: G0626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-000

Solid LCS Source: _____

Aqueous LCS Source: SOL PLUS____

| Analyte | Aqueous (ug/L) True | Found | %R | Solid (mg/kg) True | Found | C | Limits | | %R |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | | | | | | |
| Antimony | | | | | | | | | |
| Arsenic | 40.0 | 43.88 | 109.7 | | | | | | |
| Barium | | | | | | | | | |
| Beryllium | | | | | | | | | |
| Cadmium | | | | | | | | | |
| Calcium | | | | | | | | | |
| Chromium | | | | | | | | | |
| Cobalt | | | | | | | | | |
| Copper | | | | | | | | | |
| Iron | | | | | | | | | |
| Lead | 40.0 | 45.62 | 114.0 | | | | | | |
| Magnesium | | | | | | | | | |
| Manganese | | | | | | | | | |
| Mercury | | | | | | | | | |
| Nickel | | | | | | | | | |
| Potassium | | | | | | | | | |
| Selenium | 40.0 | 37.61 | 94.0 | | | | | | |
| Silver | | | | | | | | | |
| Sodium | | | | | | | | | |
| Thallium | 40.0 | 34.01 | 85.0 | | | | | | |
| Vanadium | | | | | | | | | |
| Zinc | | | | | | | | | |
| Cyanide | | | | | | | | | |

7

# LABORATORY CONTROL SAMPLE

Lab Name: ITAS_ST._LOUIS_____ Contract: G0626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-00

Solid LCS Source: _____

Aqueous LCS Source: SOL PLUS____

| Analyte | Aqueous (ug/L) True | Found | %R | Solid (mg/kg) True | Found | C | Limits | | %R |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | | | | | | |
| Antimony | | | | | | | | | |
| Arsenic | | | | | | | | | |
| Barium | | | | | | | | | |
| Beryllium | | | | | | | | | |
| Cadmium | | | | | | | | | |
| Calcium | | | | | | | | | |
| Chromium | | | | | | | | | |
| Cobalt | | | | | | | | | |
| Copper | | | | | | | | | |
| Iron | | | | | | | | | |
| Lead | | | | | | | | | |
| Magnesium | | | | | | | | | |
| Manganese | | | | | | | | | |
| Mercury | 3.0 | 2.93 | 97.7 | | | | | | |
| Nickel | | | | | | | | | |
| Potassium | | | | | | | | | |
| Selenium | | | | | | | | | |
| Silver | | | | | | | | | |
| Sodium | | | | | | | | | |
| Thallium | | | | | | | | | |
| Vanadium | | | | | | | | | |
| Zinc | | | | | | | | | |
| Cyanide | | | | | | | | | |

7

# LABORATORY CONTROL SAMPLE

Lab Name: ITAS_ST._LOUIS_____ Contract: G0626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.: _____ SDG No.: 0016-000

Solid LCS Source: _____

Aqueous LCS Source: SOL PLUS____

| Analyte | Aqueous (ug/L) True | Found | %R | Solid (mg/kg) True | Found | C | Limits | | %R |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | | | | | | | |
| Antimony | | | | | | | | | |
| Arsenic | | | | | | | | | |
| Barium | | | | | | | | | |
| Beryllium | | | | | | | | | |
| Cadmium | | | | | | | | | |
| Calcium | | | | | | | | | |
| Chromium | | | | | | | | | |
| Cobalt | | | | | | | | | |
| Copper | | | | | | | | | |
| Iron | | | | | | | | | |
| Lead | | | | | | | | | |
| Magnesium | | | | | | | | | |
| Manganese | | | | | | | | | |
| Mercury | | | | | | | | | |
| Nickel | | | | | | | | | |
| Potassium | | | | | | | | | |
| Selenium | | | | | | | | | |
| Silver | | | | | | | | | |
| Sodium | | | | | | | | | |
| Thallium | | | | | | | | | |
| Vanadium | | | | | | | | | |
| Zinc | | | | | | | | | |
| Cyanide | 50.0 | 46.28 | 92.6 | | | | | | |

8

# STANDARD ADDITION RESULTS

Lab Name: ITAS_ST._LOUIS_____ Contract:GO626/OU30001

Lab Code: ITSL__ Case No.: _____ SAS No.:_____ SDG No.:0016-000

Concentration Units: ug/L

| EPA Sample No. | An | 0 ADD ABS | 1 ADD CON | 1 ADD ABS | 2 ADD CON | 2 ADD ABS | 3 ADD CON | 3 ADD ABS | Final Conc. | r | Q |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16-0001_ | AS | 0.068 | 10.00 | 0.096 | 20.00 | 0.154 | 30.00 | 0.179 | 16.8 | 0.9871 | + |
| 16-0001_ | AS | 0.068 | 10.00 | 0.098 | 20.00 | 0.150 | 30.00 | 0.167 | 19.6 | 0.9836 | + |
| 22-0001_ | AS | 0.058 | 10.00 | 0.089 | 20.00 | 0.136 | 30.00 | 0.165 | 15.1 | 0.9959 | |
| 16-0001_ | SE | 0.012 | 10.00 | 0.027 | 20.00 | 0.035 | 30.00 | 0.044 | 13.4 | 0.9889 | + |
| 16-0001_ | SE | 0.013 | 10.00 | 0.029 | 20.00 | 0.035 | 30.00 | 0.046 | 14.3 | 0.9845 | + |
| 17-0001_ | SE | 0.014 | 10.00 | 0.029 | 20.00 | 0.035 | 30.00 | 0.047 | 14.8 | 0.9880 | + |
| 17-0001_ | SE | 0.014 | 10.00 | 0.027 | 20.00 | 0.036 | 30.00 | 0.047 | 13.7 | 0.9976 | |
| 18-0001_ | SE | 0.013 | 10.00 | 0.026 | 20.00 | 0.033 | 30.00 | 0.046 | 12.8 | 0.9937 | + |
| 18-0001_ | SE | 0.013 | 10.00 | 0.028 | 20.00 | 0.036 | 30.00 | 0.046 | 13.7 | 0.9911 | + |
| 19-0001_ | SE | 0.012 | 10.00 | 0.027 | 20.00 | 0.034 | 30.00 | 0.046 | 12.3 | 0.9911 | + |
| 19-0001_ | SE | 0.012 | 10.00 | 0.027 | 20.00 | 0.034 | 30.00 | 0.047 | 10.3 | 0.9922 | + |
| 19-1001_ | SE | 0.014 | 10.00 | 0.027 | 20.00 | 0.033 | 30.00 | 0.047 | 13.8 | 0.9897 | + |
| 19-1001_ | SE | 0.013 | 10.00 | 0.025 | 20.00 | 0.034 | 30.00 | 0.044 | 13.4 | 0.9983 | |

# QUALIFIED DATA SUMMARY TABLE
# EXTRACTABLE PETROLEUM HYDROCARBONS

PREPARED BY: H. Seeley

DATE: 3/3/92

LABORATORY BATCH #: KEA 37009

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATES: 8-29-91

| LABORATORY SAMPLE ID | MOUND SAMPLE ID | EPH mg/Kg | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RR 4057 | MW033-0021-0001 | 17 J | | | | | | |
| RR 4059 | MW033-0023-0001 | 8 J | | | | | | |
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# *Inter-Office Memorandum*

WESTON
MANAGERS DESIGNERS/CONSULTANTS

TO: [redacted]Anderson (DEN)
Lyn Lawlor (5-2)
cc: Cemantha Davisson (w/att)
William Little (w/o att)

FROM: John Price JBP

DATE: 28 October 1991

PROJECT: Mound

W.O. NO.:

SUBJECT: Ohio EPA Data Building 51 and Building 34 sites

ACTION:

Attached you will find the results of split samples that Ohio EPA collected at the Building 34 and Building 51 tank sites. Please retain for your records.

jp\

Received: 08/30/91

KEMRON REPORT
09/27/91 12:24:21

OCT 10 1991

Work Order # N1-08-409

REPORT TO: Ohio EPA DERR
P.O. Box 1049
Columbus, OH 43266-0149
614-644-2295
ATTEN: Steve McBride

PREPARED BY: KEMRON ENVIRONMENTAL SERVICES
109 STARLITE PARK
MARIETTA, OHIO 45750

CERTIFIED BY: David T. Benjamin

ATTEN:
PHONE: (614) 373-4071

CONTACT: D HILL

CLIENT: OEPA 56664 SAMPLES: 3
COMPANY: Ohio EPA
FACILITY: 1800 Watermark Dr.
Columbus, Ohio 43215

ANALYTICAL METHODS AND DOCUMENTATION ARE FOUND AT THE END OF THIS REPORT. ALL RESULTS ON SOILS/SLUDGES ARE REPORTED "AS RECEIVED" UNLESS OTHERWISE SPECIFIED.

WORK ID: K910828-1/Doe Mound
TAKEN: Martha Hatcher
TRANS: Fed Ex
TYPE:
P.O. #: 348504/072591
INVOICE: under separate cover

SAMPLE IDENTIFICATION

01 K910828-1/MND33-0016-0001
02 K910828-1/MND33-0019-0001
03 K910828-1/MND33-0021-0001

TEST CODES and NAMES used on this workorder

| | |
|---|---|
| AG_S | Silver, Total |
| AL_S | Aluminum, Total |
| AS_S | Arsenic, Total |
| BA_S | Barium, Total |
| BE_S | Beryllium, Total |
| CA_S | Calcium, Total |
| CD_S | Cadmium, Total |
| CO_S | Cobalt, Total |
| CR_S | Chromium, Total |
| CU_S | Copper, Total |
| FE_S | Iron, Total |
| HG_S | Mercury, Total |
| K_S | Potassium, Total |
| M8080 | Pesticides and PCB's |
| M8240 | Volatile Organics |
| MG_S | Magnesium, Total |
| MN_S | Manganese, Total |
| NA_S | Sodium, Total |
| NI_S | Nickel, Total |
| PB_S | Lead, Total |
| PCT_S | Percent Solids |
| SB_S | Antimony, Total |
| SE_S | Selenium, Total |
| TL_S | Thallium, Total |
| TPH_S | Petroleum Hydrocarbons |
| V_S | Vanadium, Total |
| ZN_S | Zinc, Total |

RECEIVED
OCT 3 1991
DIV. OF HAZARDOUS WASTE MANAGEMENT

Printed on Recycled Paper

KEMRON ENVIRONMENTAL SERVICES

Received: 08/30/91

KEMRON REPORT

Work Order # N1-08-409

Results by Sample

SAMPLE ID K910828-1/MND33-0016-0001 SAMPLE # 01 FRACTIONS: A,B

Date & Time Collected 08/28/91 Category SOIL

| | | | | | |
|---|---|---|---|---|---|
| AG_S <2 mg/kg Ag | AL_S 930 mg/kg Al | AS_S 2.2 mg/kg As | BA_S 45 mg/kg Ba | BE_S 1 mg/kg Be | CA_S 40,000 mg/kg Ca |
| CD_S <0.5 mg/kg Cd | CO_S 8 mg/kg Co | CR_S 12 mg/kg Cr | CU_S 14 mg/kg Cu | FE_S 19,000 mg/kg Fe | HG_S <0.25 mg/kg Hg |
| K_S 1300 mg/kg K | MG_S 9800 mg/kg Mg | MN_S 480 mg/kg Mn | NA_S 150 mg/kg Na | NI_S 15 mg/kg Ni | PB_S 10 mg/kg Pb |
| PCT_S 79 % wt. | SB_S <10 mg/kg Sb | SE_S 0.3 mg/kg Se | TL_S <0.25 mg/kg Tl | TPH_S <25 mg/kg | V_S 41 mg/kg V |
| ZN_S 44 mg/kg Zn | | | | | |

Received: 08/30/91

KEMRON REPORT
Results by Sample

Work Order # N1-08-409

SAMPLE ID K910828-1/MND33-0016-0001 FRACTION 01B TEST CODE M8080 NAME Pesticides and PCB's
Date & Time Collected 08/28/91 Category SOIL

ANALYST: SLN EXTRACTED: 09/03/91 FILE #: 4570
INSTRMT: HP_IV INJECTED: 09/10/91 FACTOR: 165 * UNITS: ug/kg VERIFIED: RJW

| CAS# | COMPOUND | RESULT | DET LIMIT |
|---|---|---|---|
| 319-84-6 | alpha-BHC | BDL | 8 |
| 319-85-7 | beta-BHC | BDL | 8 |
| 319-86-8 | delta-BHC | BDL | 8 |
| 58-89-9 | gamma-BHC (Lindane) | BDL | 8 |
| 76-44-8 | Heptachlor | BDL | 8 |
| 309-00-2 | Aldrin | BDL | 8 |
| 1024-57-3 | Heptachlor epoxide | BDL | 8 |
| 959-98-8 | Endosulfan I | BDL | 8 |
| 60-57-1 | Dieldrin | BDL | 17 |
| 72-55-9 | 4,4'-DDE | BDL | 17 |
| 72-20-8 | Endrin | BDL | 17 |
| 33213-65-9 | Endosulfan II | BDL | 17 |
| 72-54-8 | 4,4'-DDD | BDL | 17 |
| 1031-07-8 | Endosulfan sulfate | BDL | 17 |
| 50-29-3 | 4,4'-DDT | BDL | 17 |
| 72-43-5 | Methoxychlor | BDL | 83 |
| 53494-70-5 | Endrin ketone | BDL | 17 |
| 5103-71-9 | alpha-Chlordane | BDL | 83 |
| 5103-74-2 | gamma-Chlordane | BDL | 83 |
| 8001-35-2 | Toxaphene | BDL | 165 |
| 12674-11-2 | Aroclor-1016 | BDL | 83 |
| 11104-28-2 | Aroclor-1221 | BDL | 83 |
| 11141-16-5 | Aroclor-1232 | BDL | 83 |
| 5369-21-9 | Aroclor-1242 | BDL | 83 |
| 12672-29-6 | Aroclor-1248 | BDL | 83 |
| 11097-69-1 | Aroclor-1254 | BDL | 165 |
| 11096-82-5 | Aroclor-1260 | BDL | 165 |

NOTES AND DEFINITIONS FOR THIS REPORT.
BDL=BELOW DETECTION LIMIT
NA = NOT ANALYZED
* = ELEVATED DETECTION LIMIT DUE TO SAMPLE MATRIX INTERFERENCE

Received: 08/30/91

KEMRON REPORT
Results by Sample

Work Order # N1-08-409

SAMPLE ID K910828-1/MND33-0016-0001 FRACTION 01A TEST CODE M8240 NAME Volatile Organics
Date & Time Collected 08/28/91 Category SOIL

ANALYST: JLK FILE #: 20E19525
INSTRMT: FINN2 INJECTED: 09/08/91 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

| CAS# | COMPOUND | RESULT | PQL |
|---|---|---|---|
| 74-87-3 | Chloromethane | BQL | 10 |
| 74-83-9 | Bromomethane | BQL | 10 |
| 75-01-4 | Vinyl chloride | BQL | 10 |
| 75-00-3 | Chloroethane | BQL | 10 |
| 75-09-2 | Methylene chloride | 940 | 5.0 |
| 67-64-1 | Acetone | 440 | 100 |
| 75-15-0 | Carbon disulfide | BQL | 5.0 |
| 75-35-4 | 1,1-Dichloroethene | BQL | 5.0 |
| 75-34-3 | 1,1-Dichloroethane | BQL | 5.0 |
| 156-60-5 | trans-1,2-Dichloroethene | BQL | |
| 67-66-3 | Chloroform | BQL | 5.0 |
| 107-06-2 | 1,2-Dichloroethane | BQL | 5.0 |
| 78-93-3 | 2-Butanone | 190 | 100 |
| 71-55-6 | 1,1,1-Trichloroethane | 7 | 5.0 |
| 56-23-5 | Carbon tetrachloride | BQL | 5.0 |
| 108-05-4 | Vinyl acetate | BQL | 10 |
| 75-27-4 | Bromodichloromethane | BQL | 5.0 |
| 78-87-5 | 1,2-Dichloropropane | BQL | 5.0 |
| 10061-01-5 | cis-1,3-Dichloropropene | BQL | 5.0 |
| 79-01-6 | Trichloroethene | BQL | 5.0 |
| 124-48-1 | Dibromochloromethane | BQL | 5.0 |
| 79-00-5 | 1,1,2-Trichloroethane | BQL | 5.0 |
| 71-43-2 | Benzene | BQL | 5.0 |
| 10061-02-6 | trans-1,3-Dichloropropene | BQL | 5.0 |
| 110-75-8 | 2-Chloroethyl vinyl ether | BQL | 10 |
| 75-25-2 | Bromoform | BQL | 5.0 |
| 591-78-6 | 2-Hexanone | BQL | 10 |
| 108-10-1 | 4-Methyl-2-pentanone | BQL | 10 |
| 127-18-4 | Tetrachloroethene | BQL | 5.0 |
| 108-88-3 | Toluene | 25 | 5.0 |
| 79-34-5 | 1,1,2,2,-Tetrachloroethane | BQL | 5.0 |
| 108-90-7 | Chlorobenzene | 14 | 5.0 |

Received: 08/30/91

KEMRON REPORT
Results by Sample

Work Order # N1-08-409
Continued From Above

SAMPLE ID K910828-1/MND33-0016-0001 FRACTION 01A TEST CODE M8240 NAME Volatile Organics
Date & Time Collected 08/28/91 Category SOIL

| CAS# | COMPOUND | RESULT | PQL |
|---|---|---|---|
| 100-41-4 | Ethyl benzene | 8 | 5.0 |
| 100-42-5 | Styrene | BQL | 5.0 |
| 1330-20-7 | Xylenes (Total) | 37 | 5.0 |

SURROGATES

| | | |
|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | % Recovery |
| Toluene-d8 | 142 ** | % Recovery |
| p-Bromofluorobenzene | 87 | % Recovery |

NOTES AND DEFINITIONS FOR THIS REPORT
BQL = BELOW PRACTICAL QUANTITATION LIMIT (PQL)
* = SEMI-QUANTITATIVE SCREEN ONLY
** = DILUTION ANALYSIS CONFIRMS SAMPLE MATRIX INTERFERENCE

Results by Sample

SAMPLE ID K910828-1/MND33-0019-0001 SAMPLE # 02 FRACTIONS: A,B
Date & Time Collected 08/28/91 Category SOIL

| | | | | | |
|---|---|---|---|---|---|
| AG_S <2 mg/kg Ag | AL_S 1200 mg/kg Al | AS_S 2.3 mg/kg As | BA_S 45 mg/kg Ba | BE_S 1 mg/kg Be | CA_S 32,000 mg/kg Ca |
| CD_S <0.5 mg/kg Cd | CO_S 10 mg/kg Co | CR_S 15 mg/kg Cr | CU_S 16 mg/kg Cu | FE_S 27,000 mg/kg Fe | HG_S <0.25 mg/kg Hg |
| K_S 1400 mg/kg K | MG_S 6600 mg/kg Mg | MN_S 530 mg/kg Mn | NA_S 160 mg/kg Na | NI_S 19 mg/kg Ni | PB_S 10 mg/kg Pb |
| PCT_S 80 % wt. | SB_S <10 mg/kg Sb | SE_S 0.2 mg/kg Se | TL_S <0.25 mg/kg Tl | TPH_S <25 mg/kg | V_S 32 mg/kg V |
| ZN_S 50 mg/kg Zn | | | | | |

Received: 08/30/91

KEMRON REPORT

Results by Sample

Work Order # N1-08-409

SAMPLE ID K910828-1/MND33-0019-0001 FRACTION 02B TEST CODE M8080 NAME Pesticides and PCB's
Date & Time Collected 08/28/91 Category SOIL

ANALYST: SLN EXTRACTED: 09/03/91 FILE #: 4571
INSTRMT: HP_IV INJECTED: 09/10/91 FACTOR: 330* UNITS: ug/kg VERIFIED: RJW

| CAS# | COMPOUND | RESULT | DET LIMIT |
|---|---|---|---|
| 319-84-6 | alpha-BHC | BDL | 20 |
| 319-85-7 | beta-BHC | BDL | 20 |
| 319-86-8 | delta-BHC | BDL | 20 |
| 58-89-9 | gamma-BHC (Lindane) | BDL | 20 |
| 76-44-8 | Heptachlor | BDL | 20 |
| 309-00-2 | Aldrin | BDL | 20 |
| 1024-57-3 | Heptachlor epoxide | BDL | 20 |
| 959-98-8 | Endosulfan I | BDL | 20 |
| 60-57-1 | Dieldrin | BDL | 33 |
| 72-55-9 | 4,4'-DDE | BDL | 33 |
| 72-20-8 | Endrin | BDL | 33 |
| 33213-65-9 | Endosulfan II | BDL | 33 |
| 72-54-8 | 4,4'-DDD | BDL | 33 |
| 1031-07-8 | Endosulfan sulfate | BDL | 33 |
| 50-29-3 | 4,4'-DDT | BDL | 33 |
| 72-43-5 | Methoxychlor | BDL | 170 |
| 53494-70-5 | Endrin ketone | BDL | 33 |
| 5103-71-9 | alpha-Chlordane | BDL | 170 |
| 5103-74-2 | gamma-Chlordane | BDL | 170 |
| 8001-35-2 | Toxaphene | BDL | 330 |
| 12674-11-2 | Aroclor-1016 | BDL | 170 |
| 11104-28-2 | Aroclor-1221 | BDL | 170 |
| 11141-16-5 | Aroclor-1232 | BDL | 170 |
| 5369-21-9 | Aroclor-1242 | BDL | 170 |
| 12672-29-6 | Aroclor-1248 | BDL | 170 |
| 11097-69-1 | Aroclor-1254 | BDL | 330 |
| 11096-82-5 | Aroclor-1260 | BDL | 330 |

NOTES AND DEFINITIONS FOR THIS REPORT.
BDL=BELOW DETECTION LIMIT
NA = NOT ANALYZED
* = ELEVATED DETECTION LIMIT DUE TO SAMPLE MATRIX INTERFERENCE

Received: 08/30/91 Results by Sample

SAMPLE ID K910828-1/MND33-0019-0001 FRACTION 02A TEST CODE M8240 NAME Volatile Organics
Date & Time Collected 08/28/91 Category SOIL

ANALYST: JLK FILE #: 20E19526
INSTRMT: FINN2 INJECTED: 09/08/91 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

| CAS# | COMPOUND | RESULT | PQL |
|---|---|---|---|
| 74-87-3 | Chloromethane | BQL | 10 |
| 74-83-9 | Bromomethane | BQL | 10 |
| 75-01-4 | Vinyl chloride | BQL | 10 |
| 75-00-3 | Chloroethane | BQL | 10 |
| 75-09-2 | Methylene chloride | 430 | 5.0 |
| 67-64-1 | Acetone | 170 | 100 |
| 75-15-0 | Carbon disulfide | BQL | 5.0 |
| 75-35-4 | 1,1-Dichloroethene | BQL | 5.0 |
| 75-34-3 | 1,1-Dichloroethane | BQL | 5.0 |
| 156-60-5 | trans-1,2-Dichloroethene | BQL | |
| 67-66-3 | Chloroform | BQL | 5.0 |
| 107-06-2 | 1,2-Dichloroethane | BQL | 5.0 |
| 78-93-3 | 2-Butanone | BQL | 100 |
| 71-55-6 | 1,1,1-Trichloroethane | 5 | 5.0 |
| 56-23-5 | Carbon tetrachloride | BQL | 5.0 |
| 108-05-4 | Vinyl acetate | BQL | 10 |
| 75-27-4 | Bromodichloromethane | BQL | 5.0 |
| 78-87-5 | 1,2-Dichloropropane | BQL | 5.0 |
| 10061-01-5 | cis-1,3-Dichloropropene | BQL | 5.0 |
| 79-01-6 | Trichloroethene | BQL | 5.0 |
| 124-48-1 | Dibromochloromethane | BQL | 5.0 |
| 79-00-5 | 1,1,2-Trichloroethane | BQL | 5.0 |
| 71-43-2 | Benzene | BQL | 5.0 |
| 10061-02-6 | trans-1,3-Dichloropropene | BQL | 5.0 |
| 110-75-8 | 2-Chloroethyl vinyl ether | BQL | 10 |
| 75-25-2 | Bromoform | BQL | 5.0 |
| 591-78-6 | 2-Hexanone | BQL | 10 |
| 108-10-1 | 4-Methyl-2-pentanone | BQL | 10 |
| 127-18-4 | Tetrachloroethene | BQL | 5.0 |
| 108-88-3 | Toluene | 16 | 5.0 |
| 79-34-5 | 1,1,2,2,-Tetrachloroethane | BQL | 5.0 |
| 108-90-7 | Chlorobenzene | 12 | 5.0 |

Received: 08/30/91

KEMRON REPORT
Results by Sample

Work Order # N1-08-409
Continued From Above

SAMPLE ID K910828-1/MND33-0019-0001 FRACTION 02A TEST CODE M8240 NAME Volatile Organics
Date & Time Collected 08/28/91 Category SOIL

| CAS# | COMPOUND | RESULT | PQL |
|---|---|---|---|
| 100-41-4 | Ethyl benzene | 6 | 5.0 |
| 100-42-5 | Styrene | BQL | 5.0 |
| 1330-20-7 | Xylenes (Total) | 28 | 5.0 |

SURROGATES

| | | |
|---|---|---|
| 1,2-Dichloroethane-d4 | 103 | % Recovery |
| Toluene-d8 | 132 ** | % Recovery |
| p-Bromofluorobenzene | 89 | % Recovery |

NOTES AND DEFINITIONS FOR THIS REPORT
BQL = BELOW PRACTICAL QUANTITATION LIMIT (PQL)
* = SEMI-QUANTITATIVE SCREEN ONLY
** = DILUTION ANALYSIS CONFIRMS SAMPLE MATRIX INTERFERENCE

Received: 08/30/91
Results by Sample

SAMPLE ID K910828-1/MND33-0021-0001 SAMPLE # 03 FRACTIONS: A,B
Date & Time Collected 08/29/91 Category SOIL

| | | | | | |
|---|---|---|---|---|---|
| AG_S <2 mg/kg Ag | AL_S 320 mg/kg Al | AS_S 1.9 mg/kg As | BA_S 29 mg/kg Ba | BE_S <0.5 mg/kg Be | CA_S 140,000 mg/kg Ca |
| CD_S <0.5 mg/kg Cd | CO_S 3 mg/kg Co | CR_S 5.7 mg/kg Cr | CU_S 8.3 mg/kg Cu | FE_S 12,000 mg/kg Fe | HG_S <0.25 mg/kg Hg |
| K_S 610 mg/kg K | MG_S 50,000 mg/kg Mg | MN_S 190 mg/kg Mn | NA_S 120 mg/kg Na | NI_S 8.7 mg/kg Ni | PB_S <10 mg/kg Pb |
| PCT_S 86 % wt. | SB_S <10 mg/kg Sb | SE_S 0.3 mg/kg Se | TL_S <0.25 mg/kg Tl | TPH_S <25 mg/kg | V_S 120 mg/kg V |
| ZN_S 29 mg/kg Zn | | | | | |

Received: 08/30/91

KEMRON REPORT
Results by Sample

Work Order # N1-08-409

SAMPLE ID K910828-1/MND33-0021-0001 FRACTION 03B TEST CODE M8080 NAME Pesticides and PCB's
Date & Time Collected 08/29/91 Category SOIL

ANALYST: SLN EXTRACTED: 09/03/91 FILE #: 4574
INSTRMT: HP_IV INJECTED: 09/10/91 FACTOR: 33 UNITS: ug/kg VERIFIED: RJW

| CAS# | COMPOUND | RESULT | DET LIMIT |
|---|---|---|---|
| 319-84-6 | alpha-BHC | BDL | 2 |
| 319-85-7 | beta-BHC | BDL | 2 |
| 319-86-8 | delta-BHC | BDL | 2 |
| 58-89-9 | gamma-BHC (Lindane) | BDL | 2 |
| 76-44-8 | Heptachlor | BDL | 2 |
| 309-00-2 | Aldrin | BDL | 2 |
| 1024-57-3 | Heptachlor epoxide | BDL | 2 |
| 959-98-8 | Endosulfan I | BDL | 2 |
| 60-57-1 | Dieldrin | BDL | 3.3 |
| 72-55-9 | 4,4'-DDE | BDL | 3.3 |
| 72-20-8 | Endrin | BDL | 3.3 |
| 33213-65-9 | Endosulfan II | BDL | 3.3 |
| 72-54-8 | 4,4'-DDD | BDL | 3.3 |
| 1031-07-8 | Endosulfan sulfate | BDL | 3.3 |
| 50-29-3 | 4,4'-DDT | BDL | 3.3 |
| 72-43-5 | Methoxychlor | BDL | 17 |
| 53494-70-5 | Endrin ketone | BDL | 3.3 |
| 5103-71-9 | alpha-Chlordane | BDL | 17 |
| 5103-74-2 | gamma-Chlordane | BDL | 17 |
| 8001-35-2 | Toxaphene | BDL | 33.0 |
| 12674-11-2 | Aroclor-1016 | BDL | 17 |
| 11104-28-2 | Aroclor-1221 | BDL | 17 |
| 11141-16-5 | Aroclor-1232 | BDL | 17 |
| 5369-21-9 | Aroclor-1242 | BDL | 17 |
| 12672-29-6 | Aroclor-1248 | BDL | 17 |
| 11097-69-1 | Aroclor-1254 | BDL | 33.0 |
| 11096-82-5 | Aroclor-1260 | BDL | 33.0 |

NOTES AND DEFINITIONS FOR THIS REPORT.
BDL=BELOW DETECTION LIMIT
NA = NOT ANALYZED

Received: 08/30/91

Results by Sample

SAMPLE ID K910828-1/MND33-0021-0001 FRACTION 03A TEST CODE M8240 NAME Volatile Organics
Date & Time Collected 08/29/91 Category SOIL

ANALYST: BCW FILE #: 20E19606
INSTRMT: FINN2 INJECTED: 09/11/91 FACTOR: 1 UNITS: ug/kg VERIFIED: RJW

| CAS# | COMPOUND | RESULT | PQL |
|---|---|---|---|
| 74-87-3 | Chloromethane | BQL | 10 |
| 74-83-9 | Bromomethane | BQL | 10 |
| 75-01-4 | Vinyl chloride | BQL | 10 |
| 75-00-3 | Chloroethane | BQL | 10 |
| 75-09-2 | Methylene chloride | 1100 | 5.0 |
| 67-64-1 | Acetone | BQL | 100 |
| 75-15-0 | Carbon disulfide | BQL | 5.0 |
| 75-35-4 | 1,1-Dichloroethene | BQL | 5.0 |
| 75-34-3 | 1,1-Dichloroethane | BQL | 5.0 |
| 156-60-5 | trans-1,2-Dichloroethene | BQL | |
| 67-66-3 | Chloroform | BQL | 5.0 |
| 107-06-2 | 1,2-Dichloroethane | BQL | 5.0 |
| 78-93-3 | 2-Butanone | BQL | 100 |
| 71-55-6 | 1,1,1-Trichloroethane | BQL | 5.0 |
| 56-23-5 | Carbon tetrachloride | BQL | 5.0 |
| 108-05-4 | Vinyl acetate | BQL | 10 |
| 75-27-4 | Bromodichloromethane | BQL | 5.0 |
| 78-87-5 | 1,2-Dichloropropane | BQL | 5.0 |
| 10061-01-5 | cis-1,3-Dichloropropene | BQL | 5.0 |
| 79-01-6 | Trichloroethene | BQL | 5.0 |
| 124-48-1 | Dibromochloromethane | BQL | 5.0 |
| 79-00-5 | 1,1,2-Trichloroethane | BQL | 5.0 |
| 71-43-2 | Benzene | BQL | 5.0 |
| 10061-02-6 | trans-1,3-Dichloropropene | BQL | 5.0 |
| 110-75-8 | 2-Chloroethyl vinyl ether | BQL | 10 |
| 75-25-2 | Bromoform | BQL | 5.0 |
| 591-78-6 | 2-Hexanone | BQL | 10 |
| 108-10-1 | 4-Methyl-2-pentanone | BQL | 10 |
| 127-18-4 | Tetrachloroethene | BQL | 5.0 |
| 108-88-3 | Toluene | BQL | 5.0 |
| 79-34-5 | 1,1,2,2,-Tetrachloroethane | BQL | 5.0 |
| 108-90-7 | Chlorobenzene | BQL | 5.0 |

Received: 08/30/91

KEMRON REPORT
Results by Sample

Work Order # N1-08-409
Continued From Above

SAMPLE ID K910828-1/MND33-0021-0001 FRACTION 03A TEST CODE M8240 NAME Volatile Organics
Date & Time Collected 08/29/91 Category SOIL

| CAS# | COMPOUND | RESULT | PQL |
|---|---|---|---|
| 100-41-4 | Ethyl benzene | BQL | 5.0 |
| 100-42-5 | Styrene | BQL | 5.0 |
| 1330-20-7 | Xylenes (Total) | BQL | 5.0 |

SURROGATES

| | | |
|---|---|---|
| 1,2-Dichloroethane-d4 | 95 | % Recovery |
| Toluene-d8 | 117 | % Recovery |
| p-Bromofluorobenzene | 84 | % Recovery |

NOTES AND DEFINITIONS FOR THIS REPORT
BQL = BELOW PRACTICAL QUANTITATION LIMIT (PQL)
* = SEMI-QUANTITATIVE SCREEN ONLY

Test Methodology

TEST CODE AG_S NAME Silver, Total

SW3050 followed by SW6010 or SW7760

TEST CODE AL_S NAME Aluminum, Total

SW3050 followed by SW6010 or SW7020

TEST CODE AS_S NAME Arsenic, Total

SW3050 followed by SW7061 - Arsenic

TEST CODE BA_S NAME Barium, Total

SW3050 followed by SW6010

TEST CODE BE_S NAME Beryllium, Total

SW3050 followed by SW6010

TEST CODE CA_S NAME Calcium, Total

SW 3050 followed by SW6010 or SW7140

TEST CODE CD_S NAME Cadmium, Total

SW3050 followed by SW6010 - Cadmium

TEST CODE CO_S NAME Cobalt, Total

SW3050 followed by SW6010

TEST CODE CR_S NAME Chromium, Total

SW3050 followed by SW6010 or SW7190 - Chromium

TEST CODE CU_S NAME Coppér, Total

SW3050 followed by SW6010

TEST CODE FE_S NAME Iron, Total

SW3050 followed by SW6010 or SW7420

TEST CODE HG_S NAME Mercury, Total

SW7471 (AA - Cold Vapor Method)

TEST CODE K_S NAME Potassium, Total

SW3050 followed by SW6010 or SW7610

TEST CODE M8080 NAME Pesticides and PCB's

EPA Method 608/8080 (SW-846)

TEST CODE M8240 NAME Volatile Organics

EPA Method 8240 (SW-846)

TEST CODE MN_S NAME Manganese, Total

SW3050 followed by SW6010 or SW7460

TEST CODE NA_S NAME Sodium, Total

SW3050 followed by SW6010 or SW7770

TEST CODE NI_S NAME Nickel, Total

SW3050 followed by SW6010

TEST CODE PB_S NAME Lead, Total

SW3050 followed by SW6010 or SW7421 - Lead

TEST CODE PCT_S NAME Percent Solids

EPA Method 160.3 - Gravimetric, Dryed at 103-105 Degrees C
To convert test results to "Dry Weight Basis" use this formula:

RESULT (REPORTED) X 100

TEST CODE PCT_S NAME Percent Solids

RESULT (DRY WT.) = ----------
PERCENT SOLIDS

TEST CODE SB_S NAME Antimony, Total

SW3050 followed by SW6010 or SW7041

TEST CODE SE_S NAME Selenium, Total

SW3050 followed by SW7741

TEST CODE TL_S NAME Thallium, Total

SW3050 followed by SW7841

TEST CODE TPH_S NAME Petroleum Hydrocarbons

EPA Method 418.1 (IR)

TEST CODE V_S NAME Vanadium, Total

SW3050 followed by SW6010

TEST CODE ZN_S NAME Zinc, Total

SW3050 followed by SW6010 or SW7950

ENVIRONMENTAL SERVICES

OCT 10 1991 15459

# CHAIN-OF-CUSTODY RECORD

Project Contact: Steve McBride, OEPA/DERR

Turn Around Requirements: NORMAL

Page 1 of 1.

Project No.: K910828-1

Project Name: DOE MOUND

Sampler (print): MARTHA L. HATCHER

Signature: Martha L. Hatcher

| Sample I.D. No. | Comp | Grab | Date | Time | Sample Location | NUMBER OF SAMPLES | HOLD | % SOLIDS | VOA | ACID EXTRACT. | BASE/NEUTR. EXT. | EP TOX.-METALS | EP TOX.-ORGAN. | TOT. METALS-P.P.L. | TOT. METALS-RCRA | PCBs | PESTICIDES | TPH | BETX | PHENOLICS | TAL METALS | ADDITIONAL REQUIREMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MND33-0016-0001 | | X | 8/28/91 | | Building 51 | 1 | | | X | | | | | | | X | X | X | | | X | If not enough sample volume in larger jar (blue cap), sample analyses should follow in this order: ① Metals ② TPH ③ Pesticides/PCBs |
| MND33-0019-0001 | | X | 8/28/91 | | Building 51 | 1 | | | X | | | | | | | X | X | X | | | X | |
| MND33-0021-0001 | | X | 8/29/91 | | Building 3A | 1 | | | X | | | | | | | X | X | X | | | X | |

Chain of Custody Sealed in Cooler

| Relinquished by: (Signature) | Date | Time | Received by: (Signature) | Relinquished by: (Signature) | Date | Time | Received by: (Signature) |
|---|---|---|---|---|---|---|---|
| Martha Hatcher | 8/29/91 | 1430 | | | | | |

| Relinquished by: (Signature) | Date | Time | Received for Laboratory by: (Signature) | Date | Time | Remarks: |
|---|---|---|---|---|---|---|
| | | | Janet Williams | 8/30 | 1:30 | COC sealed @ MND33-0016 per bottle samples in tact |

W-AD6

White - Lab Yellow - Office Pink - Field

HYDE BROS PRTG CO - MARIETTA, OHIO 45750 380.334-L4

# APPENDIX C

## PRELIMINARY OU3 DATA QUALITY ASSESSMENT AND OU3 DATA VALIDATION RESULTS

## PRELIMINARY OU3 DATA QUALITY ASSESSMENT

Quality assurance is a system of measures taken to ensure that a desired product meets a defined level of quality. A system of quality assurance consists of two elements: quality control and quality assessment. Quality control is a system of procedures performed to control the quality of the product, usually with defined standards of performance for those procedures. Quality assessment is a program of activities to evaluate the performance of implemented quality control procedures and the quality of the product.

Relative to data generated in the OU3 Limited Field Investigation (LFI), the OU3 Quality Assurance Project Plan ([QAPP]; DOE, 1991) prescribed the following quality control measures in order to obtain data of the desired level of quality:

- Field and laboratory analytical methodology.
- Calibration procedures.
- Internal quality control checks.
- Accuracy and precision goals.
- Completeness, representativeness, and comparability goals.

The analytical data can be assessed to determine whether the criteria for the quality control measures were met. The following discusses the assessment procedures.

### Field Laboratory Analytical Methods

The field and laboratory measurements were performed according to the methods specified in the QAPP.

| • Field Measurements | Method |
|---|---|
| Organic vapors | Mound Plant ER Program SOP 6.2 |

(The following additional field measurements were conducted for health and safety purposes and are not discussed in terms of data quality: low energy radiation, alpha scintillation, aerosols, and combustible gas.)

| • Laboratory Measurements | Method |
|---|---|
| Target Compound List – | |
| Volatile organic compounds | CLP SOW 2/88 |
| Semivolatile organic compounds | CLP SOW 2/88 |
| Pesticides/PCBs | EPA method 8080 |
| Target Analyte List – | |
| Metals and cyanide | CLP SOW 3/90 |

## Calibration Procedures and Internal Quality Control Checks

The laboratory calibration procedures and internal quality control checks (e.g., method blanks, matrix spikes, surrogates, etc.) performed for these analyses were assessed as part of the validation performed on these data. Reports of the data validation are presented in following this assessment. Data validation for the Contract Laboratory Program Statement of Work (CLP SOW) analyses was performed according to the U.S. Environmental Protection Agency's (EPA) laboratory data validation procedures (EPA, 1988a; 1988b). Pesticide/PCB results were evaluated using the EPA guidelines; however, the acceptance criteria for quality control checks, such as calibration, specified in the QAPP were implemented.

Internal quality control checks conducted in the field for laboratory measurements (ambient blanks and field duplicates) were collected at the required frequency stated in the QAPP. Results for these checks were within the acceptance criteria established in the QAPP with the exception of some field duplicate results. Field duplicates were collected for sample location 0019. The following constituents exceeded the 35 relative percent difference criteria for sample 0019: calcium, magnesium, manganese, and 2-butanone. Most likely, the variance is due to sample inhomogeneity. Methylene chloride was detected in the ambient blank collected for the site; however, it was qualified in the data validation as "not detected" due to laboratory method blank contamination.

Analytical results were qualified by the validators or were accepted without qualification. The data qualifiers applied to the results are one or more of the following:

- J – Value is considered estimated.
- U – Not detected. Associated numerical value is the sample quantitation limit.

## Accuracy and Precision Goals

Precision and accuracy goals were established in the QAPP in terms of the field and laboratory quality control checks performed (see Tables III.1 and III.2 in the QAPP [DOE, 1991]). The data validation reports discuss whether the specific criteria for the laboratory quality control checks were met. All quality control checks performed for field measurements were met.

## Completeness

Completeness is a measure of the amount of data obtained from a measurement system that achieves the project goals, compared to the amount expected under normal conditions. Completeness is expressed in the QAPP for three activities: the number of samples collected, the number of field measurements made, and the number of "valid" laboratory measurements made. The laboratory measurements completeness goals for sample collection and field measurements are 90% and 95%,

respectively. These completeness goals were designed for the overall OU3 Field Investigation; however, they can also be discussed for the Building 51 tank site. The final completeness goals for the OU3 program will be calculated and reported in the final OU3 investigation report. The completeness of sample collection points for the tank site is 100%; the completeness for field measurements is 100%. The number of "valid" laboratory results compared to the number of results generated are identified by the data validation as those results that are qualified as usable. All laboratory results were deemed usable for closure with the qualifications and therefore, the completeness is 100%.

Representativeness and Comparabilty

As discussed in the QAPP, measures were taken to obtain representative and comparable data such as conducting sample collection using techniques to obtain representative samples and reporting data in comparable measurement units. Numerical goals cannot be applied to representativeness and comparability; however, the measures taken to obtain this aspect of data quality in accordance with the QAPP were performed.

Overall Data Quality Assessment

The overall data quality can be assessed by taking into consideration the results of the control measures discussed above. All the requirements and criteria for these measures were met, with the exceptions discussed in the validation reports for internal laboratory quality control checks. The impact of these exceptions is discussed in the following text.

The semivolatile organic compounds and the pesticide/PCB results were all qualified as "estimated" due to exceeded extraction holding times of 1 to 2 days (semivolatiles) and 4 to 5 days (pesticides/PCBs). Although not quantifiable, the amount of negative bias in the sample results due to the delayed extraction time is considered minimal because the extractions were performed only a few days past the holding time. No target semivolatile organic compounds were detected in the samples with the exception of a few low-level detections of acenaphthene, fluoranthene, butylbenzylphthalate, pyrene, and delta-BHC. These detections are potentially biased low. Semivolatile concentrations in the samples prior to the extraction would have been most likely near the quantitation limits. Negatively biased positive results would have been reported if semivolatile compounds were present at significant levels. A complete degradation or volatilization of semivolatile compounds is not likely to have occurred as only a few days extraction holding time were exceeded for refrigerated samples. The amount of suspected bias in the low-level results for semivolatile organic compounds and pesticide/PCBs is not considered to affect the usability of the results for comparison to closure criteria.

Two volatile organic compounds (VOC) were detected at low levels, and were qualified as "not detected" due to laboratory method blank contamination. Specifically, the acetone result for sample 0016 was qualified as "not detected" and methylene chloride results were similarly qualified for all samples except 0017. The method detection limits as reported by the data validation allow meaningful evaluation of the results against closure criteria, because the criteria are often two to three orders of magnitude greater.

Several metal results were qualified as "estimated" because of problems with one or more of the following: ICP serial dilution, field duplicate results, matrix spike recoveries, post digestion spike, interference check sample, or method of standard addition. The amount of error associated with the results due to these outliers is not considered to affect a comparison of the results to the closure criteria, which are at least an order of magnitude greater. Other metal results were qualified as "not detected" because of calibration blank contamination. The levels at which they were qualified is at least an order of magnitude lower than closure criteria; therefore, the qualifications are not considered to impact the usability of the data.

A full report on the quality of all of the data generated in the OU3 Limited Field Investigation will be presented in the report for the entire investigation, scheduled to be started in Fiscal Year 1994.

## REFERENCES


DOE (Department of Energy). 1991. "Limited Field Investigation Quality Assurance Project Plan, Mound Plant, Miscellaneous Sites, Operable Unit 3." Environmental Restoration Program. U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, NM. October 1991.

EPA (U.S. Environmental Protection Agency). 1988a. "Laboratory Data Validation – Functional Guidelines for Evaluation of Organic Analyses." U.S. Environmental Protection Agency, Hazardous Site Evaluation Division. February 1988.

EPA (U.S. Environmental Protection Agency). 1988b. "Laboratory Data Validation – Functional Guidelines for Evaluation of Inorganics Analyses." U.S. Environmental Protection Agency, Hazardous Site Evaluation Division. July 1, 1988.

# OPERABLE UNIT 3 DATA VALIDATION RESULTS

1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

# REPORT OF DATA VALIDATION RESULTS

PROJECT: LANL Mound PROJECT NUMBER: 27444001

TACK: Operable Unit 3 DATE: February 21, 1992

LABORATORY: IT Analytical Services
LAB BATCH: REA37051
ANALYSIS: Volatile Organic Compounds

## 1. CASE SUMMARY

Eleven soil samples and two trip blanks were collected on August 28,29-91 for volatile organic compounds and were assigned IT Laboratory batch number REA37051. Samples were apparently received by the laboratory in good condition.

Sample analysis was performed according to the USEPA Contract Laboratory Program (CLP 2/88 Organic Statement of Work (SOW) by IT laboratories in Earth City, Missouri. The following samples apply to this data validation report:

Batch REA37051

| | |
|---|---|
| MND33-0016-0001 | MND33-0023-0001 |
| MND33-0017-0001 | MND33-0023-1001 |
| MND33-0018-0001 | MND33-0023-1001MS |
| MND33-0019-0001 | MND33-0023-1001MSD |
| MND33-0019-1001 | MND33-0024-0001 |
| MND33-0020-0001 | MND33-0024-5001 (Trip Blank) |
| MND33-0021-0001 | MND33-0016-5001 (Trip Blank) |
| MND33-0022-0001 | |

## 2. SAMPLE HOLDING TIMES

Samples were analyzed within the required holding time for volatile organic compounds.

Reviewer: Kelly Marie Fowler

## 3. RESULTS OF LABORATORY QUALITY CONTROL CHECKS

### a. GC/MS Tuning

GC/MS complied with the mass and ion abundance criteria for BFB. However, the tune raw data for the initial calibration analyzed on 09-03-91 @ 09:54 (File ID FF175) was missing from the data package. The laboratory has been contacted for resubmission.

### b. Calibration

Initial and continuing calibrations for the analysis were evaluated against the CLP Statement of Work No 2/88 criteria. Results which did not met these criteria are noted in Table 5. Several compounds had the %RSD and/or %D results exceed the 30% and 25% QC limits in the initial and continuing calibrations, respectively. The acetone %D in the continuing calibration on 09-06-91 exceeded 50%. The associated positive result in sample MND-33-0019-1001 is qualified in reference to method blank contamination, no additional qualification is applied to this sample result. The VBLK04 blank result for this compound is considered estimated. All other outliers were below 50%; therefore, only the associated positive results are qualified as estimated. However, the only positive results for these compounds were for acetone and since these results are qualified due to blank contamination, no additional qualification is applied.

### c. Method Blanks

All method blanks contained common contaminants methylene chloride and acetone at levels less than 3x the CRQL. Sample results less than the CRQL are elevated to the CRQL, and results less than 10x the blank levels are flagged "U". All of these results are believed to be artifacts of laboratory contamination, and are considered not detected.

### d. Surrogate Spikes

The 1,2-dichloroethane surrogate recoveries exceeded the QC limit in samples MND33-0023-1001, MS/MSD. This sample was not reanalyzed as a straight sample but rather as the MS/MSD QC analysis. This sample is exhibiting a matrix effect. However, these sample data are considered as estimated due to the surrogate outliers.

Reviewer: Kelly Jean Jacobson

e. Matrix spike and Matrix Spike Duplicates

The RPD result for chlorobenzene exceeded the QC limit in the analysis of sample MND33-0023-1001. This compound was not detected in the unspiked samples; therefore, no qualification is applied on this basis.

f. Internal Standards

All internal standard areas were below the control limits for sample MND33-0023-1001MS, and the chlorobenzene area was below the control limit for sample MND33-0023-1001MSD. This QC sample is exhibiting a matrix effect. These samples have already been qualified due to surrogate outliers, no additional qualification is applied.

g. Compound Identification

The compound identifications were satisfactory for all analyses. Ion intensities in the mass spectra were within the criteria.

h. System Performance

The instrument performance was stable throughout these analyses.

i. Compound Quantitation and Reported Detection Limits

All calculations of the detected compounds were confirmed. The CRQLs were adjusted accordingly.

j. Tentatively Identified Compounds

All criteria were met in the identification of the tentatively identified compounds.

Reviewer: Kelly Marie Jones

## 4. RESULTS OF ASSOCIATED QUALITY CONTROL CHECKS

### a. Field Duplicates

No field duplicate was reported with this data set.

### b. Field Blanks

Two trip blanks are associated with these samples. These samples were analyzed for volatile compounds only, and also contained methylene chloride; however, have already been considered not detected due to the associated method blank contamination.

## 5. OVERALL ASSESSMENT OF THE DATA

Table 6 presents a summary of the sample results, and any qualification that has been described in this report.

Batch REA37051

All data has been accepted within the applied qualifier codes. Positive results have been qualified due to surrogate and internal standard outliers along with calibration outliers in the volatile fraction. Other results have been considered not detected due to blank contamination.

## 6. REFERENCES

EPA, 1988. Contract Laboratory Program 2/88 Organic Statement of Work

EPA, 1988. "Laboratory Data Validation - Functional Guidelines for Evaluation of Organic Analyses," U.S. Environmental Protection Agency, Hazardous Site Evaluation Division. February 1988.

Reviewer: Kelly Mann Fuller

REPORT OF DATA VALIDATION RESULTS LAB BATCH: REA37051

ATTACHMENTS

TABLE 1 - EXCEEDED HOLDING TIME
TABLE 2 - SURROGATE RECOVERY OUTLIERS
TABLE 3 - MATRIX SPIKE RECOVERY OUTLIERS
TABLE 4 - METHOD BLANK OUTLIERS
TABLE 5 - CALIBRATION OUTLIERS
TABLE 6 - QUALIFIED DATA SUMMARY TABLE

# EXCEEDED HOLDING TIMES
# VOLATILE ORGANIC COMPOUNDS
# CLP SOW – 2/88

PREPARED BY: Kelly Spittler

DATE: 12-16-91

LANL MOUND PROJECT

LABORATORY BATCH # REA 37051

OPERABLE UNIT NO.:

LABORATORY NAME/LOCATION: TAS - St. Louis

COLLECTION DATE(s): [illegible]

| LABORATORY SAMPLE ID | MOUND SAMPLE ID | DATE COLLECTED | DATE EXTRACTED | DATE ANALYZED | NUMBER OF DAYS PAST HOLDING TIME |
|---|---|---|---|---|---|
| All within holding time | | | | | |
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# SURROGATE RECOVERY OUTLIERS
# VOLATILE ORGANIC COMPOUNDS
# CLP SOW – 2/88

PREPARED BY: Kelly Scittler

DATE: 12 16 91

LABORATORY BATCH #: KKH37051

LABORATORY NAME/LOCATION: LTAS - St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: _____

COLLECTION DATE(s): 08-28-09-91

**SOIL QC LIMITS**
TOLUENE-d8 (81–117%)
4-BROMO-FLUOROBENZENE (74–121%)
1,2-DICHLOROETHANE-d4 (70–121%)

**WATER QC LIMITS**
TOLUENE-d8 (88–110%)
4-BROMO-FLUOROBENZENE (86–115%)
1,2-DICHLOROETHANE-d4 (76–114%)

| LABORATORY SAMPLE ID | MOUND SAMPLE ID | SAMPLE MATRIX | TOLUENE-d8 | 4-BROMO-FLUOROBENZENE | 1,2-DICHLOROETHANE-d4 |
|---|---|---|---|---|---|
| 1530-010 | (MND 33-) 0023-1001 | Soil | | | 124 |
| 1530-010 MS | 0023-1001 MS | Soil | | | 124 |
| 1530-010 MSD | 0023-1001 MSD | Soil | | | 123 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

# MATRIX SPIKE RECOVERY OUTLIERS
# VOLATILE ORGANIC COMPOUNDS
# CLP SOW – 2/88

PREPARED BY: Kelly Spitler

DATE: 12-16-91

LABORATORY BATCH #: KEA37051

LABORATORY NAME/LOCATION: ITAS - St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: _____

COLLECTION DATE(s): 11-25-29-91

**SOIL QC LIMITS**
1,1-DCE (59-172%)
TRICHLOROETHENE (62-137%)
BENZENE (66-142%)
TOLUENE-D8 (59-139%)
CHLOROBENZENE (60-133%)

**WATER QC LIMITS**
1,1-DCE (61-145%)
TRICHLOROETHENE (71-120%)
BENZENE (76-127%)
TOLUENE-D8 (76-125%)
CHLOROBENZENE (75-130%)

| LABORATORY SAMPLE ID | MOUND SAMPLE ID (MND 33) | SAMPLE MATRIX | 1,1-DCE | TRICHLOROETHENE | BENZENE | TOLUENE | ATD CHLOROBENZENE |
|---|---|---|---|---|---|---|---|
| 1530 C10 | 0023-1001 | Soil | | | | | 24 |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
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| | | | | | | | |

# METHOD BLANK OUTLIERS
# VOLATILE ORGANIC COMPOUNDS
# CLP SOW – 2/88

PREPARED BY: Kelly Spittler

DATE: 6-91

LANL MOUND PROJECT

LABORATORY BATCH #: RKA 3 2051

OPERABLE UNIT NO.:

LABORATORY NAME/LOCATION: ITAS - St. Louis

COLLECTION DATE(s): 05-30, 29-91

APPLIES TO SAMPLES:

1530-005 (MN033-0019-1001)

| LABORATORY SAMPLE ID | Methylene Chloride | Acetone | | |
|---|---|---|---|---|
| VBLK04 | 2 J | 19 | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# METHOD BLANK OUTLIERS
# VOLATILE ORGANIC COMPOUNDS
# CLP SOW – 2/88

PREPARED BY: Kelly Spittler

DATE: 12-16-91

LANL MOUND PROJECT

LABORATORY BATCH #: KEA37C51

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITAS – St. Louis

COLLECTION DATE(s): 08-01-07-91

APPLIES TO SAMPLES:

1530-004 (MND-330019-0001)

1530-007 (MND-33-0021-0001)

1530-008 (MND-33-0022-0001)

1530-009 (MND-33-0023-0001)

1530-011 (MND-33-0024-0001)

1530-010 MSD (MND-33-0023-1001 MSD)

| LABORATORY SAMPLE ID | Methylene Chloride | Acetone | | |
|---|---|---|---|---|
| VBLK03 | 2 J | 14 | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# METHOD BLANK OUTLIERS
# VOLATILE ORGANIC COMPOUNDS
# CLP SOW – 2/88

PREPARED BY: Kelly Spittler

DATE: [illegible]

LANL MOUND PROJECT

LABORATORY BATCH #: RFA 37051

OPERABLE UNIT NO.:

LABORATORY NAME/LOCATION: L-TAS - St Louis

COLLECTION DATE(s): [illegible]

APPLIES TO SAMPLES:

[illegible] (MND33-0016-5001)

[illegible] (MND33-0024-5001)

| LABORATORY SAMPLE ID | Methylene Chloride | Acetone | | |
|---|---|---|---|---|
| L3EK01 | 8 | 12 | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# METHOD BLANK OUTLIERS
# VOLATILE ORGANIC COMPOUNDS
# CLP SOW – 2/88

PREPARED BY: Kelly Spittler

DATE: 12-16-91

LABORATORY BATCH #: REA 5[illegible]51

LABORATORY NAME/LOCATION: ITAS - St Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.:

COLLECTION DATE(s): 11-21, 22-91

APPLIES TO SAMPLES:

1530-001 (MND33-0016-0001)

1530-002 (MND33-0017-0001)

1530-003 (MND33-0018-0001)

1530-006 (MND33-0020-0001)

1530-010 (MND33-0023-1001)

1530-010MS (MND33-0023-1001MS)

| LABORATORY SAMPLE ID | Methylene Chloride | Acetone | | |
|---|---|---|---|---|
| VBLK02 | 2J | 19 | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# CALIBRATION OUTLIERS
# VOLATILE TCL COMPOUNDS
# CLP SOW – 2/88

REPARED BY: Kelly Spittler

DATE: [illegible]

LANL MOUND PROJECT

ABORATORY BATCH #: [illegible]

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITAS - St. Louis

COLLECTION DATE(s): 08-28, 29-91

REPARATION BLANK MATRIX (SOIL/WATER): Soil

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): ug/kg

| INSTRUMENT # M.S.E | INIT. CAL. | | | CONT. CAL. | | | CONT. CAL. | | | CONT. CAL. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE/TIME: | 09-03-91/17:06 | | | 09-04-91/8:46 | | | 09-05-91/8:20 | | | 09-06-91/8:05 | | |
| | RF | %RSD | * | RF | %D | * | RF | %D | * | RF | %D | * |
| CHLOROMETHANE | | | | | | | | | | | | |
| BROMOMETHANE | | | | | | | | | | | | |
| VINYL CHLORIDE | | | | | | | | | | | | |
| CHLOROETHANE | | | | | | | | | | | | |
| METHYLENE CHLORIDE | | | | | | | | | | | | |
| ACETONE | | 36 | | | | | | | | | -56.2 | |
| CARBON DISULFIDE | | | | | | | | | | | | |
| 1,1-DICHLOROETHENE | | | | | | | | | | | | |
| 1,1-DICHLOROETHANE | | | | | | | | | | | | |
| 1,2-DICHLOROETHANE(TOTAL) | | | | | | | | | | | | |
| CHLOROFORM | | | | | | | | | | | | |
| 1,2-DICHLOROETHANE | | | | | | | | | | | | |
| 2-BUTANONE | | | | | | | | | | | | |
| 1,1,1,-TRICHLOROETHANE | | | | | | | | | | | | |
| CARBON TETRACHLORIDE | | | | | | | | | | | | |
| VINYL ACETATE | | | | | | | | | | | | |
| BROMODICHLOROMETHANE | | | | | | | | | | | | |
| 1,2-DICHLOROPROPANE | | | | | | | | | | | | |
| CIS-1,3-DICHLOROPROPENE | | | | | | | | | | | | |
| TRICHLOROETHENE | | | | | | | | | | | | |
| DIBROMOCHLOROMETHANE | | | | | | | | | | | | |
| 1,1,2-TRICHLOROETHANE | | | | | | | | | | | | |
| BENZENE | | | | | | | | | | | | |
| TRANS-1,3-DICHLOROPROPENE | | | | | | | | | | | | |
| BROMOFORM | | | | | | | | | | | | |
| AFFECTED SAMPLES: | ALL LISTED TO | | | VBLK62 (MND33-) 0016-0001 | | | VBLK03 (MND33-) 0019-0001 | | | (MND-33) VBLK04 | | |
| | RIGHT | | | 0017-0001 | | | 0021-0001 | | | | | |
| | | | | 0018-0001 | | | 0022-0001 | | | 0019-1001 | | |
| | | | | 0025-0001 | | | 0023-0001 | | | | | |
| | | | | 0023-1001 | | | 0023-1001 MSD | | | | | |
| | | | | 0023-1001 MS | | | 0024-0001 | | | | | |

REVIEWER INITIALS: [illegible]

DATE: [illegible]

* THESE FLAGS SHOULD BE APPLIED TO THE ANALYTES ON THE SAMPLE DATA SHEETS.

# CALIBRATION OUTLIERS
# VOLATILE TCL COMPOUNDS
# CLP SOW – 2/88

LABORATORY BATCH #: REC 5 [illegible]

COLLECTION DATE(s): [illegible]

| INSTRUMENT # MSC | INIT. CAL. | | | CONT. CAL. | | | CONT. CAL. | | | CONT. CAL. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE/TIME: | 09-03-91/17:06 | | | 09-04-91/[illegible] | | | 09-05-91/8:2[illegible] | | | 09-06-91/19:15 | | |
| | RF | %RSD | * | RF | %D | * | RF | %D | * | RF | %D | * |
| 4-METHYL-2-PENTANONE | | | | | | | | | | | | |
| 2-HEXANONE | | | | | | | | | | | | |
| TETRACHLOROETHENE | | | | | | | | | | | | |
| 1,1,2,2-TETRACHLOROETHANE | | | | | | | | | | | | |
| TOLUENE | | | | | | | | | | | | |
| CHLOROBENZENE | | | | | | | | | | | | |
| ETHYLBENZENE | | | | | | | | | | | | |
| STYRENE | | | | | | | | | | | | |
| XYLENE (TOTAL) | | | | | | | | | | | | |

| AFFECTED SAMPLES: | | | |
|---|---|---|---|
| | ALL LISILD 78 | VBLK02 (MND 35-) 0016-0001 | VBLK03 (MND 35-) 0019-0001 | (MND 35-) VBLK4 |
| | RIGHT | 0017-0001<br>0018-0001 | 0021-0001<br>0022-0001 | 0017-1001 |
| | | 0020-0001<br>0023-0001 | 0023-0001<br>0023-1001 MSD | |
| | | 0023-1001 MS | 0024-0001 | |

REVIEWER INITIALS: KWS

DATE: 12-16-91

* THESE FLAGS SHOULD BE APPLIED TO THE ANALYTES ON THE SAMPLE DATA SHEETS.

# CALIBRATION OUTLIERS
# VOLATILE TCL COMPOUNDS
# CLP SOW – 2/88

PREPARED BY: [illegible]

DATE: [illegible]

LANL MOUND PROJECT

LABORATORY BATCH #: [illegible]

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITA – St Louis

COLLECTION DATE(s): 08-25, 29-91

PREPARATION BLANK MATRIX (SOIL/WATER): Water

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): ug/L

| INSTRUMENT # MSF DATE/TIME: | INIT. CAL. 09-03-91/16:48 | | | CONT. CAL. 09-04-91/11:41 | | | CONT. CAL. | | | CONT. CAL. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RF | %RSD | * | RF | %D | * | RF | %D | * | RF | %D | * |
| CHLOROMETHANE | | | | | | | | | | | | |
| BROMOMETHANE | | | | | | | | | | | | |
| VINYL CHLORIDE | | | | | | | | | | | | |
| CHLOROETHANE | | | | | | | | | | | | |
| METHYLENE CHLORIDE | | | | | | | | | | | | |
| ACETONE | | | | | | | | | | | | |
| CARBON DISULFIDE | | | | | | | | | | | | |
| 1,1-DICHLOROETHENE | | | | | | | | | | | | |
| 1,1-DICHLOROETHANE | | | | | | | | | | | | |
| 1,2-DICHLOROETHANE(TOTAL) | | | | | | | | | | | | |
| CHLOROFORM | | | | | | | | | | | | |
| 1,2-DICHLOROETHANE | | | | | | | | | | | | |
| 2-BUTANONE | | 38.9 | | | -25.3 | | | | | | | |
| 1,1,1,-TRICHLOROETHANE | | | | | | | | | | | | |
| CARBON TETRACHLORIDE | | | | | | | | | | | | |
| VINYL ACETATE | | | | | | | | | | | | |
| BROMODICHLOROMETHANE | | | | | | | | | | | | |
| 1,2-DICHLOROPROPANE | | | | | | | | | | | | |
| CIS-1,3-DICHLOROPROPENE | | | | | | | | | | | | |
| TRICHLOROETHENE | | | | | | | | | | | | |
| DIBROMOCHLOROMETHANE | | | | | | | | | | | | |
| 1,1,2-TRICHLOROETHANE | | | | | | | | | | | | |
| BENZENE | | | | | | | | | | | | |
| TRANS-1,3-DICHLOROPROPENE | | | | | | | | | | | | |
| BROMOFORM | | | | | | | | | | | | |

AFFECTED SAMPLES:

| | | | |
|---|---|---|---|
| [illegible] | [illegible] | (MND 53-1) | |
| [illegible] | 0024-5001 | | |
| | 0016-[illegible]001 | | |

REVIEWER INITIALS: KMS

DATE: 12-16-91

* THESE FLAGS SHOULD BE APPLIED TO THE ANALYTES ON THE SAMPLE DATA SHEETS.

# CALIBRATION OUTLIERS
# VOLATILE TCL COMPOUNDS
# CLP SOW – 2/88

ABORATORY BATCH #: REP 37051 COLLECTION DATE(s): 09-03-91

| NSTRUMENT # MSF<br>DATE/TIME: | INIT. CAL. | | | CONT. CAL. | | | CONT. CAL. | | | CONT. CAL. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 09-03-91/16:46 | | | 09-04-91/11:41 | | | | | | | | |
| | RF | %RSD | * | RF | %D | * | RF | %D | * | RF | %D | * |
| -METHYL-2-PENTANONE | | | | | | | | | | | | |
| 2-HEXANONE | | | | | | | | | | | | |
| TETRACHLOROETHENE | | | | | | | | | | | | |
| ,1,2,2-TETRACHLOROETHANE | | | | | 26.6 | | | | | | | |
| TOLUENE | | | | | | | | | | | | |
| CHLOROBENZENE | | | | | | | | | | | | |
| ETHYLBENZENE | | | | | | | | | | | | |
| STYRENE | | | | | | | | | | | | |
| YLENE (TOTAL) | | | | | | | | | | | | |

| AFFECTED SAMPLES: | | |
|---|---|---|
| | ALL LISTED TO | (MND 55-) VBLK01 |
| | RIGHT | 0024-5001 |
| | | 0016-5001 |

REVIEWER INITIALS: KMS

DATE: 12-16-91

* THESE FLAGS SHOULD BE APPLIED TO THE ANALYTES ON THE SAMPLE DATA SHEETS.

# QUALIFIED DATA SUMMARY TABLE
# VOLATILE ORGANIC COMPOUNDS

PREPARED BY: H. Seeley

DATE: 3/7/92

LANL MOUND PROJECT

LABORATORY BATCH #: KEA 37051

OPERABLE UNIT NO.: 3

LABORATORY NAME/LOCATION: ITAS - St. Louis

COLLECTION DATE(s): 8/28-29/92

| ANALYTE | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID |
|---|---|---|---|---|
| | MW033-0016-0001 | MW033-0016-5001 | MW033-0017-0001 | MW033-0018-0001 |
| CHLOROMETHANE | | | | |
| BROMOMETHANE | | | | |
| VINYL CHLORIDE | | | | |
| CHLOROETHANE | | | | |
| METHYLENE CHLORIDE | 6 U | 7 U | | 6 U |
| ACETONE | 69 U | | 240 | 250 |
| CARBON DISULFIDE | | | | |
| 1,1-DICHLOROETHENE | | | | |
| 1,1-DICHLOROETHANE | | | | |
| 1,2-DICHLOROETHANE(TOTAL) | | | | |
| CHLOROFORM | | | | |
| 1,2-DICHLOROETHANE | | | | |
| 2-BUTANONE | | | | |
| 1,1,1,-TRICHLOROETHANE | | | | |
| CARBON TETRACHLORIDE | | | | |
| VINYL ACETATE | | | | |
| BROMODICHLOROMETHANE | | | | |
| 1,2-DICHLOROPROPANE | | | | |
| CIS-1,3-DICHLOROPROPENE | | | | |
| TRICHLOROETHENE | | | | |
| DIBROMOCHLOROMETHANE | | | | |
| 1,1,2-TRICHLOROETHANE | | | | |
| BENZENE | | | | |
| TRANS-1,3-DICHLOROPROPENE | | | | |
| BROMOFORM | | | | |
| 4-METHYL-2-PENTANONE | | | | |
| 2-HEXANONE | | | | |
| TETRACHLOROETHENE | | | | |
| 1,1,2,2-TETRACHLOROETHANE | | | | |
| TOLUENE | | | | |
| CHLOROBENZENE | | | | |
| ETHYLBENZENE | | | | |
| STYRENE | | | | |
| XYLENE (TOTAL) | | | | |

REVIEWER INITIALS:_____

DATE:_____

# QUALIFIED DATA SUMMARY TABLE
# VOLATILE ORGANIC COMPOUNDS

PREPARED BY: H. Serley

DATE: 3/3/92

LABORATORY BATCH #: RCA 37051

LABORATORY NAME/LOCATION: FTS-St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATE(s): 5/28, 29/92

| ANALYTE | MOUND SAMPLE ID MW033-0019-0001 | MOUND SAMPLE ID MW033-0019-1001 | MOUND SAMPLE ID MW033-0020-0001 | MOUND SAMPLE ID MW033-0021-0001 |
|---|---|---|---|---|
| CHLOROMETHANE | | | | |
| BROMOMETHANE | | | | |
| VINYL CHLORIDE | | | | |
| CHLOROETHANE | | | | |
| METHYLENE CHLORIDE | 6 U | 6 U | 6 U | 5 U |
| ACETONE | | 140 U | 27 U | 29 U |
| CARBON DISULFIDE | | | | |
| 1,1-DICHLOROETHENE | | | | |
| 1,1-DICHLOROETHANE | | | | |
| 1,2-DICHLOROETHANE(TOTAL) | | | | |
| CHLOROFORM | | | | |
| 1,2-DICHLOROETHANE | | | | |
| 2-BUTANONE | | | | |
| 1,1,1,-TRICHLOROETHANE | | | | |
| CARBON TETRACHLORIDE | | | | |
| VINYL ACETATE | | | | |
| BROMODICHLOROMETHANE | | | | |
| 1,2-DICHLOROPROPANE | | | | |
| CIS-1,3-DICHLOROPROPENE | | | | |
| TRICHLOROETHENE | | | | |
| DIBROMOCHLOROMETHANE | | | | |
| 1,1,2-TRICHLOROETHANE | | | | |
| BENZENE | | | | |
| TRANS-1,3-DICHLOROPROPENE | | | | |
| BROMOFORM | | | | |
| 4-METHYL-2-PENTANONE | | | | |
| 2-HEXANONE | | | | |
| TETRACHLOROETHENE | | | | |
| 1,1,2,2-TETRACHLOROETHANE | | | | |
| TOLUENE | | | | |
| CHLOROBENZENE | | | | |
| ETHYLBENZENE | | | | |
| STYRENE | | | | |
| XYLENE (TOTAL) | | | | |

REVIEWER INITIALS:_____

DATE:_____

# QUALIFIED DATA SUMMARY TABLE
# VOLATILE ORGANIC COMPOUNDS

PREPARED BY: H. Seeley

DATE: 3/3/92

LABORATORY BATCH #: RQA 37051

LABORATORY NAME/LOCATION: IT-St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATE(s): 8/28, 29/92

| ANALYTE | MOUND SAMPLE ID MW033-0022-0001 | MOUND SAMPLE ID MW033-0023-0001 | MOUND SAMPLE ID MW033-0023-1001 | MOUND SAMPLE ID MW033-0024-0001 |
|---|---|---|---|---|
| CHLOROMETHANE | | | 12 UJ | |
| BROMOMETHANE | | | 12 UJ | |
| VINYL CHLORIDE | | | 12 UJ | |
| CHLOROETHANE | | | 12 UJ | |
| METHYLENE CHLORIDE | 6 U | 6 U | 8 UJ | 5 U |
| ACETONE | 24 U | 26 U | 21 UJ | 19 U |
| CARBON DISULFIDE | | | 6 UJ | |
| 1,1-DICHLOROETHENE | | | 6 UJ | |
| 1,1-DICHLOROETHANE | | | 6 UJ | |
| 1,2-DICHLOROETHANE(TOTAL) | | | 6 UJ | |
| CHLOROFORM | | | 6 UJ | |
| 1,2-DICHLOROETHANE | | | 6 UJ | |
| 2-BUTANONE | | | 12 UJ | |
| 1,1,1,-TRICHLOROETHANE | | | 6 UJ | |
| CARBON TETRACHLORIDE | | | 6 UJ | |
| VINYL ACETATE | | | 12 UJ | |
| BROMODICHLOROMETHANE | | | 6 UJ | |
| 1,2-DICHLOROPROPANE | | | 6 UJ | |
| CIS-1,3-DICHLOROPROPENE | | | 6 UJ | |
| TRICHLOROETHENE | | | 6 UJ | |
| DIBROMOCHLOROMETHANE | | | 6 UJ | |
| 1,1,2-TRICHLOROETHANE | | | 6 UJ | |
| BENZENE | | | 6 UJ | |
| TRANS-1,3-DICHLOROPROPENE | | | 6 UJ | |
| BROMOFORM | | | 6 UJ | |
| 4-METHYL-2-PENTANONE | | | 12 UJ | |
| 2-HEXANONE | | | 12 UJ | |
| TETRACHLOROETHENE | | | 6 UJ | |
| 1,1,2,2-TETRACHLOROETHANE | | | 6 UJ | |
| TOLUENE | | | 6 UJ | |
| CHLOROBENZENE | | | 6 UJ | |
| ETHYLBENZENE | | | 6 UJ | |
| STYRENE | | | 6 UJ | |
| XYLENE (TOTAL) | | | 6 UJ | |

REVIEWER INITIALS: _____

DATE: _____

# QUALIFIED DATA SUMMARY TABLE
# VOLATILE ORGANIC COMPOUNDS

PREPARED BY: H. Seeley

DATE: 3/3/12

LANL MOUND PROJECT

LABORATORY BATCH #: RCA 37051

OPERABLE UNIT NO.: 3

LABORATORY NAME/LOCATION: ZRB-St. Louis

COLLECTION DATE(s): 8/28, 29/12

| ANALYTE | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID |
|---|---|---|---|---|
| | MW033 0024-5001 | | | |
| CHLOROMETHANE | | | | |
| BROMOMETHANE | | | | |
| VINYL CHLORIDE | | | | |
| CHLOROETHANE | | | | |
| METHYLENE CHLORIDE | 6 U | | | |
| ACETONE | | | | |
| CARBON DISULFIDE | | | | |
| 1,1-DICHLOROETHENE | | | | |
| 1,1-DICHLOROETHANE | | | | |
| 1,2-DICHLOROETHANE(TOTAL) | | | | |
| CHLOROFORM | | | | |
| 1,2-DICHLOROETHANE | | | | |
| 2-BUTANONE | | | | |
| 1,1,1,-TRICHLOROETHANE | | | | |
| CARBON TETRACHLORIDE | | | | |
| VINYL ACETATE | | | | |
| BROMODICHLOROMETHANE | | | | |
| 1,2-DICHLOROPROPANE | | | | |
| CIS-1,3-DICHLOROPROPENE | | | | |
| TRICHLOROETHENE | | | | |
| DIBROMOCHLOROMETHANE | | | | |
| 1,1,2-TRICHLOROETHANE | | | | |
| BENZENE | | | | |
| TRANS-1,3-DICHLOROPROPENE | | | | |
| BROMOFORM | | | | |
| 4-METHYL-2-PENTANONE | | | | |
| 2-HEXANONE | | | | |
| TETRACHLOROETHENE | | | | |
| 1,1,2,2-TETRACHLOROETHANE | | | | |
| TOLUENE | | | | |
| CHLOROBENZENE | | | | |
| ETHYLBENZENE | | | | |
| STYRENE | | | | |
| XYLENE (TOTAL) | | | | |

REVIEWER INITIALS: _____

DATE: _____

WESTON
MANAGERS DESIGNERS CONSULTANTS

1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

# REPORT OF DATA VALIDATION RESULTS

PROJECT: LANL Mound PROJECT NUMBER: 27444001

TACK: Operable Unit 3 DATE: February 21, 1992

LABORATORY: IT Analytical Services
LAB BATCH: REA37051
ANALYSIS: Semivolatile Organic Compounds

## 1. CASE SUMMARY

Eleven soil samples were collected on August 28,29-91 for semivolatile organic compounds and were assigned IT Laboratory batch number REA37051. Samples were apparently received by the laboratory in good condition.

Sample analysis was performed according to the USEPA Contract Laboratory Program (CLP 2/88 Organic Statement of Work (SOW) by IT laboratories in Earth City, Missouri. The following samples apply to this data validation report:

Batch REA37051

MND33-0016-0001
MND33-0017-0001
MND33-0018-0001
MND33-0019-0001
MND33-0019-1001
MND33-0020-0001
MND33-0021-0001
MND33-0022-0001
MND33-0023-0001
MND33-0023-1001
MND33-0023-1001MS
MND33-0023-1001MSD
MND33-0024-0001

## 2. SAMPLE HOLDING TIMES

All sample analyses exceeded the 7 day EPA extraction holding time requirement from 1 to 2 days. Therefore, all sample data is considered as estimated.

Reviewer: Kelly Mim Gartti

## 3. RESULTS OF LABORATORY QUALITY CONTROL CHECKS

### a. GC/MS Tuning

GC/MS complied with the mass and ion abundance criteria for DFTPP.

### b. Calibration

The calibrations were evaluated against the CLP-SOW. All %RSD and %D criteria were met for the initial and continuing calibrations. No qualification is applied; however, the calibration information is summarized in Table 5.

### c. Method Blanks

The method blank contained common phthalates (diethylphthalate and bis(2-ethylhexyl)phthalate) at levels less than the CRQL. The samples contained similar contamination at levels less than the CRQL. Therefore, these results are elevated to the CRQL, flagged "U," and considered not detected because they are believed to be artifacts of laboratory contamination.

### d. Surrogate Spikes

All surrogate recoveries were within the CLP - SOW QC limits.

### e. Matrix spike and Matrix Spike Duplicates

All spike recoveries were within the QC criteria established in the CLP-SOW.

### f. Internal Standards

All internal standard areas were within the established control limits.

Reviewer: Kelly Marie Spotts

g. Compound Identification

The compound identifications were satisfactory for all analyses. Ion intensities in the mass spectra were within the criteria.

h. System Performance

The instrument performance was stable throughout these analyses.

i. Compound Quantitation and Reported Detection Limits

All calculations of the detected compounds were confirmed. The CRQLs were adjusted accordingly.

j. Tentatively Identified Compounds

All criteria were met in the identification of the tentatively identified compounds.

4. **RESULTS OF ASSOCIATED QUALITY CONTROL CHECKS**

a. Field Duplicates

No field duplicate analysis was reported with this data set.

b. Field Blanks

No field blanks analyses were reported with this data set.

Reviewer: Kelly Marie Fontti

## 5. OVERALL ASSESSMENT OF THE DATA

Table 6 presents a summary of the sample results, and any qualification that has been described in this report.

Batch REA37051

All data has been accepted within the applied qualifier codes. Positive results have been qualified due to exceeded holding time and blank contamination in the semivolatile fraction.

## 6. REFERENCES

EPA, 1988. Contract Laboratory Program 2/88 Organic Statement of Work

EPA, 1988. "Laboratory Data Validation - Functional Guidelines for Evaluation of Organic Analyses," U.S. Environmental Protection Agency, Hazardous Site Evaluation Division. February 1988.

Reviewer: _____

REPORT OF DATA VALIDATION RESULTS LAB BATCH: REA37051

ATTACHMENTS

TABLE 1 - EXCEEDED HOLDING TIME
TABLE 2 - SURROGATE RECOVERY OUTLIERS
TABLE 3 - MATRIX SPIKE RECOVERY OUTLIERS
TABLE 4 - METHOD BLANK OUTLIERS
TABLE 5 - CALIBRATION OUTLIERS
TABLE 6 - QUALIFIED DATA SUMMARY TABLE

# EXCEEDED HOLDING TIMES
# SEMIVOLATILE ORGANIC COMPOUNDS
# CLP SOW – 2/88

PREPARED BY: Kelly Spittler

DATE: 12-16-91

LABORATORY BATCH # REA 37051

LABORATORY NAME/LOCATION: ITAS - St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.:

COLLECTION DATE(s): 08-28-29-91

| LABORATORY SAMPLE ID | MOUND SAMPLE ID (MND33-) | DATE COLLECTED | DATE EXTRACTED | DATE ANALYZED | NUMBER OF DAYS PAST HOLDING TIME |
|---|---|---|---|---|---|
| 1530-001 | 0016-0001 | 08-28-91 | 09-06-91 | 09-13-91 | 2 |
| 1530-002 | 0017-0001 | | | | 2 |
| 1530-003 | 0018-0001 | | | | 2 |
| 1530-004 | 0019-0001 | | | | 2 |
| 1530-005 | 0019-1001 | | | | 2 |
| 1530-006 | 0020-0001 | 08-29-91 | | | 1 |
| 1530-007 | 0021-0001 | | | | 1 |
| 1530-008 | 0022-0001 | | | | 1 |
| 1530-009 | 0023-0001 | | | 09-15-91 | 1 |
| 1530-010 | 0023-1001 | | | | 1 |
| 1530-011 | 0024-0001 | | | | 1 |
| 1530-010MS | 0023-1001MS | | | | 1 |
| 1530-010MSD | 0023-1001MSD | | | | 1 |

# SURROGATE RECOVERY OUTLIERS
# SEMIVOLATILE ORGANIC COMPOUNDS
# CLP SOW – 2/88

PREPARED BY: Kelly Spittler

DATE: 12-16-91

LABORATORY BATCH #: REA 37051

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITAS - St. Louis

COLLECTION DATE(s): 08-28-27-91

**SOIL QC LIMITS**
NITROBENZENE-d5 (NBZ) (23-120%)
2-FLUOROBIPHENYL (FBP) (30-115%)
P-TERPHENYL-d14 (TPH) (18-137%)
PHENOL-d5 (PHL) (24-113%)
2-FLUOROPHENOL (2FP) (25-121%)
2,4,6-TRIBROMOPHENOL (TBP) (19-122%)

**WATER QC LIMITS**
NITROBENZENE-d5 (NBZ) (35-114%)
2-FLUOROBIPHENYL (FBP) (43-116%)
P-TERPHENYL-d14 (TPH) (33-141%)
PHENOL-d5 (PHL) (10-94%)
2-FLUOROPHENOL (2FP) (21-100%)
2,4,6-TRIBROMOPHENOL (TBP) (10-123%)

| LABORATORY SAMPLE ID | MOUND SAMPLE ID | SAMPLE MATRIX | NBZ | FBP | TPH | PHL | 2FP | TBP |
|---|---|---|---|---|---|---|---|---|
| All surrogates within limits | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

# MATRIX SPIKE RECOVERY OUTLIERS
# SEMIVOLATILE ORGANIC COMPOUNDS
# CLP SOW – 2/88



PREPARED BY: Kelly Spittler

DATE: 12-16-91

LABORATORY BATCH #: RKA 37051

LABORATORY NAME/LOCATION: _____

LANL MOUND PROJECT

OPERABLE UNIT NO.: _____

COLLECTION DATE(s): 12-28 27-91

**SOIL QC LIMITS**
PHENOL (26–90%)
2-CHLOROPHENOL (25–102%)
1,4-DICHLOROBENZENE (28–104%)
N-NITROSO-DI-N-PROPYLAMINE (41–126%)
1,2,4-TRICHLOROBENZENE (38–107%)
4-CHLORO-3-METHYLPHENOL (26–103%)
ACENAPHTHENE (31–137%)
4-NITROPHENOL (11–114%)
2,4-DINITROTOLUENE (28–89%)
PENTACHLOROPHENOL (17–109%)
PRYENE (35–142%)

**WATER QC LIMITS**
PHENOL (12–89%)
2-CHLOROPHENOL (27–123%)
1,4-DICHLOROBENZENE (36–97%)
N-NITROSO-DI-N-PROPYLAMINE (41–116%)
1,2,4-TRICHLOROBENZENE (39–98%)
4-CHLORO-3-METHYLPHENOL (23–97%)
ACENAPHTHENE (46–118%)
4-NITROPHENOL (10–80%)
2,4-DINITROTOLUENE (24–96%)
PENTACHLOROPHENOL (9–103%)
PRYENE (26–127%)

| LABORATORY SAMPLE ID | MOUND SAMPLE ID | SAMPLE MATRIX | PHENOL | 2-CHLORO PHENOL | 1,4-DI CHLOROBENZENE | N-NITROSO-DI-N-PROPLYAMINE | 1,2,4-TRI CHLOROBENZENE |
|---|---|---|---|---|---|---|---|
| All spiked within criteria | | | | | | | |

# MATRIX SPIKE RECOVERY OUTLIERS
# SEMIVOLATILE ORGANIC COMPOUNDS
# CLP SOW – 2/88



SOIL QC LIMITS
PHENOL (26–90%)
2-CHLOROPHENOL (25–102%)
1,4-DICHLOROBENZENE (28–104%)
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WATER QC LIMITS
PHENOL (12–89%)
2-CHLOROPHENOL (27–123%)
1,4-DICHLOROBENZENE (36–97%)
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4-NITROPHENOL (10–80%)
2,4-DINITROTOLUENE (24–96%)
PENTACHLOROPHENOL (9–103%)
PRYENE (26–127%)

| LABORATORY SAMPLE ID | MOUND SAMPLE ID | SAMPLE MATRIX | ACEN APHTHENE | 4-NITRO PHENOL | 2,4-DI CHLOROTOLUENE | PENTA CHLOROPHENOL | PYRENE |
|---|---|---|---|---|---|---|---|
| All spikes within criteria | | | | | | | |

# METHOD BLANK OUTLIERS
# SEMIVOLATILE ORGANIC COMPOUNDS
# CLP SOW – 2/88

PREPARED BY: Kelly Spittler

DATE: 12-16-91

LANL MOUND PROJECT

LABORATORY BATCH #: REA 37051

OPERABLE UNIT NO.:

LABORATORY NAME/LOCATION: ITAS - St Louis

COLLECTION DATE(s): 8-28-91 - 9/

APPLIES TO SAMPLES:
(MVP 33-)

| | | |
|---|---|---|
| 0016-0001 | 0021-0001 | 0022-1001MSD |
| 0017-0001 | 0022-0001 | |
| 0018-0001 | 0023-0001 | |
| 0019-0001 | 0023-1001 | |
| 0019-1001 | 0024-0001 | |
| 0020-0001 | 0023-1001MS | |

| LABORATORY SAMPLE ID | Diethylphthalate | Bis(2-ethylhexyl)phthalate | | |
|---|---|---|---|---|
| SBLK01 | 170 J | 130 J | | |

# CALIBRATION OUTLIERS
# SEMIVOLATILE TCL COMPOUNDS
# CLP SOW – 2/88

PREPARED BY: Kelly Spitler

DATE: 12-16-91

LANL MOUND PROJECT

LABORATORY BATCH #: REA 37051

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITAS - St Louis

COLLECTION DATE(s): 08-28 29-91

PREPARATION BLANK MATRIX (SOIL/WATER): Soil

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): ug/kg

| INSTRUMENT # MSA DATE/TIME: | INIT. CAL. 09-13-91/10:06 | | | CONT. CAL. 09-15-91/15:12 | | | CONT. CAL. | | | CONT. CAL. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RF | %RSD | * | RF | %D | * | RF | %D | * | RF | %D | * |
| PHENOL | | | | | | | | | | | | |
| BIS(2-CHLOROETHYL)ETHER | | | | | | | | | | | | |
| 2-CHLOROPHENOL | | | | | | | | | | | | |
| 1,3-DICHLOROBENZENE | | | | | | | | | | | | |
| 1,4-DICHLOROBENZENE | | | | | | | | | | | | |
| BENZYL ALCOHOL | | | | | | | | | | | | |
| 1,2-DICHLOROBENZENE | | | | | | | | | | | | |
| 2-METHYLPHENOL | | | | | | | | | | | | |
| BIS(2-CHLOROISOPROPYL)ETHER | | | | | | | | | | | | |
| 4-METHYLPHENOL | | | | | | | | | | | | |
| N-NITROSO-DI-N-PROPYLAMINE | | | | | | | | | | | | |
| HEXACHLOROETHANE | | | | | | | | | | | | |
| NITROBENZENE | | | | | | | | | | | | |
| ISOPHORONE | | | | | | | | | | | | |
| 2-NITROPHENOL | | | | | | | | | | | | |
| 2,4-DIMETHYLPHENOL | | | | | | | | | | | | |
| BENZOIC ACID | | | | | | | | | | | | |
| BIS(2-CHLOROETHOXY)METHANE | | | | | | | | | | | | |
| 2,4-DICHLOROPHENOL | | | | | | | | | | | | |
| 1,2,4-TRICHLOROBENZENE | | | | | | | | | | | | |
| NAPHTHALENE | | | | | | | | | | | | |
| 4-CHLOROANILINE | | | | | | | | | | | | |
| HEXACHLOROBUTADIENE | | | | | | | | | | | | |
| 4-CHLORO-3-METHYLPHENOL | | | | | | | | | | | | |
| 2-METHYLNAPHTHALENE | | | | | | | | | | | | |

AFFECTED SAMPLES:

| | |
|---|---|
| SBLK01, (MND 33-) | (MND 33-) |
| 0016-0001 | 0023-0001 |
| 0017-0001 | 0023-1001 |
| 0018-0001 | 0023-1001MS |
| 0019-0001 | 0023-1001 MSD |
| 0019-1001 | 0024-0001 |
| 0020-0001 | |
| 0021-0001 | |
| 0022-0001 + LISTED TO RIGHT | |

REVIEWER INITIALS: KMS

DATE: 12-16-91

* THESE FLAGS SHOULD BE APPLIED TO THE ANALYTES ON THE SAMPLE DATA SHEETS.

# CALIBRATION OUTLIERS
# SEMIVOLATILE TCL COMPOUNDS
# CLP SOW – 2/88

| INSTRUMENT # MS4 | INIT. CAL. | | | CONT. CAL. | | | CONT. CAL. | | | CONT. CAL. | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DATE/TIME: | 09-13-91 / 10:06 | | | 09-15-91 / 15:12 | | | | | | | | |
| | RF | %RSD | * | RF | %D | * | RF | %D | * | RF | %D | * |
| HEXACHLOROCYCLOPENTADIENE | | | | | | | | | | | | |
| 2,4,6-TRICHLOROPHENOL | | | | | | | | | | | | |
| 2,4,5-TRICHLOROPHENOL | | | | | | | | | | | | |
| 2-CHLORONAPHTHALENE | | | | | | | | | | | | |
| 2-NITROANILINE | | | | | | | | | | | | |
| DIMETHYL PHTHALATE | | | | | | | | | | | | |
| ACENAPHTHYLENE | | | | | | | | | | | | |
| 3-NITROANILINE | | | | | | | | | | | | |
| ACENAPHTHENE | | | | | | | | | | | | |
| 2,4-DINITROPHENOL | | | | | | | | | | | | |
| 4-NITROPHENOL | | | | | | | | | | | | |
| DIBENZOFURAN | | | | | | | | | | | | |
| 2,4-DINITROTOLUENE | | | | | | | | | | | | |
| 2,6-DINITROTOLUENE | | | | | | | | | | | | |
| DIETHYLPHTHALATE | | | | | | | | | | | | |
| 4-CHLOROPHENYL-PHENYLETHER | | | | | | | | | | | | |
| FLUORENE | | | | | | | | | | | | |
| 4-NITROANILINE | | | | | | | | | | | | |
| 4,6-DINITRO-2-METHYLPHENOL | | | | | | | | | | | | |
| N-NITROSODIPHENYLAMINE | | | | | | | | | | | | |
| 4-BROMOPHENYL-PHENYLETHER | | | | | | | | | | | | |
| HEXACHLOROBENZENE | | | | | | | | | | | | |
| PENTACHLOROPHENOL | | | | | | | | | | | | |
| PHENANTHRENE | | | | | | | | | | | | |
| ANTHRACENE | | | | | | | | | | | | |
| DI-N-BUTYLPHTHALATE | | | | | | | | | | | | |
| FLUORANTHENE | | | | | | | | | | | | |
| PRYENE | | | | | | | | | | | | |
| BUTYLBENZYLPHTHALATE | | | | | | | | | | | | |
| 3,3'-DICHLOROBENZIDINE | | | | | | | | | | | | |
| BENZO(A)ANTHRACENE | | | | | | | | | | | | |
| BIS(2-ETHYLHEXYL)PHTHALATE | | | | | | | | | | | | |
| CYRYSENE | | | | | | | | | | | | |
| DI-N-OCTYL PHTHALATE | | | | | | | | | | | | |
| BENZO(B)FLUORANTHENE | | | | | | | | | | | | |
| BENZO(K)FLUORANTHENE | | | | | | | | | | | | |
| BENZO(A)PYRENE | | | | | | | | | | | | |
| INDENO(1,2,3-CD)PYRENE | | | | | | | | | | | | |
| DIBENZ(A,H)ANTHRACENE | | | | | | | | | | | | |
| BENZO(G,H,I)PERYLENE | | | | | | | | | | | | |

# QUALIFIED DATA SUMMARY TABLE
# SEMIVOLATILE ORGANIC COMPOUNDS

PREPARED BY: H. Seeley

DATE: 3/3/02

LABORATORY BATCH #: REA 37051

LABORATORY NAME/LOCATION: IEAS-St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATE(s): 8/28,29/02

| ANALYTE | MOUND SAMPLE ID MN033-0016-0001 | MOUND SAMPLE ID MN033-0017-0001 | MOUND SAMPLE ID MN033-0018-0001 | MOUND SAMPLE ID MN033-0019-0001 |
|---|---|---|---|---|
| PHENOL | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| BIS(2-CHLOROETHYL)ETHER | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 2-CHLOROPHENOL | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 1,3-DICHLOROBENZENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 1,4-DICHLOROBENZENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| BENZYL ALCOHOL | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 1,2-DICHLOROBENZENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 2-METHYLPHENOL | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| BIS(2-CHLOROISOPROPYL)ETHER | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 4-METHYLPHENOL | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| N-NITROSO-DI-N-PROPYLAMINE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| HEXACHLOROETHANE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| NITROBENZENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| ISOPHORONE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 2-NITROPHENOL | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 2,4-DIMETHYLPHENOL | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| BENZOIC ACID | 2000 UJ | 2200 UJ | 2100 UJ | 1900 UJ |
| BIS(2-CHLOROETHOXY)METHANE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 2,4-DICHLOROPHENOL | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 1,2,4-TRICHLOROBENZENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| NAPHTHALENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 4-CHLOROANILINE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| HEXACHLOROBUTADIENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 4-CHLORO-3-METHYLPHENOL | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 2-METHYLNAPHTHALENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| HEXACHLOROCYCLOPENTADIENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 2,4,6-TRICHLOROPHENOL | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 2,4,5-TRICHLOROPHENOL | 2000 UJ | 2200 UJ | 2100 UJ | 1900 UJ |
| 2-CHLORONAPHTHALENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 2-NITROANILINE | 2000 UJ | 2200 UJ | 2100 UJ | 1900 UJ |

REVIEWER INITIALS:_____

DATE:_____

# QUALIFIED DATA SUMMARY TABLE
# SEMIVOLATILE ORGANIC COMPOUNDS

| ANALYTE | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID |
|---|---|---|---|---|
| | MW033-0016-0001 | MW033-0017-0001 | MW033-0018-0001 | MW033-0019-0001 |
| DIMETHYL PHTHALATE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| ACENAPHTHYLENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 3-NITROANILINE | 2000 UJ | 2200 UJ | 2100 UJ | 1900 UJ |
| ACENAPHTHENE | 420 UJ | 47 J | 420 UJ | 400 UJ |
| 2,4-DINITROPHENOL | 2000 UJ | 2200 UJ | 2100 UJ | 1900 UJ |
| 4-NITROPHENOL | 2000 UJ | 2200 UJ | 2100 UJ | 1900 UJ |
| DIBENZOFURAN | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 2,4-DINITROTOLUENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 2,6-DINITROTOLUENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| DIETHYLPHTHALATE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 4-CHLOROPHENYL-PHENYLETHER | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| FLUORENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 4-NITROANILINE | 2000 UJ | 2200 UJ | 2100 UJ | 1900 UJ |
| 4,6-DINITRO-2-METHYLPHENOL | 2000 UJ | 2200 UJ | 2100 UJ | 1900 UJ |
| N-NITROSODIPHENYLAMINE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| 4-BROMOPHENYL-PHENYLETHER | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| HEXACHLOROBENZENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| PENTACHLOROPHENOL | 2000 UJ | 2200 UJ | 2100 UJ | 1900 UJ |
| PHENANTHRENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| ANTHRACENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| DI-N-BUTYLPHTHALATE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| FLUORANTHENE | 420 UJ | 160 J | 420 UJ | 400 UJ |
| PRYENE | 420 UJ | 86 J | 420 UJ | 400 UJ |
| BUTYLBENZYLPHTHALATE | 420 UJ | 48 J | 420 UJ | 400 UJ |
| 3,3'-DICHLOROBENZIDINE | 840 UJ | 900 UJ | 850 UJ | 800 UJ |
| BENZO(A)ANTHRACENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| BIS(2-ETHYLHEXYL)PHTHALATE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| CYRYSENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| DI-N-OCTYL PHTHALATE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| BENZO(B)FLUORANTHENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| BENZO(K)FLUORANTHENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| BENZO(A)PYRENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| INDENO(1,2,3-CD)PYRENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| DIBENZ(A,H)ANTHRACENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |
| BENZO(G,H,I)PERYLENE | 420 UJ | 450 UJ | 420 UJ | 400 UJ |

REVIEWER INITIALS:_____

DATE:_____

# QUALIFIED DATA SUMMARY TABLE
# SEMIVOLATILE ORGANIC COMPOUNDS

PREPARED BY: H. Seeley

DATE: 3/3/92

LABORATORY BATCH #: REA 37051

LABORATORY NAME/LOCATION: ITAS-St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATE(s): 8/25-29/91

| ANALYTE | MOUND SAMPLE ID | | MOUND SAMPLE ID | | MOUND SAMPLE ID | | MOUND SAMPLE ID | |
|---|---|---|---|---|---|---|---|---|
| | MN033-0019-1001 | | MN033-0020-0001 | | MN033-0021-0001 | | MN033-0022-0001 | |
| PHENOL | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| BIS(2-CHLOROETHYL)ETHER | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 2-CHLOROPHENOL | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 1,3-DICHLOROBENZENE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 1,4-DICHLOROBENZENE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| BENZYL ALCOHOL | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 1,2-DICHLOROBENZENE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 2-METHYLPHENOL | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| BIS(2-CHLOROISOPROPYL)ETHER | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 4-METHYLPHENOL | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| N-NITROSO-DI-N-PROPYLAMINE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| HEXACHLOROETHANE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| NITROBENZENE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| ISOPHORONE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 2-NITROPHENOL | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 2,4-DIMETHYLPHENOL | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| BENZOIC ACID | 2500 | UJ | 2000 | UJ | 1800 | UJ | 1800 | UJ |
| BIS(2-CHLOROETHOXY)METHANE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 2,4-DICHLOROPHENOL | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 1,2,4-TRICHLOROBENZENE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| NAPHTHALENE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 4-CHLOROANILINE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| HEXACHLOROBUTADIENE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 4-CHLORO-3-METHYLPHENOL | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 2-METHYLNAPHTHALENE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| HEXACHLOROCYCLOPENTADIENE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 2,4,6-TRICHLOROPHENOL | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 2,4,5-TRICHLOROPHENOL | 2000 | UJ | 2000 | UJ | 1800 | UJ | 1800 | UJ |
| 2-CHLORONAPHTHALENE | 420 | UJ | 400 | UJ | 360 | UJ | 380 | UJ |
| 2-NITROANILINE | 2000 | UJ | 2000 | UJ | 1800 | UJ | 1800 | UJ |

REVIEWER INITIALS:_____

DATE:_____

# QUALIFIED DATA SUMMARY TABLE
# SEMIVOLATILE ORGANIC COMPOUNDS

| ANALYTE | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID |
|---|---|---|---|---|
| | MW033-0019-1001 | MW033-0020-0001 | MW033-0021-0001 | MW033-0022-0001 |
| DIMETHYL PHTHALATE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| ACENAPHTHYLENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| 3-NITROANILINE | 2000 UJ | 2000 UJ | 1800 UJ | 1800 UJ |
| ACENAPHTHENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| 2,4-DINITROPHENOL | 2000 UJ | 2000 UJ | 1800 UJ | 1800 UJ |
| 4-NITROPHENOL | 2000 UJ | 2000 UJ | 1800 UJ | 1800 UJ |
| DIBENZOFURAN | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| 2,4-DINITROTOLUENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| 2,6-DINITROTOLUENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| DIETHYLPHTHALATE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| 4-CHLOROPHENYL-PHENYLETHER | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| FLUORENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| 4-NITROANILINE | 2000 UJ | 2000 UJ | 1800 UJ | 1800 UJ |
| 4,6-DINITRO-2-METHYLPHENOL | 2000 UJ | 2000 UJ | 1800 UJ | 1800 UJ |
| N-NITROSODIPHENYLAMINE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| 4-BROMOPHENYL-PHENYLETHER | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| HEXACHLOROBENZENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| PENTACHLOROPHENOL | 2000 UJ | 2000 UJ | 1800 UJ | 1800 UJ |
| PHENANTHRENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| ANTHRACENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| DI-N-BUTYLPHTHALATE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| FLUORANTHENE | 69 J | 400 UJ | 360 UJ | 380 UJ |
| PRYENE | 44 J | 400 UJ | 360 UJ | 380 UJ |
| BUTYLBENZYLPHTHALATE | 420 UJ | 400 UJ | 53 J | 380 UJ |
| 3,3'-DICHLOROBENZIDINE | 840 UJ | 810 UJ | 720 UJ | 750 UJ |
| BENZO(A)ANTHRACENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| BIS(2-ETHYLHEXYL)PHTHALATE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| CYRYSENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| DI-N-OCTYL PHTHALATE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| BENZO(B)FLUORANTHENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| BENZO(K)FLUORANTHENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| BENZO(A)PYRENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| INDENO(1,2,3-CD)PYRENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| DIBENZ(A,H)ANTHRACENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |
| BENZO(G,H,I)PERYLENE | 420 UJ | 400 UJ | 360 UJ | 380 UJ |

REVIEWER INITIALS:_____

DATE:_____

# QUALIFIED DATA SUMMARY TABLE
# SEMIVOLATILE ORGANIC COMPOUNDS

PREPARED BY: H. Seeley

DATE: 3/3/92

LABORATORY BATCH #: RCA 37051

LABORATORY NAME/LOCATION: ITAS-St Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATE(s): 8/23, 29, 92

| ANALYTE | MOUND SAMPLE ID | | MOUND SAMPLE ID | | MOUND SAMPLE ID | | MOUND SAMPLE ID |
|---|---|---|---|---|---|---|---|
| | MW033-0023-0001 | | MW033-0023-1001 | | MW033-0024-0001 | | |
| PHENOL | 380 | UJ | 380 | UJ | 360 | UJ | |
| BIS(2-CHLOROETHYL)ETHER | 380 | UJ | 380 | UJ | 360 | UJ | |
| 2-CHLOROPHENOL | 380 | UJ | 380 | UJ | 360 | UJ | |
| 1,3-DICHLOROBENZENE | 380 | UJ | 380 | UJ | 360 | UJ | |
| 1,4-DICHLOROBENZENE | 380 | UJ | 380 | UJ | 360 | UJ | |
| BENZYL ALCOHOL | 380 | UJ | 380 | UJ | 360 | UJ | |
| 1,2-DICHLOROBENZENE | 380 | UJ | 380 | UJ | 360 | UJ | |
| 2-METHYLPHENOL | 380 | UJ | 380 | UJ | 360 | UJ | |
| BIS(2-CHLOROISOPROPYL)ETHER | 380 | UJ | 380 | UJ | 360 | UJ | |
| 4-METHYLPHENOL | 380 | UJ | 380 | UJ | 360 | UJ | |
| N-NITROSO-DI-N-PROPYLAMINE | 380 | UJ | 380 | UJ | 360 | UJ | |
| HEXACHLOROETHANE | 380 | UJ | 380 | UJ | 360 | UJ | |
| NITROBENZENE | 380 | UJ | 380 | UJ | 360 | UJ | |
| ISOPHORONE | 380 | UJ | 380 | UJ | 360 | UJ | |
| 2-NITROPHENOL | 380 | UJ | 380 | UJ | 360 | UJ | |
| 2,4-DIMETHYLPHENOL | 380 | UJ | 380 | UJ | 360 | UJ | |
| BENZOIC ACID | 1900 | UJ | 1800 | UJ | 1800 | UJ | |
| BIS(2-CHLOROETHOXY)METHANE | 380 | UJ | 380 | UJ | 360 | UJ | |
| 2,4-DICHLOROPHENOL | 380 | UJ | 380 | UJ | 360 | UJ | |
| 1,2,4-TRICHLOROBENZENE | 380 | UJ | 380 | UJ | 360 | UJ | |
| NAPHTHALENE | 380 | UJ | 380 | UJ | 360 | UJ | |
| 4-CHLOROANILINE | 380 | UJ | 380 | UJ | 360 | UJ | |
| HEXACHLOROBUTADIENE | 380 | UJ | 380 | UJ | 360 | UJ | |
| 4-CHLORO-3-METHYLPHENOL | 380 | UJ | 380 | UJ | 360 | UJ | |
| 2-METHYLNAPHTHALENE | 380 | UJ | 380 | UJ | 360 | UJ | |
| HEXACHLOROCYCLOPENTADIENE | 380 | UJ | 380 | UJ | 360 | UJ | |
| 2,4,6-TRICHLOROPHENOL | 380 | UJ | 380 | UJ | 360 | UJ | |
| 2,4,5-TRICHLOROPHENOL | 1900 | UJ | 1800 | UJ | 1800 | UJ | |
| 2-CHLORONAPHTHALENE | 380 | UJ | 380 | UJ | 360 | UJ | |
| 2-NITROANILINE | 1900 | UJ | 1800 | UJ | 1800 | UJ | |

REVIEWER INITIALS:_____

DATE:_____

# QUALIFIED DATA SUMMARY TABLE
# SEMIVOLATILE ORGANIC COMPOUNDS

| ANALYTE | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID |
|---|---|---|---|---|
| | MW033-0023-0001 | MW033-0023-1001 | MW035-0024-0001 | |
| DIMETHYL PHTHALATE | 380 UJ | 380 UJ | 360 UJ | |
| ACENAPHTHYLENE | 380 UJ | 380 UJ | 360 UJ | |
| 3-NITROANILINE | 1900 UJ | 1800 UJ | 1800 UJ | |
| ACENAPHTHENE | 380 UJ | 380 UJ | 360 UJ | |
| 2,4-DINITROPHENOL | 1900 UJ | 1800 UJ | 1800 UJ | |
| 4-NITROPHENOL | 380 UJ | 380 UJ | 360 UJ | |
| DIBENZOFURAN | 380 UJ | 380 UJ | 360 UJ | |
| 2,4-DINITROTOLUENE | 380 UJ | 380 UJ | 360 UJ | |
| 2,6-DINITROTOLUENE | 380 UJ | 380 UJ | 360 UJ | |
| DIETHYLPHTHALATE | 380 UJ | 380 UJ | 360 UJ | |
| 4-CHLOROPHENYL-PHENYLETHER | 380 UJ | 380 UJ | 360 UJ | |
| FLUORENE | 380 UJ | 380 UJ | 360 UJ | |
| 4-NITROANILINE | 1900 UJ | 1800 UJ | 1800 UJ | |
| 4,6-DINITRO-2-METHYLPHENOL | 1900 UJ | 1800 UJ | 1800 UJ | |
| N-NITROSODIPHENYLAMINE | 380 UJ | 380 UJ | 360 UJ | |
| 4-BROMOPHENYL-PHENYLETHER | 380 UJ | 380 UJ | 360 UJ | |
| HEXACHLOROBENZENE | 380 UJ | 380 UJ | 360 UJ | |
| PENTACHLOROPHENOL | 1900 UJ | 1800 UJ | 1800 UJ | |
| PHENANTHRENE | 380 UJ | 380 UJ | 360 UJ | |
| ANTHRACENE | 380 UJ | 380 UJ | 360 UJ | |
| DI-N-BUTYLPHTHALATE | 380 UJ | 380 UJ | 360 UJ | |
| FLUORANTHENE | 380 UJ | 380 UJ | 360 UJ | |
| PRYENE | 380 UJ | 380 UJ | 360 UJ | |
| BUTYLBENZYLPHTHALATE | 380 UJ | 380 UJ | 360 UJ | |
| 3,3'-DICHLOROBENZIDINE | 760 UJ | 760 UJ | 730 UJ | |
| BENZO(A)ANTHRACENE | 380 UJ | 380 UJ | 360 UJ | |
| BIS(2-ETHYLHEXYL)PHTHALATE | 380 UJ | 380 UJ | 360 UJ | |
| CYRYSENE | 380 UJ | 380 UJ | 360 UJ | |
| DI-N-OCTYL PHTHALATE | 380 UJ | 380 UJ | 360 UJ | |
| BENZO(B)FLUORANTHENE | 380 UJ | 380 UJ | 360 UJ | |
| BENZO(K)FLUORANTHENE | 380 UJ | 380 UJ | 360 UJ | |
| BENZO(A)PYRENE | 380 UJ | 380 UJ | 360 UJ | |
| INDENO(1,2,3-CD)PYRENE | 380 UJ | 380 UJ | 360 UJ | |
| DIBENZ(A,H)ANTHRACENE | 380 UJ | 380 UJ | 360 UJ | |
| BENZO(G,H,I)PERYLENE | 380 UJ | 380 UJ | 360 UJ | |

REVIEWER INITIALS:_____

DATE:_____

1 WESTON WAY
WEST CHESTER, PA 19380-1449
PHONE: 215-692-3030
FAX: 215-430-3124

# REPORT OF DATA VALIDATION RESULTS

PROJECT: LANL Mound PROJECT NUMBER: 27444001

TACK: Operable Unit 3 DATE: February 21, 1992

LABORATORY: IT Analytical Services
LAB BATCH: REA37051
ANALYSIS: Pesticide/PCB Organic Compounds

## 1. CASE SUMMARY

Eleven soil samples were collected on August 28,29-91 for pesticide/PCB organic compounds and were assigned IT Laboratory batch number REA37051. Samples were apparently received by the laboratory in good condition.

Sample analysis was performed according to the Method 8080, SW846 by IT laboratories in Earth City, Missouri. The following samples apply to this data validation report:

Batch REA37051

MND33-0016-0001
MND33-0017-0001
MND33-0018-0001
MND33-0019-0001
MND33-0019-1001
MND33-0020-0001
MND33-0021-0001
MND33-0022-0001
MND33-0023-0001
MND33-0023-1001
MND33-0023-1001MS
MND33-0023-1001MSD
MND33-0024-0001

## 2. SAMPLE HOLDING TIMES

All sample analyses exceeded the 7-day EPA extraction holding time requirement from 4 to 5 days; therefore, all sample data is considered as estimated.

Reviewer: Kelly Muirhead

## 3. RESULTS OF LABORATORY QUALITY CONTROL CHECKS

### a. Calibration

Several %RSD results exceeded the QC limit in the initial 5-point calibration. These compounds were not detected in the samples. All data have been qualified in reference to the exceeded holding time; therefore, no additional qualifier codes have been applied.

### b. Method Blanks

The method blanks were free of target compound contamination.

### c. Surrogate Spikes

All surrogate recoveries were within the CLP-SOW QC limits. However, the surrogate recoveries for QC samples MND33-0023-1001 MS/MSD 1 DL were not listed on the Form II. Since these dilution analyses were only for two of the compounds, addition of this information on the Form II is not required.

### d. Matrix spike and Matrix Spike Duplicates

All spike recoveries were within the QC criteria established in the CLP-SOW.

### e. Compound Identification

All positive sample results fell within the required retention time windows. Chromatographic quality and peak separation were satisfactory.

### f. System Performance

The instrument performance was stable throughout these analyses.

Reviewer: Kelly Minfatte

g. Compound Quantitation and Reported Detection Limits

All calculations of the detected compounds were confirmed. The CRQLs were adjusted accordingly.

## 4. RESULTS OF ASSOCIATED QUALITY CONTROL CHECKS

a. Field Duplicates

No field duplicate was reported with this data set.

b. Field Blanks

No field blanks were reported with this data set.

## 5. OVERALL ASSESSMENT OF THE DATA

Table 6 presents a summary of the sample results, and any qualification that has been described in this report.

Batch REA37051

All data has been accepted within the applied qualifier codes. Positive results have been qualified due to exceeded holding time in the pesticide/PCB fraction.

## 6. REFERENCES

EPA, November 1986. Test Methods for Evaluating Solid Waste, SW846.

EPA, 1988. "Laboratory Data Validation - Functional Guidelines for Evaluation of Organic Analyses," U.S. Environmental Protection Agency, Hazardous Site Evaluation Division. February 1988.

Reviewer: Kelly Mein Foutte

REPORT OF DATA VALIDATION RESULTS LAB BATCH: REA37051

ATTACHMENTS

TABLE 1 - EXCEEDED HOLDING TIME
TABLE 2 - SURROGATE RECOVERY OUTLIERS
TABLE 3 - MATRIX SPIKE RECOVERY OUTLIERS
TABLE 4 - METHOD BLANK OUTLIERS
TABLE 5 - CALIBRATION OUTLIERS
TABLE 6 - QUALIFIED DATA SUMMARY TABLE

# EXCEEDED HOLDING TIMES
# PESTICIDE/PCB'S COMPOUNDS
# SW846 – METHOD 8080

PREPARED BY: Kelly Spittler

DATE: 12-16-91

LANL MOUND PROJECT

LABORATORY BATCH # REA 37051

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: IT AS - St. Louis

COLLECTION DATE(s): [illegible]

| LABORATORY SAMPLE ID | MOUND SAMPLE ID | DATE COLLECTED | DATE EXTRACTED | DATE ANALYZED | NUMBER OF DAYS PAST HOLDING TIME |
|---|---|---|---|---|---|
| 1530-006 | (MND33-) 0020-0001 | 08-29-91 | 09-09-91 | 09-18-91 | 4 |
| 1530-007 | 0021-0001 | ↓ | ↓ | ↓ | 4 |
| 1530-008 | 0022-0001 | ↓ | ↓ | ↓ | 4 |
| 1530-009 | 0023-0001 | ↓ | ↓ | ↓ | 4 |
| 1530-010 | 0023-1001 | ↓ | ↓ | ↓ | 4 |
| 1530-010 MS1 | 0023-1001 MS1 | ↓ | ↓ | ↓ | 4 |
| 1530-010 MSD1 | 0023-1001 MSD1 | ↓ | ↓ | 09-19-91 | 4 |
| 1530-010 MS2 | 0023-1001 MS2 | ↓ | ↓ | ↓ | 4 |
| 1530-010 MSD2 | 0023-1001 MSD2 | ↓ | ↓ | ↓ | 4 |
| 1530-011 | 0024-0001 | ↓ | ↓ | ↓ | 4 |
| 1530-010 MS1 DL | 0023-1001 MS1 DL | ↓ | ↓ | ↓ | 4 |
| 1530-010 MSD DL | 0023-1001 MSD DL | ↓ | ↓ | ↓ | 4 |

# EXCEEDED HOLDING TIMES
# PESTICIDE/PCB'S COMPOUNDS
# SW846 – METHOD 8080

PREPARED BY: [illegible]

DATE: 12-16-91

LANL MOUND PROJECT

LABORATORY BATCH # KA 57051

OPERABLE UNIT NO.:

LABORATORY NAME/LOCATION: [illegible]

COLLECTION DATE(s): [illegible]

| LABORATORY SAMPLE ID | MOUND SAMPLE ID (MND 33-) | DATE COLLECTED | DATE EXTRACTED | DATE ANALYZED | NUMBER OF DAYS PAST HOLDING TIME |
|---|---|---|---|---|---|
| 1530-001 | 0016-0001 | 08-28-91 | 09-09-91 | 09-18-91 | 5 |
| 1530-002 | 0017-0001 | ↓ | ↓ | ↓ | 5 |
| 1530-003 | 0018-0001 | ↓ | ↓ | ↓ | 5 |
| 1530-004 | 0019-0001 | ↓ | ↓ | ↓ | 5 |
| 1530-005 | 0019-1001 | ↓ | ↓ | ↓ | 5 |
| | | | | | |
| | | | | | |
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# SURROGATE RECOVERY OUTLIERS
# PESTICIDES/PCB's COMPOUNDS
# SW846 – METHOD 8080

PREPARED BY: Kelly Spitler

DATE: 12 16-91

LABORATORY BATCH #: RKA 37051

LABORATORY NAME/LOCATION: [illegible]

LANL MOUND PROJECT

OPERABLE UNIT NO.: _____

COLLECTION DATE(s): [illegible]

**SOIL QC LIMITS**
DIBUTYLCHORENDATE (24–150%)

**WATER QC LIMITS**
DIBUTYLCHORENDATE (24–154%)

| LABORATORY SAMPLE ID | MOUND SAMPLE ID | SAMPLE MATRIX | DIBUTYLCHORENDATE |
|---|---|---|---|
| All surrogates within | | | |
| criteria | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# MATRIX SPIKE RECOVERY OUTLIERS
# PESTICIDE/PCB's COMPOUNDS
# SW846 – METHOD 8080

PREPARED BY: Kelly Spittler

DATE: 12-16-91

LABORATORY BATCH #: KBA 37051

LABORATORY NAME/LOCATION: ITAS - St Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: _____

COLLECTION DATE(s): 25 10 - 25 - 91

**SOIL QC LIMITS**
LINDANE (32–127%)
HEPTACHLOR (34–111%)
ALDRIN (42–122%)
DIELDRIN (36–146%)
ENDRIN (30–147%)
4,4'–DDT (25–160%)

**WATER QC LIMITS**
LINDANE (56–123%)
HEPTACHLOR (40–131%)
ALDRIN (40–120%)
DIELDRIN (52–126%)
ENDRIN (56–121%)
4,4'–DDT (38–127%)

| LABORATORY SAMPLE ID | MOUND SAMPLE ID | SAMPLE MATRIX | LINDANE | HEPTACHLOR | ALDRIN | DIELDRIN | ENDRIN | 4,4'–DDT |
|---|---|---|---|---|---|---|---|---|
| All spikes are | | | | | | | | |
| within QC limits | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
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# METHOD BLANK OUTLIERS
# PESTICIDE/PCB'S ORGANIC COMPOUNDS
# SW846 – METHOD 8080

PREPARED BY: Kelly Spittler

DATE: 12-16-91

LABORATORY BATCH #: REA 37051

LABORATORY NAME/LOCATION: IPAS St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.:

COLLECTION DATE(s): [illegible]

APPLIES TO SAMPLES:

(max. 15)

| | | |
|---|---|---|
| 0020 0001 | 0023-1001 MSD1 | |
| 0021-0001 | 0023-1001 MS2 | |
| 0022-0001 | 0023-1001 MSD2 | |
| 0023-0001 | 0024-0001 | |
| 0023-1001 | 0023-1001 MS1 DL | |
| 0023 1001 MS1 | 0023-1001 MS1 DL | |

| LABORATORY SAMPLE ID | Time | | | |
|---|---|---|---|---|
| PBlk 01 | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

# METHOD BLANK OUTLIERS
# PESTICIDE/PCB'S ORGANIC COMPOUNDS
# SW846 – METHOD 8080

PREPARED BY: Kelly Spitler

DATE: 12-16-91

LABORATORY BATCH #: RBA 57051

LABORATORY NAME/LOCATION: [illegible] St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: _____

COLLECTION DATE(s): [illegible]

APPLIES TO SAMPLES:
(MW 53-)

0016-0001

0017-0001

0018-0001

0019-0001

0020-0001

| LABORATORY SAMPLE ID | None | | | |
|---|---|---|---|---|
| PBLK01RE | | | | |

# CALIBRATION OUTLERS
# PESTICIDE/PCB COMPOUNDS
# SW846 – METHOD 8080

PREPARED BY: [illegible]

DATE: 12-10-[illegible]

LANL MOUND PROJECT

LABORATORY BATCH/CASE #: KCA 37051

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: [illegible]

COLLECTION DATE(s): [illegible]

PREPARATION BLANK MATRIX (SOIL/WATER): Soil

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): ug/kg

INSTRUMENT #: GCE-1701
COLUMN TYPE: PACK
DATE/TIME

| | INIT. CAL. | | | CONT. CAL. | | | CONT. CAL. | | |
|---|---|---|---|---|---|---|---|---|---|
| | CF | %RSD | * | CF | %D | * | CF | %D | * |
| ALPHA-BHC | | | | | | | | | |
| BETA-BHC | | 30 | | | | | | | |
| DELTA-BHC | | | | | | | | | |
| GAMMA-BHC (LINDANE) | | | | | | | | | |
| HEPTACLOR | | 21 | | | | | | | |
| ALDRIN | | | | | | | | | |
| HEPTACLOR EPOXIDE | | 20 | | | | | | | |
| ENDOSULFAN I | | | | | | | | | |
| DIELDRIN | | | | | | | | | |
| 4,4'-DDE | | | | | | | | | |
| ENDRIN | | | | | | | | | |
| ENDOSULFAN II | | | | | | | | | |
| 4,4'-DDD | | | | | | | | | |
| ENDOSULFAN SULFATE | | | | | | | | | |
| 4,4'-DDT | | | | | | | | | |
| METHOXYCLOR | | 20 | | | | | | | |
| ENDRIN KETONE | | | | | | | | | |
| ENDRIN ALDEHYDE | | | | | | | | | |
| ALPHA-CHLORDANE | | | | | | | | | |
| GAMMA-CHLORDANE | | | | | | | | | |
| TOXAPHENE | | | | | | | | | |
| AROCLOR 1016 | | | | | | | | | |
| AROCLOR 1221 | | | | | | | | | |
| AROCLOR 1232 | | 21 | | | | | | | |
| AROCLOR 1242 | | 23 | | | | | | | |
| AROCLOR 1248 | | | | | | | | | |
| AROCLOR 1254 | | 24 | | | | | | | |
| AROCLOR 1260 | | | | | | | | | |
| DIBUTYLCHLORENDATE | | 20 | | | | | | | |
| TETRACHLORO-M-XYLENE | | [illegible] | | | | | | | |

AFFECTED SAMPLES

REVIEWER INITIALS: [illegible]

DATE: [illegible]

* THESE FLAGS SHOULD BE APPLIED TO THE ANALYTES ON THE SAMPLE DATA SHEETS.

# CALIBRATION OUTLERS
# PESTICIDE/PCB COMPOUNDS
# SW846 – METHOD 8080

PREPARED BY: [illegible]

DATE: [illegible]-91

LANL MOUND PROJECT

LABORATORY BATCH/CASE #: 1242 3705 1

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITAS – St. Louis

COLLECTION DATE(s): [illegible]-91

PREPARATION BLANK MATRIX (SOIL/WATER): Soil

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): ug/kg

INSTRUMENT #: 604-DB-5
COLUMN TYPE: PACK
DATE/TIME

| | INIT. CAL | | | CONT. CAL | | | CONT. CAL | | |
|---|---|---|---|---|---|---|---|---|---|
| | CF | %RSD | * | CF | %D | * | CF | %D | * |
| ALPHA-BHC | | | | | | | | | |
| BETA-BHC | | | | | | | | | |
| DELTA-BHC | | | | | | | | | |
| GAMMA-BHC (LINDANE) | | | | | | | | | |
| HEPTACLOR | | | | | | | | | |
| ALDRIN | | | | | | | | | |
| HEPTACLOR EPOXIDE | | | | | | | | | |
| ENDOSULFAN I | | | | | | | | | |
| DIELDRIN | | | | | | | | | |
| 4,4'-DDE | | | | | | | | | |
| ENDRIN | | | | | | | | | |
| ENDOSULFAN II | | | | | | | | | |
| 4,4'-DDD | | | | | | | | | |
| ENDOSULFAN SULFATE | | | | | | | | | |
| 4,4'-DDT | | | | | | | | | |
| METHOXYCLOR | | | | | | | | | |
| ENDRIN KETONE | | | | | | | | | |
| ENDRIN ALDEHYDE | | | | | | | | | |
| ALPHA-CHLORDANE | | | | | | | | | |
| GAMMA-CHLORDANE | | | | | | | | | |
| TOXAPHENE | | | | | | | | | |
| AROCLOR 1016 | | | | | | | | | |
| AROCLOR 1221 | | | | | | | | | |
| AROCLOR 1232 | | | | | | | | | |
| AROCLOR 1242 | | | | | | | | | |
| AROCLOR 1248 | | | | | | | | | |
| AROCLOR 1254 | | | | | | | | | |
| AROCLOR 1260 | | | | | | | | | |
| DIBUTYLCHLORENDATE | | | | | | | | | |
| TETRACHLORO-M-XYLENE | | | | | | | | | |

AFFECTED SAMPLES

| | | |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

REVIEWER INITIALS: [illegible]

DATE: [illegible]-91

* THESE FLAGS SHOULD BE APPLIED TO THE ANALYTES ON THE SAMPLE DATA SHEETS.

# QUALIFIED DATA SUMMARY TABLE
# PESTICIDE/PCB COMPOUNDS

PREPARED BY: H. Seeley

DATE: 3/3/92

LABORATORY BATCH/CASE #: RQA 37051

LABORATORY NAME/LOCATION: IT-St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATE(s): 8/28, 29/92

| ANALYTE | MOUND SAMPLE ID MJW033-0016-0001 | MOUND SAMPLE ID MJW033-0017-0001 | MOUND SAMPLE ID MJW037-0018-0001 | MOUND SAMPLE ID MJW033-0019-0001 |
|---|---|---|---|---|
| ALPHA-BHC | 2.5 UJ | 2.7 UJ | 2.6 UJ | 2.4 UJ |
| BETA-BHC | 5.1 UJ | 5.5 UJ | 5.1 UJ | 4.9 UJ |
| DELTA-BHC | 14 J | 8.2 UJ | 7.7 UJ | 7.3 UJ |
| GAMMA-BHC (LINDANE) | 3.4 UJ | 3.7 UJ | 3.5 UJ | 3.3 UJ |
| HEPTACLOR | 2.5 UJ | 2.7 UJ | 2.6 UJ | 2.4 UJ |
| ALDRIN | 3.4 UJ | 3.7 UJ | 3.5 UJ | 3.3 UJ |
| HEPTACLOR EPOXIDE | 70 UJ | 76 UJ | 71 UJ | 68 UJ |
| ENDOSULFAN I | 12 UJ | 13 UJ | 12 UJ | 11 UJ |
| DIELDRIN | 1.6 UJ | 1.8 UJ | 1.7 UJ | 1.6 UJ |
| 4,4'-DDE | 3.4 UJ | 3.7 UJ | 3.5 UJ | 3.3 UJ |
| ENDRIN | 5.1 UJ | 5.5 UJ | 5.1 UJ | 4.9 UJ |
| ENDOSULFAN II | 3.4 UJ | 3.7 UJ | 3.5 UJ | 3.3 UJ |
| 4,4'-DDD | 9.4 UJ | 10 UJ | 9.5 UJ | 9.0 UJ |
| ENDOSULFAN SULFATE | 56 UJ | 60 UJ | 57 UJ | 54 UJ |
| 4,4'-DDT | 10 UJ | 11 UJ | 10 UJ | 9.7 UJ |
| METHOXYCLOR | 150 UJ | 160 UJ | 150 UJ | 140 UJ |
| ENDRIN KETONE | 20 UJ | 22 UJ | 21 UJ | 20 UJ |
| ENDRIN ALDEHYDE | 20 UJ | 21 UJ | 20 UJ | 19 UJ |
| ALPHA-CHLORDANE | 12 UJ | 13 UJ | 12 UJ | 11 UJ |
| GAMMA-CHLORDANE | 12 UJ | 13 UJ | 12 UJ | 11 UJ |
| TOXAPHENE | 200 UJ | 220 UJ | 210 UJ | 200 UJ |
| AROCLOR 1016 | 100 UJ | 110 UJ | 100 UJ | 97 UJ |
| AROCLOR 1221 | 100 UJ | 110 UJ | 100 UJ | 97 UJ |
| AROCLOR 1232 | 100 UJ | 110 UJ | 100 UJ | 97 UJ |
| AROCLOR 1242 | 100 UJ | 110 UJ | 100 UJ | 97 UJ |
| AROCLOR 1248 | 100 UJ | 110 UJ | 100 UJ | 97 UJ |
| AROCLOR 1254 | 200 UJ | 220 UJ | 200 UJ | 190 UJ |
| AROCLOR 1260 | 200 UJ | 220 UJ | 200 UJ | 190 UJ |
| DIBUTYLCHLORENDATE | | | | |
| TETRACHLORO-M-XYLENE | | | | |

REVIEWER INITIALS: _____

DATE: _____

# QUALIFIED DATA SUMMARY TABLE
# PESTICIDE/PCB COMPOUNDS

PREPARED BY: H. Serley

DATE: 3/3/92

LABORATORY BATCH/CASE #: KEA37051

LABORATORY NAME/LOCATION: ITAS-St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATE(s): 8/28,29/92

| ANALYTE | MOUND SAMPLE ID | | MOUND SAMPLE ID | | MOUND SAMPLE ID | | MOUND SAMPLE ID | |
|---|---|---|---|---|---|---|---|---|
| | MW033-0019-0001 | | MW037-0020-0001 | | MW033-0021-0001 | | MW037-0022-0001 | |
| ALPHA-BHC | 2.6 | UJ | 2.4 | UJ | 2.2 | UJ | 2.3 | UJ |
| BETA-BHC | 5.1 | UJ | 4.9 | UJ | 4.4 | UJ | 4.6 | UJ |
| DELTA-BHC | 8.6 | UJ | 7.3 | UJ | 6.5 | UJ | 6.9 | UJ |
| GAMMA-BHC (LINDANE) | 3.4 | UJ | 3.3 | UJ | 2.9 | UJ | 3.1 | UJ |
| HEPTACLOR | 2.6 | UJ | 2.4 | UJ | 2.2 | UJ | 2.3 | UJ |
| ALDRIN | 3.4 | UJ | 3.3 | UJ | 2.9 | UJ | 3.1 | UJ |
| HEPTACLOR EPOXIDE | 71 | UJ | 68 | UJ | 61 | UJ | 64 | UJ |
| ENDOSULFAN I | 12 | UJ | 11 | UJ | 10 | UJ | 11 | UJ |
| DIELDRIN | 1.7 | UJ | 1.6 | UJ | 1.4 | UJ | 1.5 | UJ |
| 4,4'-DDE | 3.4 | UJ | 3.3 | UJ | 2.9 | UJ | 3.1 | UJ |
| ENDRIN | 5.1 | UJ | 4.9 | UJ | 4.4 | UJ | 4.6 | UJ |
| ENDOSULFAN II | 3.4 | UJ | 3.3 | UJ | 2.9 | UJ | 3.1 | UJ |
| 4,4'-DDD | 9.4 | UJ | 9.0 | UJ | 8.1 | UJ | 8.5 | UJ |
| ENDOSULFAN SULFATE | 56 | UJ | 54 | UJ | 48 | UJ | 50 | UJ |
| 4,4'-DDT | 10 | UJ | 9.7 | UJ | 8.7 | UJ | 9.1 | UJ |
| METHOXYCLOR | 156 | UJ | 140 | UJ | 130 | UJ | 130 | UJ |
| ENDRIN KETONE | 20 | UJ | 19 | UJ | 18 | UJ | 18 | UJ |
| ENDRIN ALDEHYDE | 20 | UJ | 19 | UJ | 17 | UJ | 18 | UJ |
| ALPHA-CHLORDANE | 12 | UJ | 11 | UJ | 10 | UJ | 11 | UJ |
| GAMMA-CHLORDANE | HS ~~[illegible]~~ 12 | UJ | 11 | UJ | 10 | UJ | 11 | UJ |
| TOXAPHENE | 200 | UJ | 200 | UJ | 180 | UJ | 180 | UJ |
| AROCLOR 1016 | 100 | UJ | 97 | UJ | 87 | UJ | 92 | UJ |
| AROCLOR 1221 | 100 | UJ | 97 | UJ | 87 | UJ | 92 | UJ |
| AROCLOR 1232 | 100 | UJ | 97 | UJ | 87 | UJ | 92 | UJ |
| AROCLOR 1242 | 100 | UJ | 97 | UJ | 87 | UJ | 92 | UJ |
| AROCLOR 1248 | 100 | UJ | 97 | UJ | 87 | UJ | 92 | UJ |
| AROCLOR 1254 | 200 | UJ | 190 | UJ | 170 | UJ | 180 | UJ |
| AROCLOR 1260 | 200 | UJ | 190 | UJ | 170 | UJ | 180 | UJ |
| DIBUTYLCHLORENDATE | | | | | | | | |
| TETRACHLORO-M-XYLENE | | | | | | | | |

REVIEWER INITIALS: _____

DATE: _____

# QUALIFIED DATA SUMMARY TABLE
# PESTICIDE/PCB COMPOUNDS

PREPARED BY: H. Seeley

DATE: 3/3/92

LABORATORY BATCH/CASE #: REA 37051

LABORATORY NAME/LOCATION: EAS-St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATE(s): 8/28,29,92

| ANALYTE | MOUND SAMPLE ID | | MOUND SAMPLE ID | | MOUND SAMPLE ID | | MOUND SAMPLE ID | |
|---|---|---|---|---|---|---|---|---|
| | MN033-0023-0001 | | MN033-0023-1001 | | MN023-0024-0001 | | | |
| ALPHA-BHC | 2.3 | UJ | 2.3 | UJ | 2.2 | UJ | | |
| BETA-BHC | 4.6 | UJ | 4.6 | UJ | 4.4 | UJ | | |
| DELTA-BHC | 7.0 | UJ | 7.0 | UJ | 6.6 | UJ | | |
| GAMMA-BHC (LINDANE) | 3.1 | UJ | 3.1 | UJ | 3.0 | UJ | | |
| HEPTACLOR | 2.3 | UJ | 2.3 | UJ | 2.2 | UJ | | |
| ALDRIN | 3.1 | UJ | 3.1 | UJ | 3.0 | UJ | | |
| HEPTACLOR EPOXIDE | 64 | UJ | 64 | UJ | 61 | UJ | | |
| ENDOSULFAN I | 11 | UJ | 11 | UJ | 10 | UJ | | |
| DIELDRIN | 1.5 | UJ | 1.5 | UJ | 1.4 | UJ | | |
| 4,4'-DDE | 3.1 | UJ | 3.1 | UJ | 3.0 | UJ | | |
| ENDRIN | 4.6 | UJ | 4.6 | UJ | 4.4 | UJ | | |
| ENDOSULFAN II | 3.1 | UJ | 3.1 | UJ | 3.0 | UJ | | |
| 4,4'-DDD | 8.6 | UJ | 8.6 | UJ | 8.1 | UJ | | |
| ENDOSULFAN SULFATE | 51 | UJ | 57 | UJ | 49 | UJ | | |
| 4,4'-DDT | 9.3 | UJ | 9.3 | UJ | 8.8 | UJ | | |
| METHOXYCLOR | 140 | UJ | 140 | UJ | 130 | UJ | | |
| ENDRIN KETONE | 19 | UJ | 18 | UJ | 18 | UJ | | |
| ENDRIN ALDEHYDE | 18 | UJ | 18 | UJ | 17 | UJ | | |
| ALPHA-CHLORDANE | 11 | UJ | 11 | UJ | 10 | UJ | | |
| GAMMA-CHLORDANE | 11 | UJ | 11 | UJ | 10 | UJ | | |
| TOXAPHENE | 190 | UJ | 190 | UJ | 180 | UJ | | |
| AROCLOR 1016 | 93 | UJ | 93 | UJ | 88 | UJ | | |
| AROCLOR 1221 | 93 | UJ | 93 | UJ | 88 | UJ | | |
| AROCLOR 1232 | 93 | UJ | 93 | UJ | 88 | UJ | | |
| AROCLOR 1242 | 93 | UJ | 93 | UJ | 88 | UJ | | |
| AROCLOR 1248 | 93 | UJ | 93 | UJ | 88 | UJ | | |
| AROCLOR 1254 | 180 | UJ | 180 | UJ | 180 | UJ | | |
| AROCLOR 1260 | 180 | UJ | 180 | UJ | 180 | UJ | | |
| DIBUTYLCHLORENDATE | | | | | | | | |
| TETRACHLORO-M-XYLENE | | | | | | | | |

REVIEWER INITIALS: _____

DATE: _____

REPORT OF DATA VALIDATION RESUITS

PROJECT: LANL Mound PROJECT NUMBER: 27444001

TASK: Operable Unit 3 DATE: February 21, 1992

LABORATORY: ITAS - ST. LOUIS
LAB BATCH: REA37051
ANALYSIS: Metals

## 1. CASE SUMMARY

Eleven soil samples collected on 8/28,29/91 were assigned IT Laboratory Batch number REA37051. The samples were apparently received by the laboratory in good condition.

Sample analysis was performed according to the USEPA Contract Laboratory Program (CLP method) 3/90 Inorganic Statement of Work (SOW) by IT Laboratories in St. Louis. The following samples apply to this validation report.

Batch REA37051

| | | | |
|---|---|---|---|
| MND3300160001 | MND3300190001 | MND3300210001 | MND3300231001 |
| MND3300170001 | MND3300191001 | MND3300220001 | MND3300240001 |
| MND3300180001 | MND3300200001 | MND3300230001 | |

## 2. DATA COMPLETENESS

The Chain of Custody (page 325) was not signed or dated. This does not severely impact the data validation.

## 3. SAMPLE HOLDING TIMES

All samples for metals analysis were analyzed within the 28 day holding time for mercury and 180 day holding time for the other analytes. All samples for CN analysis were analyzed within the 14 day holding time.

Reviewer:

## 4. RESULTS OF LABORATORY QUALITY CONTROL CHECKS

### a. Calibration

Initial and continuing calibration check standards (ICV's and CCV's) and the CRDL standards were evaluated against CLP Inorganic SOW 3/90 criteria and the Functional Guidelines for Evaluation Inorganics Analyses (7/88). All results were deemed to be acceptable.

The beginning CCV sample was not performed for As, Se, Tl, Cn, or Hg as required by SOW 3/90 (E-11). The data, however, is considered to be acceptable unqualified because the samples are bracketed by acceptable ICV and CCV samples.

## RESULTS OF LABORATORY QUALITY CONTROL CHECKS

### b. Blanks

1. Prep blanks

The preparation blank contained Sb (48.65 ug/L), Ba (1.01 ug/L), Ca (18.72 ug/L), Co (4.11 ug/L), Cu (3.0 ug/L), Fe(5.13 ug/L), Pb (1.43 ug/L), Mg (14.06 ug/L), Na (148.92 ug/L), and Zn (2.76) above the IDL. All associated sample results $\geq$ IDL but $\leq$ 5x the blank values are qualified "U" due to laboratory contamination. All results < IDL or >5x the blank value are accepted unqualified.

The preparation blank should have been reported as a soil (MG/KG).

2. Calibration blanks

The calibration blanks contained Ba (2.0 ug/L), Cd (4.5 ug/L), Ca (13.0 ug/L), Co (6.2 ug/L), Cu (6.0 ug/L), Fe (10.7 ug/L), Pb (1.4 ug/L),mg (3.3 ug/L), Ag (7.8 ug/L), Na (16.9 ug/L), Zn (3.8 ug/L). All associated sample results $\geq$ IDL but $\leq$ 5x the blank values are qualified "U" due to field contamination. All results < IDL or >5x the blank value are accepted unqualified.

Reviewer:

The calibration blanks contained Cr (-3.2 ug/L) and Ni (-17.4 ug/L) below the negative IDL. All associated sample results $\leq$ 5x the blank value are qualified as estimated and considered to be biased low.

c. **Interference check sample**

The interference check sample contained Ag, Ba, Cu, Na, Sb, and Zn above the IDL. All associated sample results with interfering element values >50% of the ICS values are qualified as estimated.

The interference check sample contained Cd, Co Mn, Ni, and V below the negative IDL. All associated sample results with interfering element values >50% of the ICS values are qualified as estimated, and considered to be biased low (or false negatives).

The ICSA (initial) sample result for Mg should be 519600, and the ICSAB (initial) sample result should be 517100.

d. **Laboratory Control Samples**

A water LCS was reported for soil samples. This is an acceptable practice when the laboratory is unable to obtain a soil LCS.

e. **Duplicate Sample Analysis**

1. Laboratory duplicates

The duplicate digestion sample for Pb was outside the CLP control limit (20% RSD) but within validation control limits (35% RSD) so no qualification was required.

b. Field duplicates

The field duplicate digestion sample (191001) was outside the validation control limits (35% RPD) for Ca, Mg, and Mn. All associated sample results are qualified as estimated due to the lack of sample homogeneity, or field contamination.

The field duplicate digestion sample (231001) was outside the validation control limits (35% RPD) for Ba. All associated sample results are qualified as estimated due to the lack of sample homogeneity, or field contamination.

Reviewer:

f. **Matrix Spike Sample Analysis**

The matrix spike sample percent recovery for Cd (65.1), and Se (70.3) were below the CLP control limits. All associated sample results are qualified as estimated and are considered to be biased low.

**RESULTS OF LABORATORY QUALITY CONTROL CHECKS**

g. **Furnace Atomic Absorption QC**

1. Post digestion spike percent recoveries:

The post digestion spike sample percent recoveries for Se were below the CLP validation control limits (<85%). All associated sample results are qualified as estimated and are considered to be biased low (20-0001, 21-0001, 22-0001, 23-0001, 23-1001, 24-001).

2. Method of Standard Addition:

The MSA correlation coefficient for As and Se was <0.995. All associated sample results are qualified as estimated (As=16-0001, Se=16-0001, 18-0001, 19,0001).

h. ICP Serial Dilution

The serial dilution sample percent difference for Cu, and Fe were above the CLP validation control limits (10%). All associated sample results are qualified as estimated.

i. **Sample Result Verification**

The Linear Range (page 70) is reported in PPM not PPB. This does not severely impact the data validation.

Form XIII did not list duplicate and spike digestions. This does not severely impact the data validation.

The "M" flag for GFAA, Hg and CN analyses was not required.

Reviewer: _____

## 6. OVERALL ASSESSMENT OF THE DATA

Table 6 presents a summary of sample results which have been qualified as described in the report.

## 7. REFERENCES

USEPA, 1990. Contract Laboratory Program 3/90 Inorganic Statement of Work.

USEPA, 1988. "Laboratory Data Validation - Functional Guidelines for Evaluation Inorganics Analyses", U.S. Environmental Protection Agency, Hazardous Site Evaluation Division. July 1, 1988.

ATTACHMENTS

TABLE 1 - EXCEEDED HOLDING TIMES
TABLE 2 - CALIBRATION OUTLIERS
TABLE 3 - MATRIX SPIKE RECOVERY OUTLIERS
TABLE 4 - SAMPLE DUPLICATE OUTLIERS
TABLE 5 - BLANK OUTLIERS
TABLE 6 - QUALFIED DATA SUMMARY TABLE

# EXCEEDED HOLDING TIMES
# INORGANIC COMPOUNDS
# CLP SOW – 2/88

PREPARED BY: D. Godfrey

DATE: 12-30-91

LANL MOUND PROJECT

LABORATORY BATCH # ~~ITAS ST LOUIS~~ - 1530 -

OPERABLE UNIT NO.:

LABORATORY NAME/LOCATION: ITAS - ST LOUIS

COLLECTION DATE(s): 8-28 29-91

| LABORATORY SAMPLE ID | MOUND SAMPLE ID | DATE COLLECTED | DATE ANALYZED | NUMBER OF DAYS PAST HOLDING TIME |
|---|---|---|---|---|
| | | | | |
| | All samples were analyzed within the required holding time | | | |

# CALIBRATION OUTLIERS
# INORGANIC COMPOUNDS
# CLP SOW – ILM 01.0

PREPARED BY: D. Godfrey

DATE: 12-20-91

LANL MOUND PROJECT

LABORATORY BATCH #: 1530

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITAS-STLOUIS

COLLECTION DATE(s): 8-28,29-91

INITIAL CALIBRATION SOURCE: SPEX

CONTINUING CALIBRATION SOURCE: SPEX

| ANALYTE | INITIAL CALIBRATION TRUE | INITIAL CALIBRATION FOUND | INITIAL CALIBRATION %R(1) | CONTINUING CALIBRATION TRUE | CONTINUING CALIBRATION FOUND | CONTINUING CALIBRATION %R(1) | CONTINUING CALIBRATION FOUND | CONTINUING CALIBRATION %R(1) | M |
|---|---|---|---|---|---|---|---|---|---|
| ALUMINUM | | | | | | | | | |
| ANTIMONY | | | | | | | | | |
| ARSENIC | | | | | | | | | |
| BARIUM | No outliers observed | | | | | | | | |
| BERYLLIUM | | | | | | | | | |
| CADMIUM | | | | | | | | | |
| CALCIUM | | | | | | | | | |
| CHROMIUM | | | | | | | | | |
| COBALT | | | | | | | | | |
| COPPER | | | | | | | | | |
| IRON | | | | | | | | | |
| LEAD | | | | | | | | | |
| MAGNESIUM | | | | | | | | | |
| MERCURY | | | | | | | | | |
| NICKEL | | | | | | | | | |
| POTASSIUM | | | | | | | | | |
| SELENIUM | | | | | | | | | |
| SILVER | | | | | | | | | |
| SODIUM | | | | | | | | | |
| THALLIUM | | | | | | | | | |
| VANADIUM | | | | | | | | | |
| ZINC | | | | | | | | | |
| CYANIDE | | | | | | | | | |

ASSOCIATED SAMPLES:

REVIEWER INITIALS: DJG

DATE: 12-20-91

(1) CONTROL LIMITS: MERCURY 80–120; OTHER METALS 90–110; CYANIDE 85–115

# MATRIX SPIKE RECOVERY OUTLIERS
# INORGANIC COMPOUNDS
# CLP SOW – ILM 01.0

PREPARED BY: D. Godfrey

DATE: 12-20-91

LABORATORY BATCH #: 1530

LABORATORY NAME/LOCATION: ITAS-ST LOUIS

LANL MOUND PROJECT

OPERABLE UNIT NO.:

COLLECTION DATE(s): 8-28, 29-91

QC LIMITS
75 - 125% RECOVERY

| LABORATORY SAMPLE ID | MOUND SAMPLE ID | | Cd | Se | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1530-010 | 23-1001 | | 65.1 | 70.3 | | | | | |

# SAMPLE DUPLICATE (REPLICATE) OUTLIERS
# INORGANIC COMPOUNDS
# CLP SOW – ILM 01.0 (% RPD)

PREPARED BY: D. Godfrey

DATE: 10-20-91

LABORATORY BATCH #: 1530

LABORATORY NAME/LOCATION: ITAS-ST LOUIS

LANL MOUND PROJECT

OPERABLE UNIT NO.:

COLLECTION DATE(s): 8-28, 29-91

* ACCEPTANCE CRITERIA

IF RESULT ≥ 5 X CRDL: ± 20% RPD

IF RESULT ≤ 5 X CRDL: ± CRDL

| LABORATORY SAMPLE ID | MOUND SAMPLE ID | Pb | Ca | Mg | Ba | | |
|---|---|---|---|---|---|---|---|
| 1530-010 | 23-1001 | 25.1 | | | | | |
| * 1530-005 | 19-1001 | | 73.1 | 67.3 | | | |
| * 1530-010 | 23-1001 | | | | 65.6 | | |

* Field dups - ± 35% for Soils

# BLANK OUTLIERS
# INORGANIC COMPOUNDS
# CLP SOW – ILM 01.0

PREPARED BY: D. Godfrey

DATE: 2-26-91

LANL MOUND PROJECT

LABORATORY BATCH #: 630

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITAS - BTLCUES

COLLECTION DATE(s): 8-28,29-91

PREPARATION BLANK MATRIX (SOIL/WATER): WATER
samples are soils

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): UG/L

| ANALYTE | INITIAL CALIB. BLANK (UG/L) | C | CONTINUING CALIBRATION BLANK (UG/L) 1 | C | 2 | C | 3 | C | PREPARATION BLANK | C | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALUMINUM | | | | | | | | | | | |
| ANTIMONY | | | | | | | | | 48.65 | B | P |
| ARSENIC | | | | | | | | | | | |
| BARIUM | | | 1.0 ✓ | B | | | 1.0 | B | 1.01 | B | P |
| BERYLLIUM | | | | | | | | | | | |
| CADMIUM | | | | | | | 4.2 | B | | | P |
| CALCIUM | | | 3.9 | B | 6.6 | B | | | 18.72 | B | P |
| CHROMIUM | | | | | | | -3.2 | B | | | P |
| COBALT | 4.1 | B | | | | | | | 4.11 | B | P |
| COPPER | 4.5 | B | 3.0 | B | 6.0 ✓ | B | 3.3 | B | 3.00 | B | P |
| IRON | 7.2 | B | 7.7 | B | 16.7 ✓ | B | | | 5.13 | B | P |
| LEAD | | | | | | | 1.0 | B | 1.43 | B | F |
| MAGNESIUM | | | 1.3 | B | 1.3 | B | | | 14.06 | B | |
| MANGANESE | | | | | | | | | | | |
| MERCURY | | | | | | | | | | | |
| NICKEL | | | | | | | | | | | |
| POTASSIUM | | | | | | | | | | | |
| SELENIUM | | | | | | | | | | | |
| SILVER | 2.6 | B | | | 6.4 | B | | | | | P |
| SODIUM | | | | | | | | | 148.92 | B | P |
| THALLIUM | | | | | | | | | | | |
| VANADIUM | | | | | | | | | | | |
| ZINC | | | 2.5 | B | | | | | 2.76 | B | P |
| CYANIDE | | | | | | | | | | | |
| ASSOCIATED SAMPLES | All Samples | | PB/LCS | | 16-0001 17-0001 | | 19-0001, 20-0001, 21-0001, 22-0001 | | All Samples | | |
| | | | 16-0001, 17-0001, 18-0001, 19-0001 | | 18-001, 19-0001 | | ~~23-0001, 23-0001~~ ~~24-0001~~ | | | | |
| | | | | | ~~19-0001, 22-0001~~ ~~21-0001, 22-0001~~ | | (PB) 16-0001 17-0001, 21-0001 | | | | |
| | All samples | | (PB) PB, LCS | | (PB) PB, LCS | | | | | | |

# BLANK OUTLIERS
# INORGANIC COMPOUNDS
# CLP SOW – ILM 01.0

PREPARED BY: D. Godfrey

DATE: 12-20-91

LANL MOUND PROJECT

LABORATORY BATCH #: 1530

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITAS-ST LOUIS

COLLECTION DATE(s): 8-28, 29-91

PREPARATION BLANK MATRIX (SOIL/WATER): WATER

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): UG/L

| ANALYTE | INITIAL CALIB. BLANK (UG/L) | C | CONTINUING CALIBRATION BLANK (UG/L) 1 | C | 2 | C | 3 | C | PREPARATION BLANK | C | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALUMINUM | | | | | | | | | | | |
| ANTIMONY | | | | | | | | | | | |
| ARSENIC | | | | | | | | | | | |
| BARIUM | | | | | | | | | | | |
| BERYLLIUM | | | | | | | | | | | |
| CADMIUM | | | | | | | | | | | |
| CALCIUM | | | | | | | | | | | |
| CHROMIUM | | | | | | | | | | | |
| COBALT | | | | | | | | | | | |
| COPPER | | | | | | | | | | | |
| IRON | | | | | | | | | | | |
| LEAD | | | 1.4 | B | | | | | | | F |
| MAGNESIUM | | | | | | | | | | | |
| MANGANESE | | | | | | | | | | | |
| MERCURY | | | | | | | | | | | |
| NICKEL | | | | | | | | | | | |
| POTASSIUM | | | | | | | | | | | |
| SELENIUM | | | | | | | | | | | |
| SILVER | | | | | | | | | | | |
| SODIUM | | | | | | | | | | | |
| THALLIUM | | | | | | | | | | | |
| VANADIUM | | | | | | | | | | | |
| ZINC | | | | | | | | | | | |
| CYANIDE | | | | | | | | | | | |
| ASSOCIATED SAMPLES | | | (Pb) 20-0001 | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

# BLANK OUTLIERS
# INORGANIC COMPOUNDS
# CLP SOW – ILM 01.0

PREPARED BY: DJE

DATE: 2-20-91

LANL MOUND PROJECT

LABORATORY BATCH #: 1530

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: ITAS - STOUTS

COLLECTION DATE(s): 8-23, 21-91

PREPARATION BLANK MATRIX (SOIL/WATER): WATER

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): UG/L

| ANALYTE | INITIAL CALIB. BLANK (UG/L) | C | CONTINUING CALIBRATION BLANK (UG/L) 1 | C | 2 | C | 3 | C | PREPARATION BLANK | C | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALUMINUM | | | | | | | | | | | |
| ANTIMONY | | | | | | | | | | | |
| ARSENIC | | | | | | | | | | | |
| BARIUM | | | | | | | 1.1 | B | | | P |
| BERYLLIUM | | | | | | | | | | | P |
| CADMIUM | | | | | 4.5 | B | | | | | |
| CALCIUM | | | | | 8.2 | B | 13.0 | B | | | P |
| CHROMIUM | | | | | | | | | | | |
| COBALT | | | 6.2 | B | | | 4.6 | B | | | P |
| COPPER | | | 3.0 | B | 4.5 | B | 6.0 | B | | | P |
| IRON | | | | | | | 6.9 | B | | | P |
| LEAD | | | | | 1.2 | B | 1.1 | B | | | F |
| MAGNESIUM | | | | | 1.3 | B | 3.3 | B | | | P |
| MANGANESE | | | | | | | | | | | |
| MERCURY | | | | | | | | | | | |
| NICKEL | | | | | | | -17.4 | B | | | P |
| POTASSIUM | | | | | | | | | | | |
| SELENIUM | | | | | | | | | | | |
| SILVER | | | 7.8 | B | | | 4.3 | B | | | P |
| SODIUM | | | | | 16.9 | B | 15.8 | B | | | P |
| THALLIUM | | | | | | | | | | | |
| VANADIUM | | | | | | | | | | | |
| ZINC | | | 2.1 | B | 2.1 | B | 3.8 | B | | | P |
| CYANIDE | | | | | | | | | | | |
| ASSOCIATED SAMPLES | | | 19-1001, 20-0001, 21-0001, 22-0001 | | 23-0001, 23-1001, 24-0001 | | All samples | | | | |
| | | | 23-0001, 23-1001, 24-0001 | | | | | | | | |
| | | | (PD) 16-0001, 17-0001, 18-0001, 19-0001 | | (PD) 19-0001, 19-1001, ~~20-0001~~, 24-0001 | | (PD) 20-0001, 23-0001, 23-1001 | | | | |
| | | | 19-1001, 20-0001, 22-0001 | | 21-0001, 22-0001, 23-0001, 23-1001, 24-0001 | | 24-0001 | | | | |

# BLANK OUTLIERS
# INORGANIC COMPOUNDS
# CLP SOW – ILM 01.0

PREPARED BY: D. Godfrey

DATE: 12-20-91

LANL MOUND PROJECT

LABORATORY BATCH #: 1630

OPERABLE UNIT NO.: _____

LABORATORY NAME/LOCATION: STAS - ST LOUIS

COLLECTION DATE(s): 8-28,29-91

PREPARATION BLANK MATRIX (SOIL/WATER): WATER
samples are soils.

PREPARATION BLANK CONCENTRATION UNITS (UG/L OR MG/KG): UG/L

| ANALYTE | INITIAL CALIB. BLANK (UG/L) | C | CONTINUING CALIBRATION BLANK (UG/L) 1 | C | 2 | C | 3 | C | PREPARATION BLANK | C | M |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALUMINUM | | | | | | | | | | | |
| ANTIMONY | | | | | | | | | 43.65 | B | P |
| ARSENIC | | | | | | | | | | | |
| BARIUM | | | 2.0 ✓ | B | | | 1.0 | B | 1.01 | B | P |
| BERYLLIUM | | | | | | | | | | | |
| CADMIUM | | | | | | | 4.2 | B | | | P |
| CALCIUM | | | 3.9 | B | 6.6 | B | | | 18.72 | B | P |
| CHROMIUM | | | | | | | -3.2 | B | | | P |
| COBALT | 4.1 | B | | | | | | | 4.11 | B | P |
| COPPER | 4.5 | B | 3.0 | B | 6.0 ✓ | B | 3.8 | B | 3.00 | B | P |
| IRON | 7.2 | B | 7.7 | B | 10.7 ✓ | B | | | 5.13 | B | P |
| LEAD | | | | | | | 1.0 | B | 1.43 | B | F |
| MAGNESIUM | | | 1.3 | B | 1.3 | B | | | 14.06 | B | |
| MANGANESE | | | | | | | | | | | |
| MERCURY | | | | | | | | | | | |
| NICKEL | | | | | | | | | | | |
| POTASSIUM | | | | | | | | | | | |
| SELENIUM | | | | | | | | | | | |
| SILVER | 2.6 | B | | | 6.4 | B | | | | | P |
| SODIUM | | | | | | | | | 148.92 | B | P |
| THALLIUM | | | | | | | | | | | |
| VANADIUM | | | | | | | | | | | |
| ZINC | | | 2.5 | B | | | | | 2.76 | B | P |
| CYANIDE | | | | | | | | | | | |
| ASSOCIATED SAMPLES | All samples | | PB/LCS | | 16-0001, 17-0001 | | 19-0001, 20-0001, 21-0001, 22-0001 | | All samples | | |
| | | | 16-0001, 17-0001, 18-0001, 19-0001 | | 18-001, 19-0001 | | ~~23-0001, 25-0001~~ ~~24-0001~~ | | | | |
| | | | | | ~~19-0001, 20-0001~~ ~~21-0001, 22-0001~~ | | (PB) 16-0001 17-0001 | | | | |
| | All samples | | (PB) PB, LCS | | (PB) PB, LCS | | | | | | |

# QUALIFIED DATA SUMMARY TABLE
# INORGANIC COMPOUNDS

**PREPARED BY:** H. Seeley

**DATE:** 3/3/92

**LANL MOUND PROJECT**

**LABORATORY BATCH #:** REA 37051

**OPERABLE UNIT NO.:** 3

**LABORATORY NAME/LOCATION:** ITAS - St. Louis

**COLLECTION DATE(s):** 8/28, 29/91

| ANALYTE | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID |
|---|---|---|---|---|---|
| | MM33-0016-0001 | MM33-0017-0001 | MM33-0018-0001 | MM33-0019-0001 | MM33-0020-0001 |
| ALUMINUM | | | | | |
| ANTIMONY | 6.1 U | | | | |
| ARSENIC | 10.5 J | | | | |
| BARIUM | | | | | 31.3 J |
| BERYLLIUM | | | | | |
| CADMIUM | 0.5 UJ | 0.52 UJ | 0.51 UJ | 0.48 UJ | 0.47 UJ |
| CALCIUM | 53700 J | 15300 J | 11300 J | 26200 J | |
| CHROMIUM | | | | | |
| COBALT | | | | | |
| COPPER | 20.4 J | 26.0 J | 20.2 J | 28.0 J | 11.9 J |
| IRON | 25100 J | 34100 J | 33200 J | 30000 J | 11500 J |
| LEAD | | | | | |
| MAGNESIUM | 16000 J | 8600 J | 5560 J | 8940 J | |
| MERCURY | | | | | |
| NICKEL | 22.1 J | 28.2 J | 22.0 J | 20.3 J | 11.7 J |
| POTASSIUM | | | | | |
| SELENIUM | 1.7 J | 1.9 J | 1.6 J | 1.4 J | 0.12 UJ |
| SILVER | 0.62 U | 0.94 U | 0.38 UJ | 0.86 U | 0.46 U |
| SODIUM | | | | | |
| THALLIUM | | | | | |
| VANADIUM | | | | | |
| ZINC | | | | | |
| CYANIDE | | | | | |
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**REVIEWER INITALS:** _____

**DATE:** _____

# QUALIFIED DATA SUMMARY TABLE
# INORGANIC COMPOUNDS

**PREPARED BY:** H. Starley

**DATE:** 3/3/92

**LABORATORY BATCH #:** REA 37051

**LABORATORY NAME/LOCATION:** ITAS - St. Louis

**LANL MOUND PROJECT**

**OPERABLE UNIT NO.:** 3

**COLLECTION DATE(s):** 8/28, 29/91

| ANALYTE | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID |
|---|---|---|---|---|---|
| | MW33-0016-0001 | MW33-0017-0001 | MW33-0018-001 | MW33-0019-0001 | MW33-0020-0001 |
| ALUMINUM | | | | | |
| ANTIMONY | 6.1 U | | | | |
| ARSENIC | 10.5 J | | | | |
| BARIUM | | | | | 31.3 J |
| BERYLLIUM | | | | | |
| CADMIUM | 0.5 UJ | 0.52 UJ | 0.51 UJ | 0.48 UJ | 0.47 UJ |
| CALCIUM | 53700 J | 15300 J | 11300 J | 26200 J | |
| CHROMIUM | | | | | |
| COBALT | | | | | |
| COPPER | 20.4 J | 26.0 J | 20.2 J | 28.0 J | 11.9 J |
| IRON | 25100 J | 34100 J | 33200 J | 30000 J | 11500 J |
| LEAD | | | | | |
| MAGNESIUM | 16000 J | 8600 J | 5560 J | 8940 J | |
| MERCURY | | | | | |
| NICKEL | 22.1 J | 28.2 J | 22.0 J | 20.3 J | 11.7 J |
| POTASSIUM | | | | | |
| SELENIUM | 1.7 J | 1.9 J | 1.6 J | 1.4 J | 0.12 UJ |
| SILVER | 0.62 U | 0.94 U | 0.38 UJ | 0.86 U | 0.46 U |
| SODIUM | | | | | |
| THALLIUM | | | | | |
| VANADIUM | | | | | |
| ZINC | | | | | |
| CYANIDE | | | | | |
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**REVIEWER INITALS:** _____

**DATE:** _____

# QUALIFIED DATA SUMMARY TABLE
# INORGANIC COMPOUNDS

**PREPARED BY:** H. Seeley

**DATE:** 3/7/92

**LABORATORY BATCH #:** LEA 37051

**LABORATORY NAME/LOCATION:** FTAS - St. Louis

**LANL MOUND PROJECT**

**OPERABLE UNIT NO.:** 3

**COLLECTION DATE(s):** 2/25, 29/92

| ANALYTE | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID |
|---|---|---|---|---|---|
| | MW033-0021-0001 | MW033-0022-0001 | MW033-0023-0001 | MW033-0024-0001 | |
| ALUMINUM | | | | | |
| ANTIMONY | | 7.5 U | 6.5 U | | |
| ARSENIC | | | | | |
| BARIUM | 66.3 J | 69.6 J | 101 J | 40.7 J | |
| BERYLLIUM | | | | | |
| CADMIUM | 0.40 UJ | 0.45 UJ | 0.45 UJ | 0.41 UJ | |
| CALCIUM | | | | | |
| CHROMIUM | | | | | |
| COBALT | | | | | |
| COPPER | 11.2 J | 15.1 J | 11.6 J | 13.4 J | |
| IRON | 11900 J | 14600 J | 10400 J | 14600 J | |
| LEAD | | | | | |
| MAGNESIUM | | | | | |
| MERCURY | | | | | |
| NICKEL | 9.7 J | 12.1 J | 12.3 J | 12.7 J | |
| POTASSIUM | | | | | |
| SELENIUM | 0.10 UJ | 0.12 J | 0.12 UJ | 0.11 UJ | |
| SILVER | 0.30 UJ | 0.34 UJ | 0.34 UJ | 0.57 U | |
| SODIUM | | | | | |
| THALLIUM | | | | | |
| VANADIUM | | | | | |
| ZINC | | | | | |
| CYANIDE | | | | | |
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**REVIEWER INITALS:** _____

**DATE:** _____

# QUALIFIED DATA SUMMARY TABLE
# INORGANIC COMPOUNDS

PREPARED BY: H. Sirley

DATE: 3/3/92

LABORATORY BATCH #: RCA 37051

LABORATORY NAME/LOCATION: FTS-St. Louis

LANL MOUND PROJECT

OPERABLE UNIT NO.: 3

COLLECTION DATE(s): 8/28-29/92

| ANALYTE | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID | MOUND SAMPLE ID |
|---|---|---|---|---|---|
| | MM133-0019-1001 | MM133-0023-1001 | | | |
| ALUMINUM | | | | | |
| ANTIMONY | | | | | |
| ARSENIC | | | | | |
| BARIUM | | 51.1 J | | | |
| BERYLLIUM | | | | | |
| CADMIUM | 0.51 UJ | 0.43 UJ | | | |
| CALCIUM | | | | | |
| CHROMIUM | | | | | |
| COBALT | | | | | |
| COPPER | 38.2 J | 10.6 J | | | |
| IRON | 26500 J | 10700 J | | | |
| LEAD | | | | | |
| MAGNESIUM | 18000 J | | | | |
| MERCURY | | | | | |
| NICKEL | 23.0 J | 13.0 J | | | |
| POTASSIUM | | | | | |
| SELENIUM | 1.7 J | 0.11 UJ | | | |
| SILVER | 0.83 U | 0.32 UJ | | | |
| SODIUM | | | | | |
| THALLIUM | | | | | |
| VANADIUM | | | | | |
| ZINC | | | | | |
| CYANIDE | | | | | |
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REVIEWER INITALS: _____

DATE: _____