0305- 3/15/93-00858

DEPARTMENT OF THE NAVY

ATLANTIC DIVISION, NAVAL FACILITIES ENGINEERING COMMAND

NORFOLK, VIRGINIA

WORK PLAN

FOR

SITES 15 & 16

AT THE

NAVAL STATION, ROOSEVELT ROADS, PUERTO RICO

PREPARED BY:

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March 15, 1993

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Section 1
INTRODUCTION

This Work Plan, and the accompanying drawings and specifications, detail the activities and requirements necessary to accomplish remediation of soil and sediment impacted with polychlorinated biphenyls (PCBs) at Sites 15 and 16, Naval Station Roosevelt Roads, Puerto Rico. This Work Plan has been prepared based on information developed during previous activities conducted at these two sites including:

- Preliminary Assessment/ Site Investigation (PA/SI) (Initial Assessment), Greenleaf/Telesca, 1984
- Remedial Action Alternatives Analysis, ESE, 1988
- Remedial Investigation/ Feasibility Study (RI/FS) (Soil/Sediment Operable Unit), Versar, 1992

In addition, as one of the tasks involved in preparing this Work Plan, an evaluation of the applicability of a soil screening technique was conducted. The results of that evaluation are detailed in:

- Comparison of Soil Values of Aroclor 1260 using a Dexsil L2000 PCB/Chloride Analyzer and SW846 Method 8080, Metcalf & Eddy, 1992 (see Appendix A)

Field sampling, decontamination procedures, and analytical methods described in this Work Plan are based upon EPA Region II Quality Assurance Manual, October 1989 and EPA Guidance Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup. A job-specific Quality Assurance Project Plan and Health and Safety Plan based upon the above documents will be prepared prior to the commencement of field activities.

Project Background and Objectives

Site 15 (Substation No. 2, Building 90), is under the jurisdiction of the Power Distribution Shop. From 1964 until 1979, as part of the maintenance of the transformers, it was routine practice to drain or pour transformer oil onto the ground at the work location. Site 16 (Old Power Plant, Building 38), also under the jurisdiction of the Power Distribution Shop, was a 60-megawatt steam turbine facility that generated power from the early 1940s through 1949. From 1956 to 1964, transformer maintenance was performed at this site. As part of the maintenance, transformer oil was reportedly drained onto the ground, primarily in the immediate vicinity of the building. (Versar, 1992).

Investigations at Sites 15 and 16 have revealed areas of surficial soil and sediments which contain PCBs, primarily Aroclor 1260, in excess of the Toxic Substance Control Act (TSCA) criteria for residual PCB in areas with unrestricted access. Because no samples of the underlying bedrock or groundwater have been reported to date, it is not known if any impacts from residual PCBs extend beyond the surficial soils or whether offsite migration has occurred.

The RI/FS prepared for these two sites (Versar, 1992) addressed only the soil/sediment operable unit, and concluded with the recommended remedial action of excavating soils and sediments from Sites 15 and 16 which exceed 10 ppm PCBs followed by shipment and disposal at a permitted TSCA landfill in Beatty, Nevada.

The purpose of this Work Plan is to provide the details necessary to accomplish the removal, transport, and disposal of PCB-impacted soils from Sites 15 and 16. As part of the Work Plan preparation, the disposal option presented in the RI/FS was re-evaluated to identify the lowest cost transportation and disposal option. The results of that evaluation are included in Appendix B. This evaluation verified that transport and disposal of PCB contaminated soil by USEcology to their TSCA permitted landfill in Beatty, Nevada was the least expensive

and most viable option evaluated, and therefore, is included in this Work Plan as the selected option.

The accompanying drawings and specifications provide most of the details for the removal action. The drawings include the existing site plans, laydown area plan, excavation plans, erosion and sediment control plans, final grading plans, and sample collection plans. This document provides the basic framework for the project and supplements the drawings and specifications with additional information on site conditions, project organization, contractor training and health and safety requirements, construction activities, soil screening and confirmation analyses during the excavation activities, decontamination procedures, transportation and disposal requirements for PCB-impacted soil, overall project schedule, and quality assurance/quality control activities.

Site Conditions

Naval Station Roosevelt Roads is located at the eastern end of the island of Puerto Rico, approximately 35 miles east of San Juan, as shown on Drawing C-1. Sites 15 and 16 are located on the northeastern side of Ensenada Honda, also shown on Drawing C-1.

Site 15. Site 15 consists of Building 90 and two fenced-in areas containing electrical transformers located on a narrow strip of grass between Valley Forge Road and a steep hillside which parallels Valley Forge Road (see Drawing C-3). Several telephone/utility poles traverse the site from northeast to southwest, parallel to Valley Forge Road. Also, there are five raised concrete electrical manholes and a storm drain that are part of the base underground electrical and storm sewer system.

Small stands of trees are present at the base of the hillside on the western side of the site. Drainage swales are present along the length of the eastern, western, and southern margins of the site. The drainage that is present along the western margin below the trees is not as well defined a swale as are the other two swales. Water accumulating against the base of the

hillside is channeled to the south by the natural gradient; however, the swale has no pronounced channel south of the hill. The drainage swale along Forrestal Drive at the southern margin flows eastward and the swale parallel to Valley Forge Road flows southward and discharge into a grated stormwater drain in the southeast corner of the site.

An area of approximately 1,230 square yards of soil impacted with PCBs has been identified as needing remedial action at Site 15 (see Drawing C-9). The area of impacted soil is located adjacent to Building 90 and the larger fenced area, along the drainage swale running beside Valley Forge Road, in an area around the smaller fenced area, and in an isolated area between the two fenced areas. The soil underlying the areas consists of a thin layer of beach deposits and alluvium overlying weathered volcanic rock. This volcanic rock also makes up the steep hillside to the northwest of the site.

A test pit (TP 15-1) excavated approximately 140 feet northeast of Building 90 encountered about 2 feet of alluvial material overlain by a layer of sandy beach deposits about 4 inches thick. Underlying the alluvial material was a highly weathered saprolitic zone of volcanic rock which grades into less weathered material with depth. The test pit log is included in Appendix B. The location of test pit TP 15-1 is shown on Drawing C-15.

The thickness of the soil zone impacted with PCBs has not been defined. However, due to the low mobility of PCBs in soil, and the presence of a clay-rich saprolite in the shallow subsurface, it is anticipated that only the surficial soils to a depth of about 1 foot below grade need to be removed. Assuming the removal of an average of 1 foot of soil, the estimated volume of material to be removed from Site 15 is approximately 405 cubic yards inplace, which could result in a volume of up to 510 cubic yards with an estimated weight of 550 tons when removed for disposal.

Site 16. Site 16 consists of Building No. 38, (Old Power Plant) and the surrounding area, which includes a former transformer pad (substation) and two 50,000-gallon USTs covered by a large concrete cover (see Drawing C-4). A broad concrete apron surrounds the Old

Power Plant. Building 38 is a massive two-story structure nestled tightly against a niche carved into the hillside. At the base of the hillside is a concrete-lined drainage ditch, which collects drainage from the surrounding concrete apron. The ditch borders the edge of the concrete apron surrounding Building 38 and the concrete pad covering the USTs. The drainage ditch directs runoff into a storm drain located in the northern part of the site. The ditch also flows between the pad covering the USTs and the former substation area. Large amounts of sediments, debris, and plant matter clog the channels of the ditch, thereby limiting flow. Vines have largely overgrown the channel and the concrete apron between the hillside and Building 38. There is a small fence at the southeast end of Building 38 and remnants of a chain-link fence surrounding parts of the former substation area in the northern part of the site.

The southern and eastern parts of the site are largely open areas. The south and east sides of the site are bounded by a paved road. Gravel has been spread along the shoulder of the road and in the open area in front of Building 38 (to create a turnout/parking area). In the southern part of the site, the gravel generally gives way to grass. There is a large area of bare soil (sparsely vegetated) between the gravel turnout and a stand of small trees and shrubs in the northeast corner of the site.

Several access panels which allow entry into the cooling water inlet and outfall tunnels are located in the site area. These access panels are in poor repair and present a potential safety concern which must be protected during the remedial activities.

An area of approximately 3050 square yards of PCB-impacted soil and sediment has been identified as needing remedial action. Most of the impacted soil is located to the south and east of Building 38 and extends to the road in both directions (see Drawing C-10). An additional area of impacted sediment which must be removed is located in the concrete-lined drainage swales along the northern and western sides of the concrete apron surrounding Building 38.

A test pit (TP 16-1) was excavated approximately 60 feet south of Building 38 (see Drawing C-16). This test pit encountered a layer of sandy beach deposits approximately 1 foot thick overlying a clay-rich saprolitic zone developed on underlying dioritic rock. The test pit log is included as Appendix C.

The thickness of the soil zone impacted with PCBs has not been defined. However, due to the low mobility of PCBs in soil and the presence of a clay-rich saprolite in the shallow subsurface, it is anticipated that only the surficial soils to a depth of about 1 foot below grade need to be removed. Assuming the removal of an average of 1 foot of soil, the estimated volume of soil to be removed from Site 16 is approximately 1,015 cubic yards inplace, which could result in a volume of up to 1,250 cubic yards with an estimated weight of 1,370 tons when removed for disposal.

Sensitive Species

As part of the site work involved in preparing this Work Plan, an evaluation of the potential for impacting any threatened or of-concern species was conducted by a qualified representative of Naval Station Roosevelt Roads. That evaluation indicated that the remedial actions planned at Sites 15 and 16 would have no adverse impacts on any threatened or of-concern species. A summary memorandum of that evaluation is included as Appendix D.

Section 2
PROJECT ORGANIZATION

This section of the Work Plan describes the project organization for the remedial actions for PCB-impacted soils and sediment at Sites 15 and 16, identifies the various types of contractors which will be involved, and identifies some of the contractor training and health and safety requirements. All contractors involved in the project must be approved by the project Naval Technical Representative.

Project Organization

In overview, the project consists of clearing approximately 800 cubic yards of cut plant material and site debris from Sites 15 and 16, transporting this material to a local landfill, excavating a total of approximately 1,920 tons (1760 cubic yards) of PCB-impacted soils from Sites 15 and 16, loading this soil into an estimated 120 intermodal containers, verifying that the remedial action has achieved the required cleanup levels, transporting the intermodal containers to the USEcology TSCA-approved landfill in Beatty, Nevada, and disposing of the soil at that location. In addition, other activities specific to the excavation contractor such as temporary erosion control, site preparation, backfill and final grading and site control, necessary to complete the project will be required. Contractors to be involved in these activities are:

An oversight contractor, whose responsibilities include:

- Overall project responsibility, including subcontracting and project management
- Obtaining required permits from the Naval Station and local landfills
- Interfacing with the Naval Technical Representatives (NTR) and base personnel
- Interfacing with Puerto Rico Environmental Quality Board (EQB)

- Preparation of the project-specific Health and Safety Plan
- Preparation of the project-specific Quality Assurance Project Plan
- Site Health and Safety Monitoring
- Construction management
- Coordinating submittals to the Navy
- Soil sampling and screening analyses
- Manifest preparation
- Project completion report and documentation

An excavation contractor, whose responsibilities include:

- Site clearing and preparation
- Sediment and erosion control plan implementation
- Laydown area preparation
- Excavation of PCB-impacted soil
- Loading intermodal containers and staging containers at the laydown area
- Placing and grading backfill
- Equipment decontamination
- Site restoration and reseeding

A transport and disposal contractor, identified as USEcology, whose responsibilities include:

- Transporting the empty intermodal containers to Naval Station Roosevelt Roads
- Transporting the filled intermodal containers from Naval Station Roosevelt Roads to their facility in Beatty, Nevada
- Disposing of the PCB-impacted soil at their TSCA-approved facility
- Decontamination of the used intermodal containers
- Preparation of the required soil disposal documentation

An analytical laboratory, whose responsibilities include:

- Analyzing confirmation soil samples
- Prepare Laboratory Quality Assurance/Quality Control Plan
- Prepare analytical reports

A local hauling contractor, whose responsibilities include:

- Hauling cut plant material and site debris to a local landfill
- Providing and delivering suitable borrow material for backfill of the excavations. Suitable is defined to include laboratory certification that the borrow material is free of PCB contamination (< 10 ppm) and below TCLP metals action levels.

A detailed preliminary project schedule showing how the various activities are related is included in Section 7 of this Work Plan.

Contractor Training and Health and Safety Requirements

Due to the nature of the materials to be excavated and handled during the remedial activities at Sites 15 and 16, certain training requirements and Health and Safety (H&S) procedures will be necessary. Various contractors will perform separate activities which will result in different levels of risk associated with exposure to PCB-impacted soils. Therefore, different training requirements can be established for the various contractors based on the type of activity being performed. Contractors performing low-risk functions such as hauling site debris and cut shrubs to the local landfill will not require the same level of training or H&S procedures as contractors directly involved in the excavation, handling, and testing of the PCB-impacted soils.

Prior to initiating any site activities, a project-specific Health and Safety Plan (HSP) must be prepared. This HSP will identify in detail the training and H&S requirements for each activity and contractor involved in the project. It is anticipated that the oversight, transportation and disposal, excavation, and laboratory contractors will need to meet the requirements defined in OSHA 29 CFR 1910.120. Contractors involved in low risk activities such as transport of non-impacted site debris, surveying, etc., may not have to meet all of the same requirements. Government employees will follow the Contractor's HSP and the Contractor will provide two sets of personal protective equipment for government employees.

Section 3
CONSTRUCTION ACTIVITIES

This section describes activities involved in the Construction related phases of the remedial action at Sites 15 and 16. These activities include Site Preparation, Sediment and Erosion Control, Laydown Area Preparation, Site Access and Control, Excavation, Loading and Staging of PCB-impacted Soil, Site Restoration and Cleanup. The information contained in this section supplements the details and requirements included in the accompanying drawings and specifications. Prior to any site activities, all necessary permits from the Base Resident Officer In Charge of Construction (ROICC) and Public works must be obtained by the oversight contractor.

Construction Permits

Permits required for the construction project include:

1) Good Conduct Permit (Issued by Local Police)
2) Personnel Gate Pass
3) Vehicular Gate Pass
4) Digging Permit
5) Road Closure Permit
6) EQB Solid Waste Permit
7) EQB Hazardous Waste Permit

Site Preparation

Prior to excavation of PCB-impacted soils at Sites 15 and 16 the laydown area and the Sites must be brought into condition suitable for excavation. One of the initial activities will be mobilizing and setting up a project office trailer which will be located at a suitable site near the laydown area. Temporary utilities such as electrical power, water, and sanitary facilities

must be arranged and installed. In addition, water, power, and sanitary facilities will be provided at each site as necessary. Any required signs must be erected.

All site debris and vegetation within or near the areas to be excavated must be removed. Vegetation will be cut as close to the ground surface as practical. The cut vegetation will be handled in such a manner as to avoid contact with the PCB-contaminated soil. The approximate extent of areas that need to be cleared is shown on Drawings C-9 and C-10. All cut vegetation and site debris will be loaded and transported offsite to a local landfill. One composite sample per site will be screened for PCBs prior to disposal.

Sediment and Erosion Control

To prevent deleterious affects to areas adjacent to the laydown area and Sites 15 and 16, sediment and erosion control measures will be implemented. These measures are detailed on Drawings C-6, C-7, and C-8. Sediment and Erosion Control will be an ongoing activity beginning prior to any site excavation or grading and continuing until the completion of backfilling and reseeding. Sediment and Erosion Control structures are shown in their approximate location on C-6, C-7, and C-8. Their exact location shall be field determined. These structures will have to be removed, relocated, and replaced as necessary to excavate, grade, and backfill these sites.

Laydown Area Preparation

Prior to delivery of the intermodal containers to Naval Station, Roosevelt Roads, the Laydown area must be prepared and fenced. Laydown area preparation will consist of grading and application of a gravel base as detailed on Drawing C-13. Once the intermodal containers arrive, they will be staged at the Laydown area in such a manner as to facilitate moving empty containers to the excavation site and return of the filled containers back to the Laydown area to await transport to the TSCA approved landfill.

Site Access and Control

To prevent public contact with potentially PCB-impacted soils during excavation and to maintain site control, temporary fencing, road barricades and warning signs will be erected at the Laydown area and at Sites 15 and 16. Details of the temporary fencing, including the location of the construction entrances, are shown on Drawings C-6, C-7, and C-13. No vehicles except the excavation equipment and trucks used to haul the soil containers will be allowed inside the temporary fencing. At the completion of the excavation and backfilling activities, the fencing will be removed and any site restoration required as a result of the fencing will be completed.

Excavation, Loading and Staging of PCB Impacted Soil

Excavation of PCB-impacted soil from Sites 15 and 16 will involve removal of approximately 1 foot of soil from the areas identified on Drawings C-9 and C-10. After the area to be excavated is laid out, soil will be removed by areas to facilitate screening and confirmation analyses, as described in Section 4. Recommended excavation area plans are shown on Drawings C-15 and C-16. However, actual conditions may require some modification to the recommended excavation areas.

Excavation should begin in those areas most distant from the temporary construction entrances (TCE) shown on Drawings C-6 and C-7. Trucks carrying the intermodal containers will be loaded as close to the excavation areas as practical. Prior to leaving the site area, each truck and container will be decontaminated near the TCE following the procedures described in Section 5. Once decontaminated, the trucks will return the filled containers to the Laydown area.

Excavated areas will not be backfilled until receipt of acceptable confirmation analyses. Preliminary confirmation results should be provided within 2 weeks of submittal to the

laboratory. Temporary cover by sheet plastic or an equivalent suitable material of excavated areas will be required during rain events or overnight.

Once an area has been verified as meeting the remedial requirements, backfilling and regrading can occur. Final grading elevations are shown on Drawings C-11 and C-12. Backfill will be obtained from a borrow site located off of Naval Station Roosevelt Roads. The subcontractor shall test the backfill material for PCBs and TCLP metals to assure that this material is not contaminated. At the completion of the excavation and regrading activities, all equipment used to accomplish these activities will be decontaminated as described in Section 5.

Site Restoration And Cleanup

After completion of all excavation activities, Sites 15 and 16 will be restored to a condition suitable to the Navy. Final grading and reseeding will be performed. Temporary fencing will be removed and all materials and debris associated with the construction activities will be cleaned up and removed.

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Section 4
FIELD SAMPLING PLAN

Field sampling and analyses to verify the effectiveness of the remedial action at Sites 15 and 16 will be required. Sampling and analysis will consist of Field Screening and Confirmation Analyses. After an area has been excavated to a depth of approximately 1 foot, a sampling grid will be laid out on 225 square foot spacing (maximum). Soil samples will be taken following protocols detailed later in this section. This sample will be split into two samples. One sample will be used for field screening and the other sample will be preserved and set aside for later confirmation analysis. The field screening sample will be analyzed using the field screening procedures detailed in the following section. If the field screening results are less than 3 ppm, then the excavated area will be assumed to be "clean" and the set aside sample will be sent for confirmatory analysis. If the field screening sample indicates results in excess of 3 ppm, then the area will be re-excavated to a depth of 1.5 feet and another cycle of field screening/confirmation sampling will take place. This cycle shall continue until a "clean" field screening result is obtained.

Field Screening

Vegetation samples will be taken from the vegetative material cleared from each site. This composite sample will be taken from the debris pile using clean gloves, mixed in a stainless steel bowl and then placed in an 8 oz pre-cleaned jar. The jar will be sealed and labeled and sent for analysis using Method 8080.

To help determine the extent of soils to be excavated at Sites 15 and 16, soils will be screened during excavation activities using a Dexsil L2000 PCB/chloride analyzer. Soil screening will facilitate field determinations of the extent of soil which is impacted with PCBs and needs to be removed. An evaluation of the effectiveness of the Dexsil analyzer in determining soils impacted with PCBs has been conducted at Sites 15 and 16. Based on the

results of that evaluation, the following procedures should be used while conducting the soil screening:

- All soil samples to be analyzed by the Dexsil analyzer must be prepared according to the manufacturer's requirements. Preparation involves subjecting a known volume of soil to an extraction process which converts any PCBs to chloride. The Dexsil analyzer has a chloride-specific electrode which measures the chloride content of the extract.
- The Dexsil Analyzer must be set in the Arochlor 1260 mode for analysis.
- All calibration procedures must be followed and documented.
- Soils at Sites 15 and 16 contain enough naturally occurring chloride to affect a response on the Dexsil analyzer. Therefore, a baseline response level needs to be established for on-site soils which do not contain PCBs. This baseline response level should be established daily using an extract prepared each day. The baseline response level should be checked periodically during the day. The original extract prepared each day can be used for this check.

Soil sample locations will be laid out on a maximum 225 square foot spacing (approximately 15 ft x 15 ft grid). Partial grid sections will also be sampled with the purpose of providing a "clean" perimeter to the excavation. Example sample locations are shown on Drawings C-15 and C-16.

Locations of all soil samples collected must be clearly marked on the field drawings and recorded in a field logbook. Detailed records of all screening sample results must be maintained.

Soil sample collection methods are based upon EPA Interim Report EPA-560/5-88-017, "Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup." The sample area shall be laid out to cover approximately 200 cm^2. The soil should be scraped to a depth of about 1 cm with a stainless steel trowel, scoop or spatula to yield approximately 200 grams. This soil sample will be quartered and mixed in a stainless steel bowl and split into a field

screening sample and a confirmation sample. The samples will be placed into precleaned 8 oz. glass jar with a teflon cap and then stored under custody at 4°C. All jars will be provided by the laboratory and a decontamination certificate shall be provided for each batch of jars used.

All samples collected for confirmation analyses must be identified accurately and maintained chilled and under proper chain-of-custody requirements. Sample coolers will be sealed with a custody seal and shipped to the laboratory via overnight delivery. The samples submitted for confirmation analysis will be analyzed by Method 8080 as defined in EPA SW846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.

Samples will be analyzed to EPA Level IV Quality Assurance/Quality Control procedures. This will require the use of a variety of duplicate, blank, spike, MSDS, equipment rinsate and other types of samples. These exact Quality Control procedures will be detailed in the job-specific Quality Assurance Plan to be prepared prior to the commencement of field work.

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Section 5
DECONTAMINATION PROCEDURES

To minimize public exposure to potentially PCB-impacted soils during transportation of soil containers and after excavation activities, all equipment, trucks, soil containers, tools, etc. used during the remedial activities which came in contact with the PCB-impacted soils must be decontaminated prior to leaving the excavation area. The procedures follow the EPA Region II decontamination procedures listed in the Quality Assurance Manual.

Intermodal Containers and Trucks

Decontamination of the exterior of the intermodal containers and trucks used to move them will consist of removing all loose soil from exposed surfaces, including the tires, prior to leaving the fenced area surrounding the excavation site. This will require the use of a steam cleaner. Wash water will be recovered and containerized for proper disposal. Proper disposal involves several steps:

- The wash water will be collected in a sump of the decontamination area.
- This water will be passed through two filters for coarse solids and finer particles removal.
- The water will then be passed through granular activated charcoal filter canisters.
- This water will then be collected, sampled to meet Puerto Rico EQB water standards and then disposed of at a local POTW.

- The gross solids will be disposed with the excavated soils. The filter media will be collected for off-site incineration at an approved incinerator and the charcoal canisters will be returned to the distributor for reactivation.

Final decontamination of the intermodal containers will be the responsibility of USEcology after the soil has been disposed.

Excavation Equipment

Equipment used in excavating and loading PCB-impacted soil into the intermodal containers must be decontaminated prior to leaving the site area. Decontamination of this equipment will consist of removal of all loose soil and debris, followed by a thorough cleaning using a steam cleaner. All wash water must be recovered and containerized for proper disposal.

Sampling Equipment

Decontamination of soil sampling equipment and tools will consist of an initial wash and scrub with low phosphate detergent, followed by rinsing with potable water, a solvent rinse with pesticide-grade acetone, a thorough rinse with deionized, demonstrated analyte-free water, allowed to air dry and wrap with aluminum foil. The analyte-free water must be demonstrated, prior to start of sample collection, to be free of PCB contamination below the contract required quantitation limits for PCB Arochlor 1260. This standard for water is 1 mg/L. Personnel decontamination procedures will be detailed in the project-specific HSP.

Section 6
TRANSPORTATION AND DISPOSAL

This section describes the transportation, disposal, temporary storage, manifesting and permitting/notification requirements for the remedial action at Sites 15 and 16.

Disposal of Uncontaminated Vegetation and Site Debris

Vegetation will be cut down and removed and any extraneous site debris removed prior to excavation of the PCB-impacted soil. Because this vegetation will be cut rather than grubbed, the vegetation will be presumed to be uncontaminated and can be disposed in a local landfill thereby reducing the volume of contaminated media to be disposed in a TSCA-approved facility. However, to ensure this debris is not contaminated, a composite sample will be analyzed as described in Sections 3 and 4.

The uncontaminated vegetation and site debris will be loaded into trucks to be hauled for disposal at a local landfill located outside Naval Station Roosevelt Roads. The Fajardo Landfill has been identified as the nearest solid waste landfill and is located approximately 20 miles from Naval Station Roosevelt Roads.

Transportation of PCB-Impacted Soil to Beatty, Nevada

Transportation of PCB-contaminated soils from Naval Station Roosevelt Roads will be to USEcology's TSCA-Approved Disposal Facility in Beatty, Nevada. USEcology is experienced in managing overseas shipments of waste and is capable of managing transportation in its entirety from the Naval Station Roosevelt Roads to the disposal site. This includes the work described as follows:

- Empty intermodal containers will be delivered to the designated staging area at Naval Station Roosevelt Roads and weighed.

- Filled intermodal containers will be weighed and picked up and transported to the Port of San Juan where they will be weighed and loaded onto a commercial barge.

- The intermodal containers will enter the U.S. via the port of Lake Charles, Louisiana where they will be unloaded and weighed and transferred onto rail cars.

- The intermodal containers will travel by rail car to Las Vegas, Nevada where they will be unloaded and transferred to trucks.

- The intermodal containers will be hauled by truck from Las Vegas, Nevada approximately 100 miles to Beatty, Nevada by a licensed hazardous waste hauler. The containers will be weighed at the landfill.

A total of five weigh tickets will be generated for each container. It is USEcology's recommendation that all the material not be transported in a single barge trip due to the difficulty associated with moving containers to and from the barge, especially in Puerto Rico. Several shipments of 20-30 containers maximum per trip are recommended.

Disposal of PCB-Contaminated Soil

The PCB-contaminated soil is to be disposed at USEcology's Landfill in Beatty, Nevada. There are few requirements regarding the condition of materials to be disposed other than the absence of free liquids. If the material can be loaded into containers, it can be handled at the disposal facility.

Waste Profile. A waste profile form must be completed and submitted to USEcology's corporate office for review, approval and assignment of a waste stream number prior to commencement of the work. This will not require sending an additional soil sample for analysis--the profile form can be completed based on previous analyses of a representative soil sample. Full toxicity characteristic leaching procedure (TCLP) analyses have been

conducted on composite soil samples from each site and are included in Appendix E. Sample 15-20 is a composite sample from Site 15; sample 16-20 is a composite sample from Site 16. The results of these analyses will be used to prepare the waste profile form. These results indicate no TCLP constituents are present above any limits which would classify this material as a RCRA waste. Once the waste stream number has been assigned, the Beatty, Nevada facility must be contacted to schedule the waste shipment at least 48 hours prior to shipment.

TSCA Disposal Requirements. In accordance with *40 CFR 761.60(a)(4), Any non-liquid PCBs at concentrations of 50 ppm or greater in the form of contaminated soil, rags, or other debris shall be disposed of: (i) In an incinerator which complies with 40 CFR 761.70; or (ii) In a chemical waste landfill which complies with 40 CFR 761.75.* For non-liquid PCBs there is no upper limit on PCB concentration which would prohibit disposal in a chemical waste landfill.

Temporary Storage Requirements

Excavation of PCB-contaminated soils must be accomplished so that the soil is loaded directly into lined, intermodal containers. Once the soil is placed in the intermodal containers, it must not be stored on site more than thirty days. This will allow the PCB-contaminated soil to be managed without having to comply with the PCB storage requirements of 40 CFR 761.65(b) according to the exemption in 40 CFR 761.65(c)(1). However, other storage requirements under 40 CFR 761.65 must be followed, including: marking of the storage area in accordance with 40 CFR 761.40(a)(1)and(10); decontamination of movable equipment used for handling PCBs in accordance with 40 CFR 761.79; intermodal containers meeting the strength and durability requirements of 40 CFR 761.65(c)(6); and, containers must be marked with the date on which PCBs were placed in storage.

TSCA Recordkeeping and Manifest Requirements

The owner or operator of the PCB storage area must develop and maintain all annual records and a written annual document log of the disposition of PCBs in accordance with 40 CFR 761.80(a). The written annual document log must be prepared by July 1 covering the previous calendar year (January through December). The oversight contractor will be responsible for preparing the annual document log, assembling the annual records, and providing these documents to the Naval Station Roosevelt Roads Department of Public Works so that they may be maintained for the required three year period after completion of the work. The annual records shall include:

1) All signed manifests generated by the remedial operation during the calendar year.

2) All Certificates of Disposal received from the disposal facility during the calendar year.

The written annual document log must include:

1) Name, address and EPA Identification number of the facility

2) The unique manifest number of every manifest generated by the facility during the calendar year

3) For each container: the weight in kilograms, the date the soil was placed in the container, the date the container was placed into transport for disposal and the date of disposal if known

4) A record of each telephone call, or other means of verification agreed upon by both parties, made to each designated disposal facility to confirm receipt of PCB waste transported by an independent transporter as required by 40 CFR 761.208

The PCB remedial activities planned for Sites 15 and 16 at Naval Station Roosevelt Roads are exempt from having a unique EPA identification number under 40 CFR 761.207(c)(1).

The generic identification number "40 CFR Part 761" previously assigned to Naval Station Roosevelt Roads will be used on the manifests, records and reports. That number is PR2170027203.

A manifest must be prepared for each intermodal container using EPA Form 8700-22. 40 CFR 207 and 208 provide details for the use and completion of the manifest. Puerto Rico EQB will be provided copies of the manifests, Certificates of Disposal, and the annual document log.

U.S. Department of Agriculture (USDA) Permits

The selected disposal site for the PCB-contaminated soils originating at Naval Station Roosevelt Roads, Puerto Rico must have a USDA permit to receive soils that originate outside the U.S. mainland. This is required to comply with 7 CFR 330.300, Soil From Foreign Countries or Territories or Possessions and 7 CFR 330.60, Notice of Quarantine. These permits are issued for periods of five years.

According to verbal communications with USDA officials, USDA does not typically inspect shipments of contaminated soil entering the United States, but they reserve the right to do so. USDA personnel at the port of entry will review the documentation accompanying the shipment to be sure that the designated disposal facility has a USDA permit in place. The USDA performs yearly reviews of permitted facilities to ensure that the terms of the permit are being met.

The selected disposal facility does not currently have a USDA permit in place. However, USEcology has indicated that they have begun the process of obtaining a permit for their Beatty, Nevada landfill.

Environmental Quality Board (EQB), Puerto Rico

Rule II-906 of the Puerto Rico Solid Waste Regulations requires that owners and operators of non-hazardous solid waste generating activities obtain a permit from the Environmental Quality Board (EQB). Note that these rules do allow the Board to grant a temporary permit to operate a non-hazardous solid waste generating activity for a service or facility that is temporary in nature. This permit would be required for removing and disposing of the vegetation at the site. A second permit would be required for the excavation and removal of the PCB-contaminated soil. A hazardous waste permit is not required for the PCB-contaminated soil removal because PCBs are not hazardous wastes, but TSCA wastes.

Rule 402 of the Puerto Rico Solid Waste Regulations requires that the owner or operator of a non-hazardous solid waste generating activity submit a Non-Hazardous Solid Waste Operating Plan to the Board for approval. This would apply to the removal and disposal of the vegetation at the site and to the excavation, removal and transportation of the PCB-contaminated soils.

The Puerto Rico Environmental Impact Statement Regulations require that an Environmental Assessment (EA) be prepared for the activities planned at Sites 15 and 16 and submitted to the EQB. Based on the EA, the EQB will determine whether an Environmental Impact Statement (EIS) or a Determination of No Significant Environmental Impact (N-D) will be required. The EA must also include a Plan for the Control of Erosion and Sedimentation in accordance with Section 5.3.6.j. of the Puerto Rico EIS Regulations.

DOT Shipping Requirements

The intermodal containers must be transported in accordance with U.S. Department of Transportation shipping requirements found in Title 49 of the Code of Federal Regulations. These requirements include shipping container specifications and placarding requirements.

Section 7
SCHEDULE

The activities required to complete the remedial action at Sites 15 and 16 have been separately identified and developed into an overall project schedule. Durations and required activity precedence were defined and a critical path timeline developed. In addition, the subcontract entity responsible for each activity has been identified. The overall project schedule is provided on the following figure. Certain assumptions and requirements which are built into the project schedule are discussed below:

- It is assumed that the oversight contractor will have responsibility for subcontracting. It is anticipated that approximately 6 weeks will be required.
- It is assumed that the EQB permits will take 2 months for approval.
- It is assumed that construction/excavation permits from the Base will not take more than 4 weeks to obtain.
- A project-specific health and safety plan will be required. Review by the Navy will be provided within 1 week of submittal.
- Transport of intermodal containers to Naval Station Roosevelt Roads will take approximately 5 weeks. The laydown area must be completed prior to their arrival.
- Estimates of time required to complete each site activity have been increased by approximately 20 to 25 percent for weather delays.
- Clearing and disposal of plant material and site debris will take approximately 3 weeks.
- It is anticipated that excavated soil from each site will be containerized and held in the laydown area until the confirmation results have been received and are below the prescribed cutoff limit. However, soil shipment must begin within 30 days of excavation, resulting in the need to transport soil offsite in several shipments.
- Confirmation analyses will be performed by the laboratory.

- Excavation and receipt of acceptable confirmation analyses from the first site will be completed prior to starting excavation at the second site.
- Excavation work at each site is expected to take about 8 weeks.
- Soil shipped to Beatty, Nevada will be in transit approximately 5 to 6 weeks.
- The final soil shipment to Beatty, Nevada will be after receipt of all confirmation analyses.
- Return copies of soil manifests and disposal records will be provided by USEcology within 3 weeks of delivery of soil to their facility in Beatty, Nevada.

Based on the critical path timeline, the project schedule is approximately 40 weeks from Notice to Proceed until receipt of disposal records for the final soil shipment to the disposal facility. However, this schedule is sensitive to various delays including weather, permitting, document review, and availability of transportation facilities such as dock space, rail, and marine transport.

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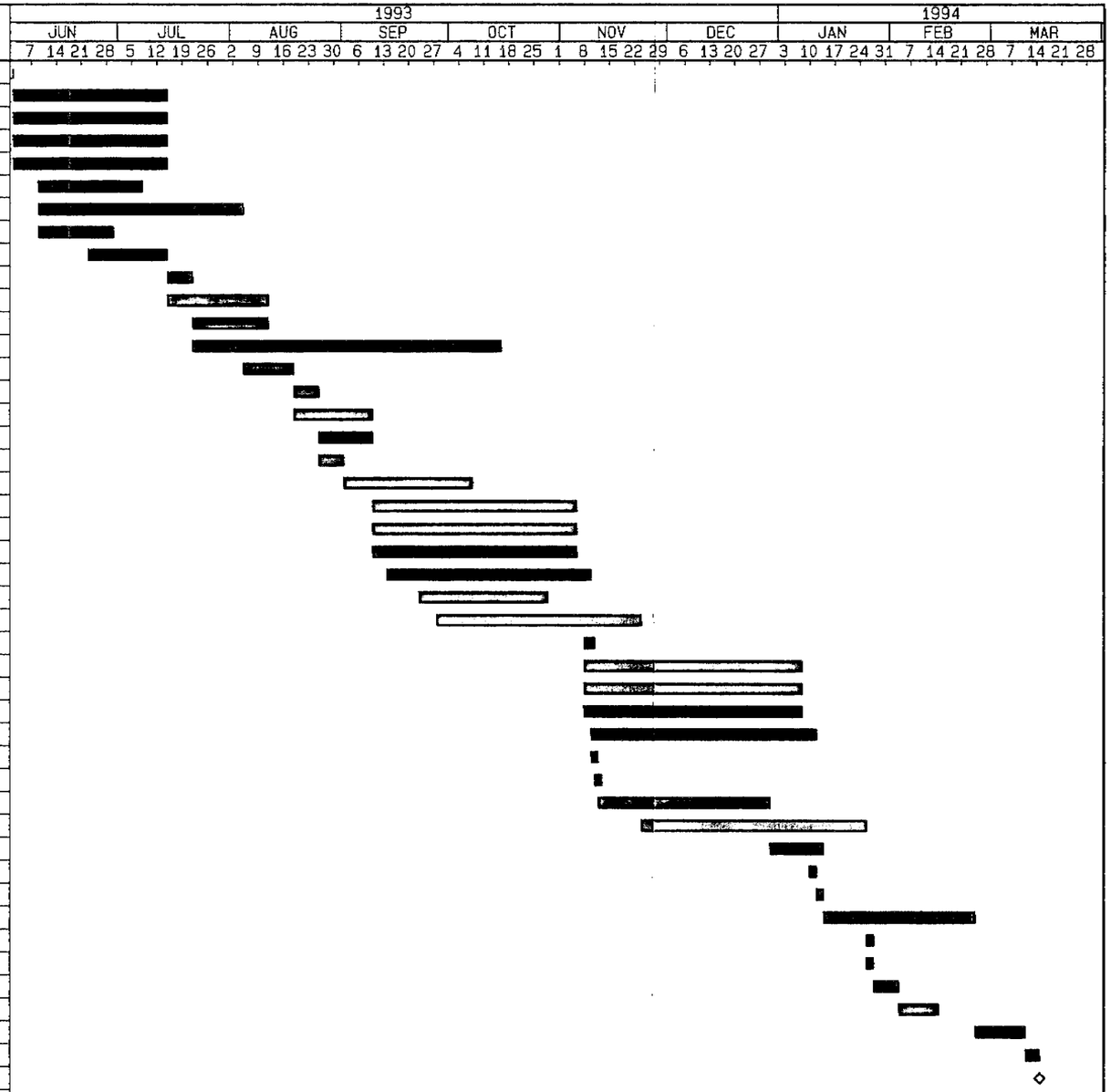
ACTIVITY ID	ACTIVITY DESCRIPTION	EARLY START	EARLY FINISH
10	NAVY ISSUE NTP TO OVERSIGHT CONTRACTOR	1JUN93	1JUN93
100	NEGOTIATE & ISSUE CONTRACT/EXCAVATION	2JUN93	14JUL93
110	NEGOTIATE & ISSUE CONTRACT/U.S.ECOLOGY	2JUN93	14JUL93
120	NEGOTIATE & ISSUE CONTRACT/HAULER	2JUN93	14JUL93
130	NEGOTIATE & ISSUE CONTRACT/BORROW MATERIAL	2JUN93	14JUL93
150	OBTAIN PERMITS/ROICC, PUBLIC WORKS DEPARTMENT	9JUN93	7JUL93
160	OBTAIN EQB PERMITS	9JUN93	4AUG93
170	PREPARE HEALTH & SAFETY PLAN	9JUN93	29JUN93
180	PREPARE QAPP PLAN	23JUN93	14JUL93
210	OVERSIGHT CONTRACTOR MOBILIZE	15JUL93	21JUL93
220	TRANSPORT CONTAINERS BY BARGE TO PUERTO RICO	15JUL93	11AUG93
270	TRANSPORT UNCONTAMINATED DEBRIS TO FAJARDO	22JUL93	11AUG93
300	CONSTRUCTION MANAGEMENT	22JUL93	15OCT93
200	EXCAVATION CONTRACTOR MOBILIZE	5AUG93	18AUG93
230	PREPARE LAYDOWN AREA FOR CONTAINERS	19AUG93	25AUG93
260	CLEAR SITES	19AUG93	9SEP93
240	TRANSPORT CONTAINERS TO LAYDOWN AREA	26AUG93	9SEP93
250	COMPLETE LAYDOWN AREA	26AUG93	1SEP93
500	SITE 15 SEDIMENT & EROSION CONTROL	2SEP93	7OCT93
510	SITE 15 EXCAVATE & LOAD CONTAINERS	10SEP93	5NOV93
520	MOVE SITE 15 CONTAINERS TO LAYDOWN AREA	10SEP93	5NOV93
530	SITE 15 SCREENING	10SEP93	5NOV93
540	SITE 15 CONFIRMATION ANALYSIS	14SEP93	9NOV93
600	SITE 16 SEDIMENT & EROSION CONTROL	23SEP93	28OCT93
560	SITE 15 BACKFILL	28SEP93	23NOV93
550	SITE 15 EQUIPMENT DECONTAMINATION	8NOV93	10NOV93
610	SITE 16 EXCAVATE & LOAD CONTAINERS	8NOV93	7JAN94
620	MOVE SITE 16 CONTAINERS TO LAYDOWN AREA	8NOV93	7JAN94
630	SITE 16 SCREENINC	8NOV93	7JAN94
640	SITE 16 CONFIRMATION ANALYSIS	10NOV93	11JAN94
700	SITE 15 MANIFEST PREPARATION	10NOV93	11NOV93
570	RESEED SITE 15	11NOV93	12NOV93
720	SITE 15 TRANSPORT & DISPOSE OF CONTAMINATED SOIL	12NOV93	29DEC93
660	SITE 16 BACKFILL	24NOV93	25JAN94
740	SITE 15 RECEIVE & FILE TRANSPORT DISPOSAL DOCS.	30DEC93	13JAN94
650	SITE 16 EQUIPMENT DECONTAMINATION	10JAN94	11JAN94
710	SITE 16 MANIFEST PREPARATION	12JAN94	13JAN94
730	SITE 16 TRANSPORT & DISPOSE OF CONTAMINATED SOIL	14JAN94	24FEB94
670	SITE 16 INSTALL NEW DRIVEWAY	26JAN94	27JAN94
680	SITE 16 RESEED	26JAN94	27JAN94
760	FINAL INSPECTION & PUNCHLIST	28JAN94	3FEB94
770	EXCAVATION CONTRACTOR DEMOBILIZE	4FEB94	14FEB94
750	SITE 16 RECEIVE & FILE TRANSPORT DISPOSAL DOCS.	25FEB94	10MAR94
780	OVERSIGHT CONTRACTOR DEMOBILIZE	11MAR94	14MAR94
800	PROJECT COMPLETE	15MAR94	14MAR94



Plot Date 8MAR93
Data Date 1JUN93
Project Start 1JUN93
Project Finish 14MAR94

Activity Bar/Early Dates
Critical Activity
Progress Bar
Milestone/Flag Activity

NAVAL STATION ROOSEVELT ROADS P.R.
PCB REMEDIAL ACTION SITES 15 & 16
PROJECT CONSTRUCTION SCHEDULE

Sheet 1 of 1

RESPONSIBILITY
EXCAVATION CONTRACTOR
LABORATORY
LOCAL HAULER
LOCAL HAULER & EXCAVATION CONTRACTOR
OVERSIGHT CONTRACTOR
U S ECOLOGY

METCALF & EDDY

Date	Revision	Checked	Approved

Section 8

QUALITY ASSURANCE/QUALITY CONTROL

Quality Assurance/Quality Control (QA/QC) measures for this project will focus on two types of activities, those which generate analytical data and those related to the construction aspects of the project. Each contractor performing tasks which require QA/QC measures will generate a Quality Assurance Project Plan (QAPP) which is specific to that contractor's activities. The Oversight Contractor will then coordinate and assemble an overall project QAPP which incorporates the other contractors' plans. This Project QAPP will be submitted to the Navy for approval prior to initiation of field activities.

Analytical Data QA/QC

During the remedial actions at Sites 15 and 16, analytical data will be developed from several types of activities. These activities include field screening of soil during excavation, and confirmation analyses to verify the effectiveness of the remedial action. Analytical QA/QC measures are to ensure that analytical data satisfy the data quality characteristics of: accuracy, precision, comparability, representativeness, and completeness.

Accuracy is defined as the degree of agreement of a measurement (or measurement average) with an accepted reference or true value. For field screening data, accuracy will be determined by analyzing prepared standards. Standards will be analyzed during the daily calibration procedure for the Dexsil analyzer, and at a minimum frequency of one per every 10 samples analyzed for the remainder of the day.

For confirmation samples, accuracy will be determined in the laboratory through the use of matrix and surrogate spikes. The acceptable spike recovery limits for the analytical methods used will be specified in the laboratory QAPP.

Precision is a measure of agreement among individual measurements of the same property under similar conditions. For field screening data, precision will be determined by analyzing duplicate field samples. These duplicates will be prepared by conducting separate extractions on soil collected from one sample location per sample area. Precision will be determined in confirmation samples by analyzing sample duplicates and matrix spike duplicates. The type and frequency of duplicate samples must be specified in the laboratory QAPP. As an independent precision check duplicate composite samples one time or daily will be submitted to the laboratory as a blind duplicate.

Comparability expresses the confidence with which one data set can be compared to another. To achieve comparability in field screening data, all extractions and analyses will follow the procedures outlined in the Dexsil analyzer kit. Samples collected for field screening will be handled and prepared in an identical manner. Laboratory analytical data will be reported in consistent units, as required by the EPA test methods used.

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of a data population, a sampling point, or an environment. For the field screening activities, grab samples shall be taken, and such samples are, by definition, representative of only the conditions at the point in time collected. However, sample collection locations will be established to obtain as representative a sample of the site conditions as possible. For confirmation analyses, split samples of all field screening locations which establish an excavation limit within a given area will be obtained. Use of duplicate samples and analyses will verify the reproducibility of a data set, thereby establishing the representativeness of the sample set.

Completeness is a measure of the amount of valid data obtained compared to the amount expected to be collected under normal conditions. For the data to be valid, it must meet all the acceptance criteria including accuracy, precision, and any other requirement specified by the analytical method used. EPA-approved data validation procedures will be employed by the Subcontractor to assure the quality of the data reported.

Sample Collection Procedures

In order to maintain QA/QC during sample collection, sample collection procedures are established. These procedures are based on EPA protocols described earlier. Sample collection procedures for both screening and confirmation analyses are described in the Field Sampling Plan section of this Work Plan. A detailed Quality Assurance Program Plan will be prepared by the Subcontractor prior to the commencement of field activities.

QA/QC During Construction Activities

Construction quality assurance involves the use of scientific and engineering principles and practices to ensure that all design criteria, plans, and specifications are met during the remedial action. Quality Control is a planned system of inspections and tests performed to monitor and control the quality of the construction activities. A Construction Quality Assurance Project Plan (CQAPP) will be prepared by the excavation contractor to document what types of inspections, tests, audits, and evaluations will be performed to assure that the work performed is in accordance with the project drawings and specifications. This CQAPP will be incorporated in the overall project QAPP.

APPENDIX A

COMPARISON OF SOIL VALUES OF AROCHLOR 1260 USING A DEXSIL L2000 PCB/ CHLORINE ANALYZER AND SW846 METHOD 8080

COMPARISON OF SOIL VALUES OF AROCLOR 1260 USING A DEXSIL L2000 PCB/CHLORIDE ANALYZER AND SW846 METHOD 8080

CONTRACT N47408-92-D-3042 (POLM) DELIVERY ORDER NO. 010

SITES 15 AND 16 NAVAL STATION ROOSEVELT ROADS

PUERTO RICO

Prepared by:

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Robert W. Hastings, P.G.
(Project Manager)

Approved by:

Barry B. Van Wagner, P.E.
(OHM Program Manager)

Date

COMPARISON OF SOIL VALUES OF AROCLOR 1260 USING A DEXSIL L2000 PCB/CHLORIDE ANALYZER AND SW 846 METHOD 8080

SITES 15 AND 16 NAVAL STATION ROOSEVELT ROADS PUERTO RICO

This report documents field and analytical activities conducted to establish if a rapid field determination of the concentration of Aroclor 1260, a polychlorinated biphenyl (PCB), can be accomplished using a Dexsil L2000 PCB/chloride analyzer at Sites 15 and 16, Naval Station Roosevelt Roads, Puerto Rico. This evaluation has been conducted to assess the usefulness of the Dexsil field screening method as a way to establish the limits of soil removal during remedial actions at Sites 15 and 16. To evaluate the effectiveness of the field screening method, soil samples from areas known to be impacted by Aroclor 1260 were collected, split, and analyzed by both the Dexsil L2000 PCB/chloride analyzer in the field and by an analytical laboratory.

In addition, soil samples from each site were collected from areas outside of the impacted zones and analyzed to establish any baseline response levels using the Dexsil method. The following sections describe the sample collection, field screening results, and laboratory analytical results; provide a comparison of the field and laboratory results; and discuss the useability of the field screening method to establish excavation limits during remedial actions at these sites.

Sample Collection: Soil samples were collected from a total of 15 locations at Sites 15 and 16. At Site 15, five soil samples were collected from areas within previously defined impacted zones and one soil sample was collected in an area where soil impacts were not suspected. At Site 16, eight soil samples were collected from known impacted areas and one sample was collected from an area where impacts were not suspected. Samples from surficial and near surface (less than 6 inches below grade) soils were collected using pre-cleaned stainless steel spoons. Soil samples were placed in aluminum pans and thoroughly composited using a quartering and mix method. A portion of the composited soil sample was then placed in an 8 ounce jar and stored in an ice chest, with ice, until a determination was made of which samples would be sent to the laboratory for confirmation analysis. An additional portion of each sample collected and composited was set aside for analysis using

the Dexsil L2000 PCB/chloride analyzer. The remaining sample volume was then composited by site for waste profiling and toxic characteristics leaching procedure (TCLP) analyses. These analyses were conducted for evaluation of disposal options for the remedial actions planned for Sites 15 and 16. The results of the waste profile and TCLP analyses are not included with this report.

Field Screening Results: Field screening of soil samples from Sites 15 and 16 was performed using the Dexsil L2000 PCB/chloride analyzer. Soil samples were prepared for analysis following the manufacturer's requirements. The soil samples were subjected to an extraction process which converts any PCBs to chloride. The Dexsil analyzer has a chloride-specific electrode which then measures the chloride content of the extract. To evaluate the concentration of PCBs in the soil sample, the Dexsil L2000 was set in the Aroclor 1260 mode. The Aroclor 1260 mode was selected based on the analytical results from the previous RI/FS activities at the sites, which indicated that Aroclor 1260 was the PCB type present. Fifteen soil samples were analyzed using the Dexsil analyzer. One sample at each site was collected from areas which were not suspected of being impacted by PCBs. These samples were analyzed to establish a baseline response level (or background value) for each site. This was necessary because the Dexsil analyzer responds to the total chloride content of a sample and these sites are located on soil deposits of marine origin which may have a considerable natural chloride content. The remaining soil samples were from known impacted areas containing varying concentrations of PCBs.

Concentrations of Aroclor 1260, as determined using the Dexsil analyzer, ranged from 1.8 to 174 parts per million (ppm). The background samples were in the lower range of values reported (<3 ppm).

Based on the results of the Dexsil analyzer, and the locations of these samples with respect to "known" concentrations of Aroclor 1260, eight samples were selected for analysis by an analytical laboratory. Of these samples, two were background samples (one from each site) and one was a duplicate sample of one of the background samples. The duplicate sample was submitted to establish the quality of the laboratory analytical results. The other five samples

were selected to evaluate whether the Dexsil analyzer could identify an actual soil concentration of 10 ppm, which will be the cutoff limit for soil removal during the planned remedial actions.

Laboratory Analytical Results: The eight samples selected for laboratory analysis were submitted to Analytical Services Corp. in Findlay, Ohio, via overnight Federal Express delivery. These samples were analyzed for PCBs using SW-846 Method 8080. Based on the analytical results, Aroclor 1260 was the only PCB detected in any of the samples. Laboratory concentrations of Aroclor 1260 ranged from below detection limits (<0.279 mg/kg) to 543 mg/kg. Laboratory values are reported in milligrams per kilogram (mg/kg) which is effectively equivalent to ppm. One of the background samples had no PCBs detected. The other background sample, for which a duplicate sample was also submitted, had concentrations of 3.77 and 2.72 mg/kg reported. The analytical data summary package provided by the laboratory is included as Attachment A.

Comparison of Results: To determine the useability of the Dexsil analyzer to detect soil concentrations of Aroclor 1260, especially near the 10 ppm target excavation cut off limit, the laboratory values were compared to the field screening values determined by the Dexsil analyzer. The following table presents both the field screening results and the laboratory values of Aroclor 1260 for the eight samples submitted for analysis.

Sample ID	Dexsil Results (ppm)	Laboratory Results (mg/kg)
15-01	5.4	30.9
15-03	62	62.4
15-05 (background)	2.6	<0.279
15-06	174	543
16-06	7.0	53.3
16-07	5.3	21.3
16-09 (background)	2.1	3.77
16-09B (duplicate)	2.1	2.72

Figure 1 shows a graphic comparison of the field screening and laboratory results. In general, there is a correlation between high and low field screening and high and low laboratory values. **Figure 2** shows a direct comparison of the field screening and laboratory values. Although the relationship between the values is not linear, there is enough agreement between values to use the field screening method as an expeditious way of establishing soil excavation cutoff limits, subject to some confirmatory laboratory analysis.

The soils at Sites 15 and 16 do contain enough naturally occurring chloride to affect a response using the Dexsil analyzer. Therefore, a baseline response level must be determined prior to using the field screening method. According to the data from this evaluation, samples with actual soil concentrations of Aroclor 1260 greater than 10 mg/kg all showed a Dexsil analyzer value greater than 3 ppm. To be conservative, any response value from the Dexsil analyzer above the average baseline response, which should be established each day soil removal is occurring, will indicate soils which may contain PCBs in excess of the 10 ppm cutoff limit. This approach should ensure that all soil with PCBs in excess of the cutoff limit will be removed. However, removal of some soil with PCBs below 10 ppm level may occur as a result of using the Dexsil analyzer to establish removal areas.

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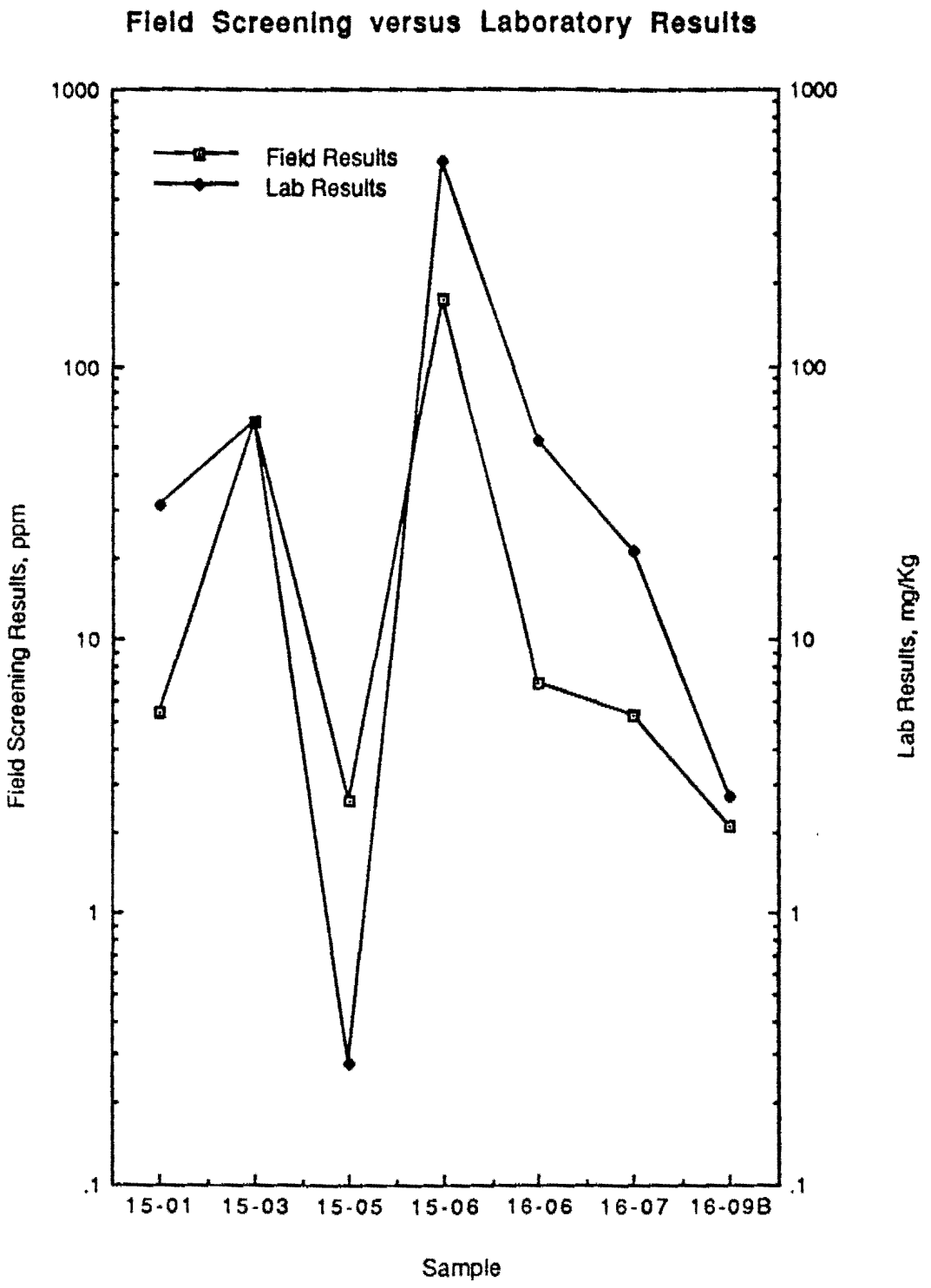

Field Screening versus Laboratory Results
Field Results
Lab Results
1000
100
10
1
.1
Field Screening Results, ppm
Lab Results, mg/Kg
15-01
15-03
15-05
15-06
16-06
16-07
16-09B
Sample

FIGURE 1

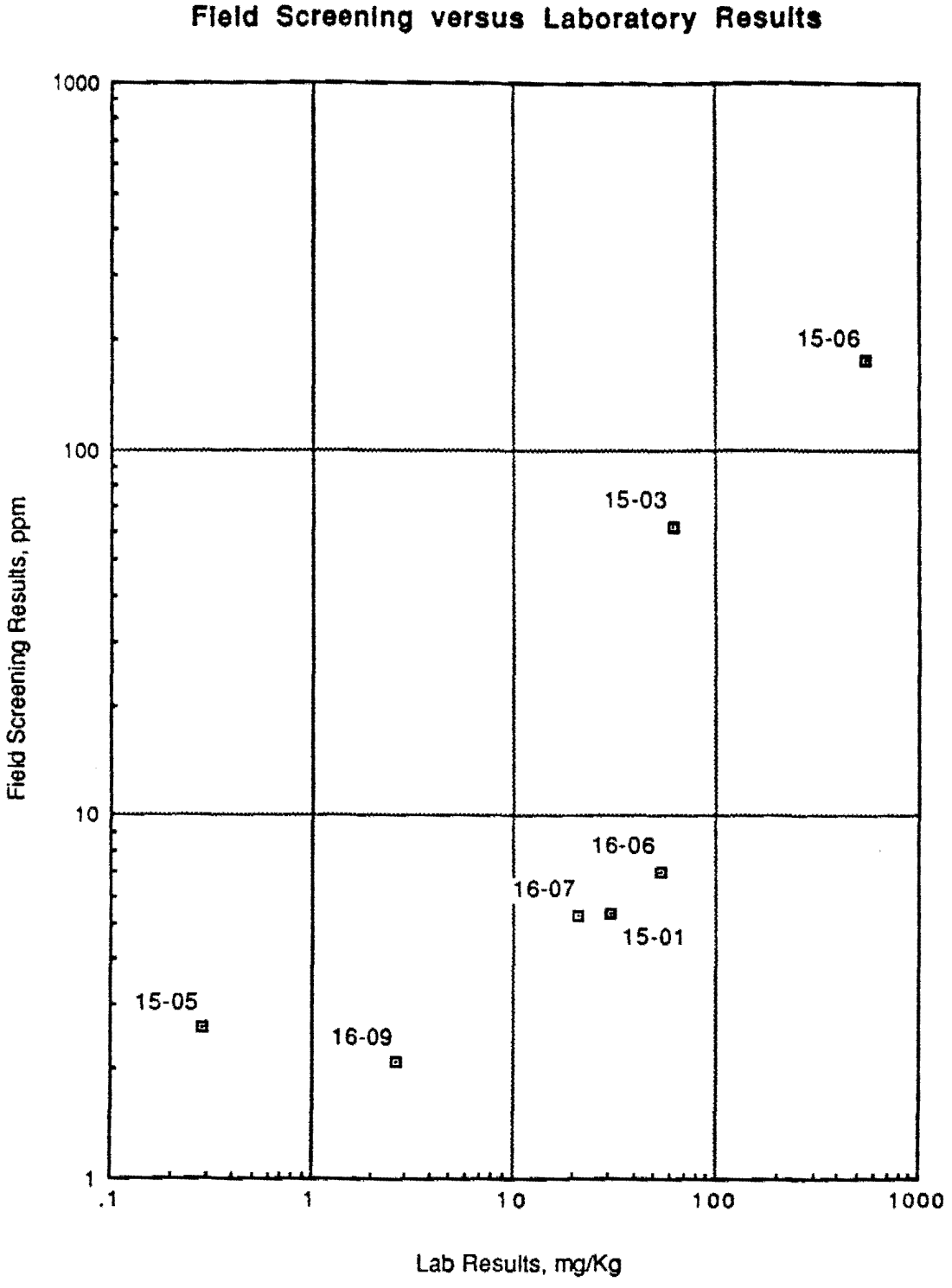

Field Screening versus Laboratory Results
Field Screening Results, ppm
1000
100
10
1
.1
1
10
100
1000
Lab Results, mg/Kg
15-06
15-03
16-06
16-07
15-01
15-05
16-09

FIGURE 2

ATTACHMENT A

LABORATORY ANALYTICAL REPORT

Analytical Services Corp.

ANALYTICAL REPORT

CLIENT: Metcalf & Eddy, Inc.

ATTN: R. Hastings

PROJECT: 300519

SAMPLE TYPE(s): Solids

ANALYSIS PERFORMED: Organics and TCLP\RCRA Parameters

DATE RECEIVED: October 30, 1992

JOBLINK(s): #610897

Reviewed and Approved by: Joseph A Hnatow for *Thomas E. Gran, Ph.D., Vice President* *Date:* 11-13-92

16406 U.S. Route 224 East ■ P.O. Box 1404 ■ Findlay, Ohio 45839-1404 ■ 419-423-3526

DATA SUMMARY REPORT

DATE: 11/13/92

PAGE: 1

Company: METCALF & EDDY, INC.

	Sample Point ID:	15-01	15-03	15-05	15-06	16-06	16-07	16-09	16-09B
	ASC Sample Number:	JJ3565	JJ3566	JJ3567	JJ3568	JJ3569	JJ3570	JJ3571	JJ3572
	Sample Date:	921028	921028	921028	921028	921028	921028	921028	921028
	Facility Code:	300519	300519	300519	300519	300519	300519	300519	300519
Parameters	Units								
Priority Pollutant PCB Analysis, GC, (GS13)									
Aroclor 1016	mg/kg	<3.45	<28.1	<.279	<344	<13.3	<13.7	<.271	<.306
Aroclor 1221	mg/kg	<3.45	<28.1	<.279	<344	<13.3	<13.7	<.271	<.306
Aroclor 1232	mg/kg	<3.45	<28.1	<.279	<344	<13.3	<13.7	<.271	<.306
Aroclor 1242	mg/kg	<3.45	<28.1	<.279	<344	<13.3	<13.7	<.271	<.306
Aroclor 1248	mg/kg	<3.45	<28.1	<.279	<344	<13.3	<13.7	<.271	<.306
Aroclor 1254	mg/kg	<3.45	<28.1	<.279	<344	<13.3	<13.7	<.271	<.306
Aroclor 1260	mg/kg	30.9	62.4	<.279	543	53.3	21.3	3.77	2.72

PRIORITY POLLUTANT PCB ANALYSIS, GC, (GS13)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	15-01	JJ3565

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Aroclor 1016	ND	3.45	ND	Q2P6293
Aroclor 1221	ND	3.45	ND	Q2P6293
Aroclor 1232	ND	3.45	ND	Q2P6293
Aroclor 1242	ND	3.45	ND	Q2P6293
Aroclor 1248	ND	3.45	ND	Q2P6293
Aroclor 1254	ND	3.45	ND	Q2P6293
Aroclor 1260	30.9	3.45	ND	Q2P6293

PRIORITY POLLUTANT PCB ANALYSIS, GC, (GS13)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	15-03	JJ3566

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Aroclor 1016	ND	28.1	ND	Q2P6293
Aroclor 1221	ND	28.1	ND	Q2P6293
Aroclor 1232	ND	28.1	ND	Q2P6293
Aroclor 1242	ND	28.1	ND	Q2P6293
Aroclor 1248	ND	28.1	ND	Q2P6293
Aroclor 1254	ND	28.1	ND	Q2P6293
Aroclor 1260	62.4	28.1	ND	Q2P6293

PRIORITY POLLUTANT PCB ANALYSIS, GC, (GS13)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	15-05	JJ3567

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Aroclor 1016	ND	.279	ND	Q2P6293
Aroclor 1221	ND	.279	ND	Q2P6293
Aroclor 1232	ND	.279	ND	Q2P6293
Aroclor 1242	ND	.279	ND	Q2P6293
Aroclor 1248	ND	.279	ND	Q2P6293
Aroclor 1254	ND	.279	ND	Q2P6293
Aroclor 1260	ND	.279	ND	Q2P6293

PRIORITY POLLUTANT PCB ANALYSIS, GC, (GS13)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	15-06	JJ3568

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Aroclor 1016	ND	344	ND	Q2P6293
Aroclor 1221	ND	344	ND	Q2P6293
Aroclor 1232	ND	344	ND	Q2P6293
Aroclor 1242	ND	344	ND	Q2P6293
Aroclor 1248	ND	344	ND	Q2P6293
Aroclor 1254	ND	344	ND	Q2P6293
Aroclor 1260	543	344	ND	Q2P6293

PRIORITY POLLUTANT PCB ANALYSIS, GC, (GS13)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	16-06	JJ3569

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Aroclor 1016	ND	13.3	ND	Q2P6293
Aroclor 1221	ND	13.3	ND	Q2P6293
Aroclor 1232	ND	13.3	ND	Q2P6293
Aroclor 1242	ND	13.3	ND	Q2P6293
Aroclor 1248	ND	13.3	ND	Q2P6293
Aroclor 1254	ND	13.3	ND	Q2P6293
Aroclor 1260	53.3	13.3	ND	Q2P6293

PRIORITY POLLUTANT PCB ANALYSIS, GC, (GS13)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	16-07	JJ3570

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Aroclor 1016	ND	13.7	ND	Q2P6293
Aroclor 1221	ND	13.7	ND	Q2P6293
Aroclor 1232	ND	13.7	ND	Q2P6293
Aroclor 1242	ND	13.7	ND	Q2P6293
Aroclor 1248	ND	13.7	ND	Q2P6293
Aroclor 1254	ND	13.7	ND	Q2P6293
Aroclor 1260	21.3	13.7	ND	Q2P6293

PRIORITY POLLUTANT PCB ANALYSIS, GC, (GS13)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	16-09	JJ3571

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Aroclor 1016	ND	.271	ND	Q2P6293
Aroclor 1221	ND	.271	ND	Q2P6293
Aroclor 1232	ND	.271	ND	Q2P6293
Aroclor 1242	ND	.271	ND	Q2P6293
Aroclor 1248	ND	.271	ND	Q2P6293
Aroclor 1254	ND	.271	ND	Q2P6293
Aroclor 1260	3.77	.271	ND	Q2P6293

PRIORITY POLLUTANT PCB ANALYSIS, GC, (GS13)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	16-09B	JJ3572

Compounds	Sample Results mg/kg	Detection Limits mg/kg	Blank Results mg/kg	Batch Number
Aroclor 1016	ND	.306	ND	Q2P6293
Aroclor 1221	ND	.306	ND	Q2P6293
Aroclor 1232	ND	.306	ND	Q2P6293
Aroclor 1242	ND	.306	ND	Q2P6293
Aroclor 1248	ND	.306	ND	Q2P6293
Aroclor 1254	ND	.306	ND	Q2P6293
Aroclor 1260	2.72	.306	ND	Q2P6293

PRIORITY POLLUTANT PCB ANALYSIS, GC, (GS13)

Compounds	Blank Results mg/kg	Blank Spike Recov	Unspiked Sample Results mg/kg	Matrix Spike Recov	Relative Percent Diff	Batch Number
Aroclor 1260	ND	106	-	-	-	Q2P6293

- Matrix spike recoveries are not available due to the dilution of the QC matrix spike sample extracts during analysis.

OHM Corporation

CHAIN-OF-CUSTODY RECORD

Form 0019
Field Technical Services
Rev. 08/89

Nº 112391

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME	PROJECT LOCATION
Nav Sta RR Sites 15 & 16	Roosevelt Roads, Puerto Rico

PROJ. NO	PROJECT CONTACT	PROJECT TELEPHONE NO
010661	R. Hastings	404 881-8010

CLIENT'S REPRESENTATIVE	PROJECT MANAGER/SUPERVISOR
J. Seykman	R. Hastings

ITEM NO	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS) PCB 8080 / TCLP (Full)	REMARKS
1	15-01	10-28	0925		✓	Soil Sample 15-01	1-8oz	X	
2	15-03	10-28	0955		✓	Soil Sample 15-03	1-8oz	X	
3	15-05	10-28	1020		✓	Soil Sample 15-05	1-8oz	X	
4	15-06	10-28	1035		✓	Soil Sample 15-06	1-8oz	X	
5	16-06	10-28	1600		✓	Soil Sample 16-06	1-8oz	X	
6	16-07	10-28	1610		✓	Soil Sample 16-07	1-8oz	X	
7	16-09	10-28	1630		✓	Soil Sample 16-09	1-8oz	X	
8	16-09B	10-28	1630		✓	Soil Sample 16-09	1-8oz	X	
9	15-20	10-28	1700	✓		Soil Composite Site 15	1-Qt	X	
10	16-20	10-28	1700	✓		Soil Composite Site 16	1-Qt	X	

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1	[signature]	Federal Express #		400
2	1-10	Fedex	[signature]	10-30-93	1108
3					
4					

REMARKS

8927-1812

Temp 10°C

SAMPLER'S SIGNATURE

LAB COPY

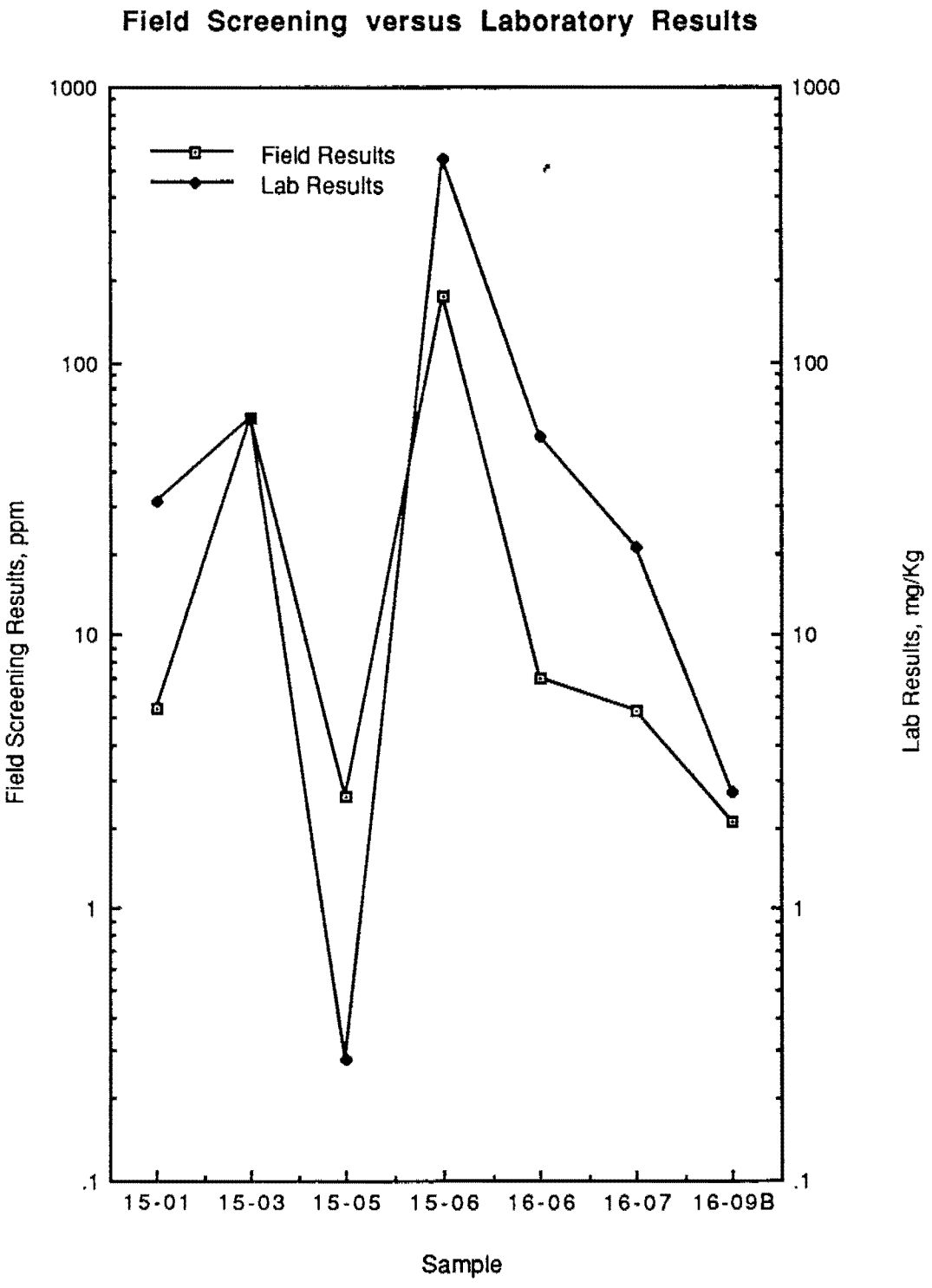

Field Screening versus Laboratory Results
Field Results
Lab Results
1000
100
10
1
.1
Field Screening Results, ppm
Lab Results, mg/Kg
15-01
15-03
15-05
15-06
16-06
16-07
16-09B
Sample

FIGURE 1

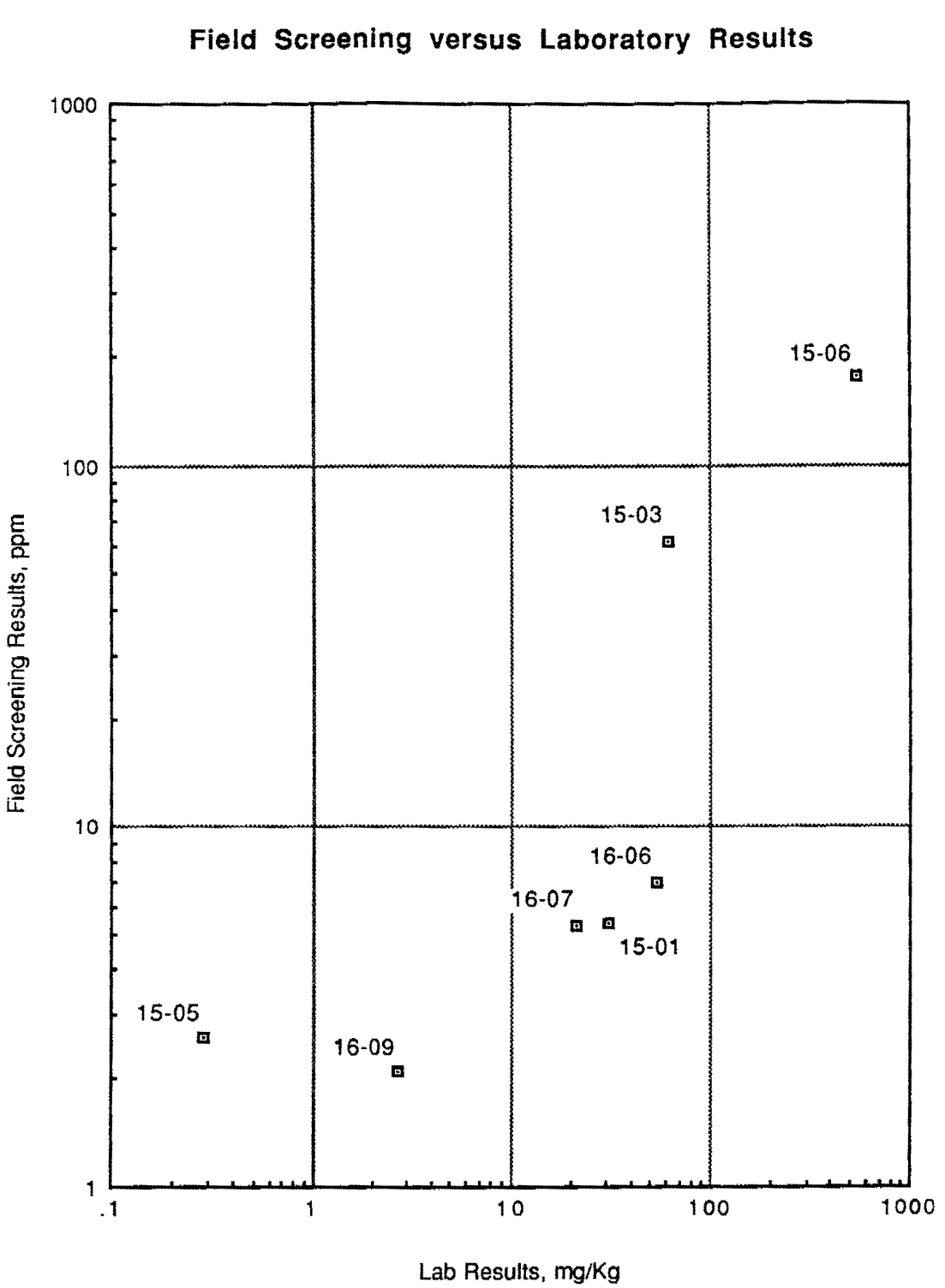

Field Screening versus Laboratory Results
1000
100
10
1
Field Screening Results, ppm
15-06
15-03
16-06
16-07
15-01
15-05
16-09
.1
1
10
100
1000
Lab Results, mg/Kg

FIGURE 2

APPENDIX B

SOIL TRANSPORT AND DISPOSAL COST EVALUATION

Transportation and Disposal Costs for N.S. Roosevelt Roads PCB–Contaminated Soil

Comparative Summary of Costs by Option

	Option One	Option Two	Option Three	Option Four
Transportation Costs	$763,000	$748,300	$793,000	$520,100
Disposal Costs	$270,000	$243,000	$632,000	$2,400,000
Additional Costs	$33,200 *	$96,200	$96,200	$96,200
	$1,066,200	$1,087,500	$1,521,200	$3,016,300

*Vegetation removal only, transportation of intermodal containers between Port of San Juan and N.S. Roosevelt Roads included in transportation cost.

Transportation and Disposal Costs for N.S. Roosevelt Roads PCB–Contaminated Soil

Option One: Transport and dispose at USEcology landfill in Beatty, NV

Transportation cost:	Unit	No. of Units	Cost
Port of San Juan to Beatty, NV	$6,900.00 per load*	100	$690,000.00
Liners	$40.00 each	100	$4,000.00
Monthly Container Rental	$690.00 per container	100	$69,000.00
Total Transportation Cost			$763,000.00
Disposal cost:			
Tipping fee	$75.35 per ton	2000	$150,700.00
Taxes	$59.65 per ton	2000	$119,300.00
Total disposal cost			$270,000.00
Total Transportation and Disposal Cost			$960,000.00

* Transportation price per container assumes a 22–ton maximum per container, with average of 20–tons per load and one month's rental for containers. Empty containers will be delivered to, and full containers picked up at N.S. Roosevelt Roads by a licensed hazardous waste hauler and drayed to Port of San Juan. The containers will be loaded onto a barge and shipped to Lake Charles, LA. The containers will be unloaded and transported from Lake Charles to Las Vegas, NV by railroad then to Beatty, NV by licensed hazardous waste hauler(100 mi.).

Advantages:
Experienced in overseas transport
Dedicated TSCA landfill
Lowest overall cost

Disadvantages:
100 miles trucking on public right–of–way
No USDA permit currently in place, application process begun

Transportation and Disposal Costs for N.S. Roosevelt Roads PCB–Contaminated Soil

Option Two: Transport and dispose at USPCI landfill in Grayback Mtn., UT

Transportation cost:	Unit	No. of Units	Cost
Port of San Juan to Houston, TX	$4,351.00 per load*	100	$435,100.00
Houston to Grayback Mtn., UT	$2,282.00 per load**	100	$228,200.00
Monthly container rental	$425.00 per container***	100	$85,000.00
Total transportation cost			$748,300.00
Disposal cost:			
Tipping fee	$120.00 per ton	2000	$240,000.00
Taxes	$1.50 per ton	2000	$3,000.00
Total disposal cost			$243,000.00
Total Transportation and Disposal Cost			$991,300.00

*Transportation per load includes cost of delivering up to 110 USPCI–owned intermodal containers with tarps and liners to the port of San Juan, PR.
**Transfer of containers to rail, management and transportation by rail to USPCI's Grayback Mountain, UT facility. Based on a minimum of 16 tons and maximum of 22 tons per container.
***Assume 100 containers for two months rental.

Advantages:
Existing USDA permit
No trucking over public right–of–way
Dedicated TSCA landfill

Disadvantages:
No experience in overseas transport

Transportation and Disposal Costs for N.S. Roosevelt Roads PCB–Contaminated Soil

Option Three: Transport and dispose at CWM landfill in Emelle, AL

Transportation cost:		Unit	No. of Units	Cost
Port of San Juan to Jacksonville, FL	$275,000.00	lump sum*		$275,000.00
Deliver containers to Jacksonville	$1,950.00	per container	100	$195,000.00
Jacksonville to Emelle, AL	$2,340.00	per container	100	$234,000.00
Monthly container rental	$425.00	per container**	100	$85,000.00
Liner	$40.00	each	100	$4,000.00
Total transportation cost				$793,000.00
Disposal cost:				
Tipping fee	$265.00	per ton	2000	$530,000.00
Taxes	$51.00	per ton	2000	$102,000.00
Total disposal cost				$632,000.00
Total Transportation and Disposal Cost				$1,425,000.00

* Cost to charter barge as provided by Crowley Marine Services
**Assume 100 containers for two months rental
Costs not included in this estimate are to transport empty containers from Jacksonville to Port of San Juan.

Advantages: None identified

Disadvantages:
Highest landfilling cost (RCRA landfill)
Longest trucking leg--from Jacksonville, FL to Emelle, AL
Cannot deliver containers to San Juan or contract for overseas transport
No USDA permit in place

Transportation and Disposal Costs for N.S. Roosevelt Roads PCB–Contaminated Soil

Option Four: Transport and dispose at CWM incinerator at Port Arthur, TX

Transportation cost:	Unit	No. of Units	Cost
Port of San Juan to Houston, TX	$4,351.00 per load*	100	$435,100.00
Monthly container rental	$425.00 per container**	200	$85,000.00
Total transportation cost			$520,100.00
Disposal cost:			
Incineration fee	$1,200.00 per ton***	2000	$2,400,000.00
Total disposal cost			$2,400,000.00
Total Transportation and Disposal Cost			$2,920,100.00

*Based on price provided by USPCI
**Assume 100 containers for two months rental
***Incineration fee is based on assumption that waste <2000 BTU/lb, for <3000 BTU/lb incineration fee would be $1400 per ton

Advantages:
Permanent destruction of PCBs, limited long–term liability
No land transport
Existing USDA permit

Disadvantages:
Highest cost for disposal
Overseas transport must be contracted separately

Transportation and Disposal Costs for N.S. Roosevelt Roads PCB–Contaminated Soil

Additional Costs: to be applied to all options except Option One

	Units	No. of Units	Cost
Transportation of Intermodal Containers from Port of San Juan to N.S. Roosevelt Roads			
by Juan Hernandez Company	$285.00 per trailer	100	$28,500.00
waiting fee	$30.00 per hour*	100	$3,000.00
Total Cost			$31,500.00
Transportation of Intermodal Containers from N.S. Roosevelt Roads to Port of San Juan			
by Juan Hernandez Company	$285.00 per trailer	100	$28,500.00
waiting fee	$30.00 per hour*	100	$3,000.00
Total Cost			$31,500.00
Transportation and disposal of uncontaminated vegetation to Fajardo Landfill: all options**			
truck	$380.00 per day	40	$15,200.00
driver	$15.00 per hour	400	$6,000.00
tipping fee	$150.00 per 10–cy load	80	$12,000.00
Total Cost			$33,200.00
Total			$96,200.00

* for each hour beyond two hours
**The Fajardo Landfill is approximately 20–30 miles from N.S. Roosevelt Roads. Estimate assumes approximately 800 cy of uncontaminated vegetation to be removed prior to excavation.

APPENDIX C

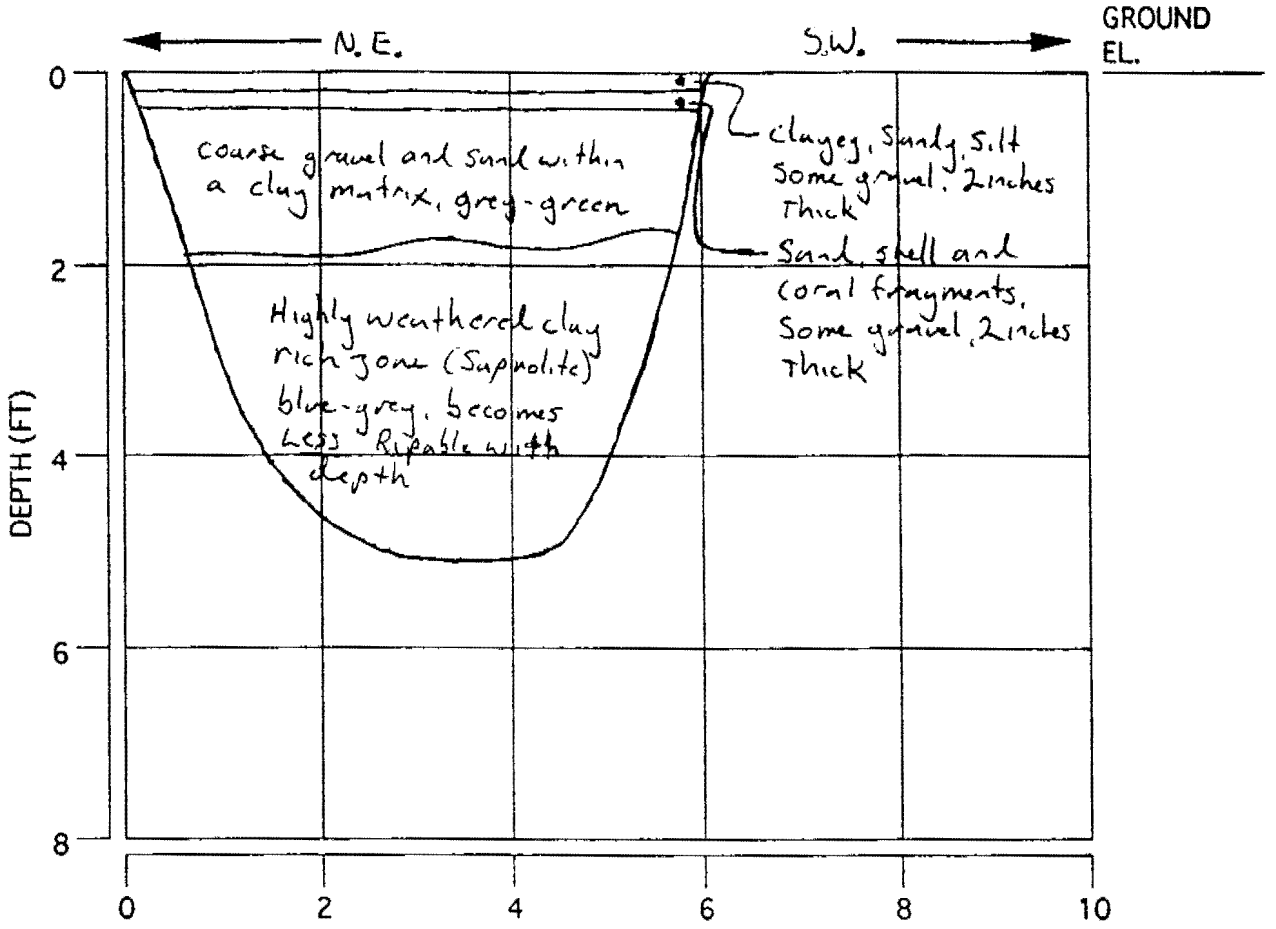
TEST PIT LOGS

TEST PIT LOG

JOB NO. 010661-0001 TEST PIT NO. TP-15-1

PROJECT Site 15, Naval Roosevelt Roads LOCATION 130° N.E of Bldg 90

DATE 29 Oct 92 LOGGED BY R. Hastings



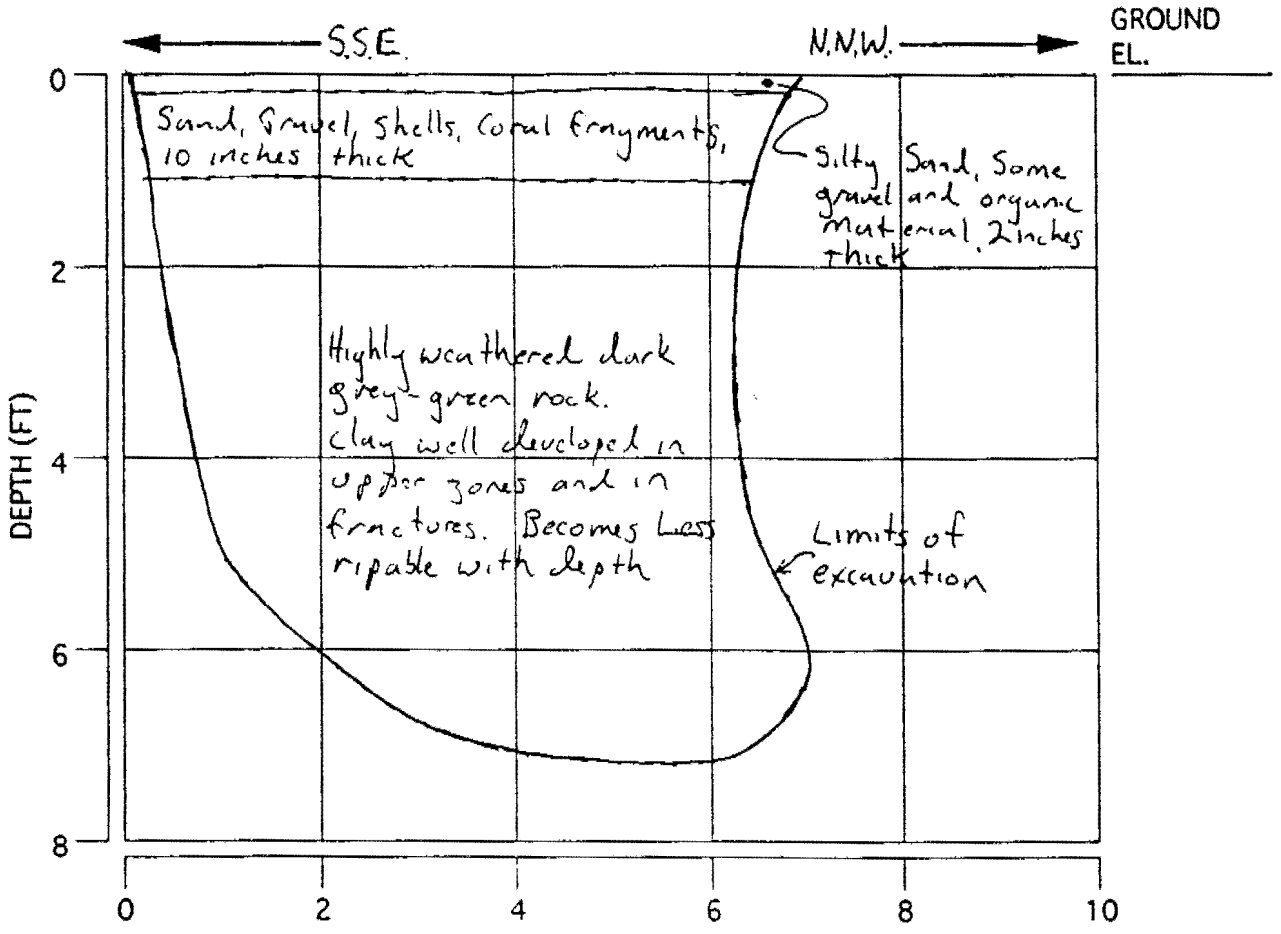
NOTES: Test Pit Located in area mapped as alluvium overlying volcanic breccias, lavas, and tuffs of the Dagvao fm. (USGS Map I 1099). A thin soil has developed on beach deposits overlying a thin (<2ft) alluvium. This alluvium overlys volcanic deposits, primarily andesite, which has weathered to a saprolite in the upper zones.

TEST PIT LOG

JOB NO. 010661-0001 TEST PIT NO. TP-16-1

PROJECT Site 16, Naval Station Roosevelt Roads LOCATION East of Bldg 38, near Road

DATE 29 OCT 92 LOGGED BY B. Hastings



NOTES: Test pit located in area mapped as beach deposits overlying hornblende diorite. (USGS Map I-1099). Upper zones of the diorite have weathered to a saprolite. A thin soil horizon has developed on the beach deposits.

APPENDIX D

SENSITIVE SPECIES EVALUATION

5090
18E-4
28 Oct 92

MEMORANDUM

From: 18E-4
To: 18E-6
Via: 18E sep 10/29/92

Subj: PCB CONTAMINATED SOIL REMOVAL

1. Today I conducted an inspection of the areas around buildings 90 and 38. The soil of these areas is contaminated with PCB's. Mr. Robert McPherson (M & E Comp.) showed me the areas.

2. The predominant vegetation of both areas is Leucaena and Guinea grass. Some large trees like Casuarina, grapefruit and palm trees also exist in the area. None of these plant species are considered threatened or of concern.

3. During the land clearing operations and soil removal, the contractor must implement soil erosion and sediment control measures, such as the installation of sediment fence and straw bales. Also, the contractor must seed the areas once they are filled back. A mixture of rye grass and bermuda grass is recommended. The contractor must include and describe these and any other measures in the project plans and provide us with a copy of it.

4. Please let me know if you need any further assistance.

WINSTON MARTINEZ

APPENDIX E

SOIL TCLP ANALYTICAL RESULTS

Analytical Services Corp.

ANALYTICAL REPORT

CLIENT: Metcalf & Eddy, Inc.

ATTN: R. Hastings

PROJECT: 300519

SAMPLE TYPE(s): Solids

ANALYSIS PERFORMED: Organics and TCLP\RCRA Parameters

DATE RECEIVED: October 30, 1992

JOBLINK(s): #610897

Reviewed and Approved by: Joseph A. Hnatow for *Thomas E. Gran, Ph.D., Vice President* *Date:* 11-13-92

16406 U.S. Route 224 East ■ P.O. Box 1404- ■ Findlay, Ohio 45839-1404 ■ 419-423-3526

APPENDIX A

DATA SUMMARY REPORT

NOTE: The GC/MS screen data, if applicable, is included in Appendix B.

DATA SUMMARY REPORT

DATE: 11/13/92

PAGE: 1

Company: METCALF & EDDY, INC.

	Sample Point ID:	15-20	16-20
	ASC Sample Number:	JJ3573	JJ3574
	Sample Date:	921028	921028
	Facility Code:	300519	300519
Parameters	Units		
RCRA TCLP Leachate Herbicide Analysis, GC, (GS52)			
2,4-D	mg/L	<.250	<.250
2,4,5-TP (Silvex)	mg/L	<.250	<.250
RCRA TCLP Leachate Pesticide Analysis, GC, (GS54)			
Chlordane	mg/L	<.002	<.002
Endrin	mg/L	<.002	<.002
Heptachlor	mg/L	<.002	<.002
Heptachlor epoxide	mg/L	<.002	<.002
Toxaphene	mg/L	<.040	<.040
RCRA TCLP Leachate Metals Analysis, (ME52)			
Arsenic	mg/L	<.100	<.100
Barium	mg/L	.677	.491
Cadmium	mg/L	.020	<.005
Chromium	mg/L	<.020	<.020
Lead	mg/L	<.100	<.100
Mercury	mg/L	<.001	<.001
Selenium	mg/L	<.100	<.100
Silver	mg/L	<.020	<.020
RCRA TCLP Leachate Base/Neutral/Acid Analysis, MS, (MS52)			
2,4-Dinitrotoluene	mg/L	<.100	<.100
Hexachlorobenzene	mg/L	<.100	<.100
Hexachloroethane	mg/L	<.100	<.100
Hexachlorobutadiene	mg/L	<.100	<.100
Lindane	mg/L	<.100	<.100
Methoxychlor	mg/L	<.100	<.100
2-Methylphenol	mg/L	<.100	<.100
4-Methylphenol	mg/L	<.100	<.100
Nitrobenzene	mg/L	<.100	<.100
Pentachlorophenol	mg/L	<.100	<.100
Pyridine	mg/L	<.100	<.100
2,4,5-Trichlorophenol	mg/L	<.100	<.100
2,4,6-Trichlorophenol	mg/L	<.100	<.100

DATA SUMMARY REPORT

DATE: 11/13/92

Company: METCALF & EDDY, INC.

Sample Point ID:	**15-20**	**16-20**
ASC Sample Number:	JJ3573	JJ3574
Sample Date:	921028	921028
Facility Code:	300519	300519

Parameters	Units		
RCRA TCLP Leachate (ZHE) Volatile Analysis, MS, (MV50)			
Benzene	mg/L	<.125	<.125
Carbon tetrachloride	mg/L	<.125	<.125
Chlorobenzene	mg/L	<.125	<.125
Chloroform	mg/L	<.125	<.125
1,4-Dichlorobenzene	mg/L	<.125	<.125
1,2-Dichloroethane	mg/L	<.125	<.125
1,1-Dichloroethylene	mg/L	<.125	<.125
Methyl ethyl ketone	mg/L	<.250	<.250
Tetrachloroethylene	mg/L	<.125	<.125
Trichloroethylene	mg/L	<.125	<.125
Vinyl chloride	mg/L	<.125	<.125

APPENDIX B

QUANTITATIVE RESULTS

RCRA TCLP Leachate Herbicide Analysis, GC, (GS52)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	15-20	JJ3573

Compounds	Sample Results mg/L	Bias Corrected Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
2,4-D	ND	-	.250	ND	Q7H6287R	12
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H6287R	12

RCRA TCLP Leachate Herbicide Analysis, GC, (GS52)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	16-20	JJ3574

Compounds	**Sample Results** mg/L	**Bias Corrected Results** mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
2,4-D	ND	-	.250	ND	Q7H6287R	128
2,4,5-TP (Silvex)	ND	-	.250	ND	Q7H6287R	127

RCRA TCLP Leachate Pesticide Analysis, GC, (GS54)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	15-20	JJ3573

Compounds	**Sample Results** mg/L	**Bias Corrected Results** mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
Chlordane	ND	-	.002	ND	Q7P6300	111
Endrin	ND	-	.002	ND	Q7P6300	101
Heptachlor	ND	-	.002	ND	Q7P6300	83
Heptachlor epoxide	ND	-	.002	ND	Q7P6300	99
Toxaphene	ND	-	.040	ND	Q7P6300	94

RCRA TCLP Leachate Pesticide Analysis, GC, (GS54)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	16-20	JJ3574

Compounds	Sample Results mg/L	Bias Corrected Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
Chlordane	ND	-	.002	ND	Q7P6300	111
Endrin	ND	-	.002	ND	Q7P6300	101
Heptachlor	ND	-	.002	ND	Q7P6300	83
Heptachlor epoxide	ND	-	.002	ND	Q7P6300	99
Toxaphene	ND	-	.040	ND	Q7P6300	94

RCRA TCLP Leachate Metals Analysis, (ME52)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	15-20	JJ3573

Compounds	**Sample Results** mg/L	**Bias Corrected Results** mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
Arsenic	ND	-	.100	ND	Q7M1682	96
Barium	.652	.677	.100	ND	Q7M1682	96
Cadmium	.019	.020	.005	ND	Q7M1682	95
Chromium	ND	-	.020	ND	Q7M1682	92
Lead	ND	-	.100	ND	Q7M1682	93
Mercury	ND	-	.001	ND	Q7G1695	96
Selenium	ND	-	.100	ND	Q7M1682	98
Silver	ND	-	.020	ND	Q7M1682	84

RCRA TCLP Leachate Metals Analysis, (ME52)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	16-20	JJ3574

Compounds	Sample Results mg/L	Bias Corrected Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
Arsenic	ND	-	.100	ND	Q7M1682	9
Barium	.473	.491	.100	ND	Q7M1682	9
Cadmium	ND	-	.005	ND	Q7M1682	9
Chromium	ND	-	.020	ND	Q7M1682	9
Lead	ND	-	.100	ND	Q7M1682	9
Mercury	ND	-	.001	ND	Q7G1695	9
Selenium	ND	-	.100	ND	Q7M1682	9
Silver	ND	-	.020	ND	Q7M1682	8

RCRA TCLP Leachate Base/Neutral/Acid Analysis, MS, (MS52)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	15-20	JJ3573

Compounds	Sample Results mg/L	Bias Corrected Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
2,4-Dinitrotoluene	ND	-	.100	ND	Q7C6271	11
Hexachlorobenzene	ND	-	.100	ND	Q7C6271	9
Hexachloroethane	ND	-	.100	ND	Q7C6271	4
Hexachlorobutadiene	ND	-	.100	ND	Q7C6271	5
Lindane	ND	-	.100	ND	Q7C6271	9
Methoxychlor	ND	-	.100	ND	Q7C6271	9
2-Methylphenol	ND	-	.100	ND	Q7C6271	7
4-Methylphenol	ND	-	.100	ND	Q7C6271	7
Nitrobenzene	ND	-	.100	ND	Q7C6271	8
Pentachlorophenol	ND	-	.100	ND	Q7C6271	14
Pyridine	ND	-	.100	ND	Q7C6271	5
2,4,5-Trichlorophenol	ND	-	.100	ND	Q7C6271	8
2,4,6-Trichlorophenol	ND	-	.100	ND	Q7C6271	9

3-Methyl- and 4-Methylphenol coelute and are reported as the total

RCRA TCLP Leachate Base/Neutral/Acid Analysis, MS, (MS52)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	16-20	JJ3574

Compounds	Sample Results mg/L	Bias Corrected Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bia Reco
2,4-Dinitrotoluene	ND	-	.100	ND	Q7C6271	11
Hexachlorobenzene	ND	-	.100	ND	Q7C6271	9
Hexachloroethane	ND	-	.100	ND	Q7C6271	4
Hexachlorobutadiene	ND	-	.100	ND	Q7C6271	5
Lindane	ND	-	.100	ND	Q7C6271	9
Methoxychlor	ND	-	.100	ND	Q7C6271	9
2-Methylphenol	ND	-	.100	ND	Q7C6271	7
4-Methylphenol	ND	-	.100	ND	Q7C6271	7
Nitrobenzene	ND	-	.100	ND	Q7C6271	8
Pentachlorophenol	ND	-	.100	ND	Q7C6271	14
Pyridine	ND	-	.100	ND	Q7C6271	5
2,4,5-Trichlorophenol	ND	-	.100	ND	Q7C6271	8
2,4,6-Trichlorophenol	ND	-	.100	ND	Q7C6271	9

3-Methyl- and 4-Methylphenol coelute and are reported as the total

RCRA TCLP Leachate (ZHE) Volatile Analysis, MS, (MV50)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	15-20	JJ3573

Compounds	Sample Results mg/L	Bias Corrected Results mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
Benzene	ND	-	.125	ND	Q7V2099	98
Carbon tetrachloride	ND	-	.125	ND	Q7V2099	92
Chlorobenzene	ND	-	.125	ND	Q7V2099	100
Chloroform	ND	-	.125	ND	Q7V2099	100
1,4-Dichlorobenzene	ND	-	.125	ND	Q7V2099	85
1,2-Dichloroethane	ND	-	.125	ND	Q7V2099	110
1,1-Dichloroethylene	ND	-	.125	ND	Q7V2099	92
Methyl ethyl ketone	ND	-	.250	ND	Q7V2099	77
Tetrachloroethylene	ND	-	.125	ND	Q7V2099	96
Trichloroethylene	ND	-	.125	ND	Q7V2099	101
Vinyl chloride	ND	-	.125	ND	Q7V2099	97

RCRA TCLP Leachate (ZHE) Volatile Analysis, MS, (MV50)

Company Name	Facility	Sample Point	ASC Sample No.
METCALF & EDDY, INC.	300519	16-20	JJ3574

Compounds	**Sample Results** mg/L	**Bias Corrected Results** mg/L	Detection Limits mg/L	Blank Results mg/L	Batch Number	Bias Recov
Benzene	ND	-	.125	ND	Q7V2099	98
Carbon tetrachloride	ND	-	.125	ND	Q7V2099	92
Chlorobenzene	ND	-	.125	ND	Q7V2099	10C
Chloroform	ND	-	.125	ND	Q7V2099	10C
1,4-Dichlorobenzene	ND	-	.125	ND	Q7V2099	85
1,2-Dichloroethane	ND	-	.125	ND	Q7V2099	11C
1,1-Dichloroethylene	ND	-	.125	ND	Q7V2099	92
Methyl ethyl ketone	ND	-	.250	ND	Q7V2099	77
Tetrachloroethylene	ND	-	.125	ND	Q7V2099	96
Trichloroethylene	ND	-	.125	ND	Q7V2099	101
Vinyl chloride	ND	-	.125	ND	Q7V2099	97

APPENDIX C

QUALITY ASSURANCE DATA

SUMMARY OF ANALYTICAL METHODOLOGY

Parameter	Reference	Method
Organics		
Polychlorinated Biphenyls (PCBs) by GC	SW-846	8080
RCRA TCLP		
Leachate Preparation	SW-846	1311
Herbicides by GC	SW-846	8150 (1)
Pesticides by GC	SW-846	8080
Metals (except mercury)	SW-846	6010
Mercury by Cold Vapor	SW-846	7470
Semi-volatile Compounds by GC/MS	SW-846	8270
Volatile Compounds by GC/MS	SW-846	8240

METHODOLOGY REFERENCES

ASTM	*American Society for Testing and Materials*, 1985, edition.
CAWW	*Methods for Chemical Analysis of Water and Wastes*, April 1979 and Updated #1 March 1983.
CLP	*USEPA Contract Laboratory Program*, Document #OLMO1.0, updates December 1990 #OLMO1.1 and February 1991 #OLMO1.1.1.
NIOSH	*National Instituted for Occupational Safety and Health*, 3rd edition, 1984.
SMEWW	*Standard Methods for the Examination of Water and Wastewater*, 17th edition, 1989.
STOA	*Spot Tests In Organic Analysis*, 7th edition, 1966.
SW-846	*Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods*, 3rd edition, September 1986 and Updated #1 January 1989.
(1)	This method was modified to incorporate the use of Boron Trifluoride (BF3) as the derivatizing reagent according to Method 509B in *SMEWW*, 17th edition, 1989.
Title 22	*Waste Extraction Test*, Title 22, Section 66261.126 Appendix 2 of the California Administrative Code, May 1991.

ANALYTICAL SERVICES CORP.

Certifications

(for Conventionals, Metals and Organic compounds)

State	Agency	Certification #
California	CADOH	1178
Kansas	KSDHE	E-202 & E-1173
Louisiana	LADOHH	92-10
Massachusetts	MADEP	OH113
New Jersey	NJDEP	74603
New York	NYDOH	10712
North Carolina	NCDEM	392
Ohio	OHEPA	OH113
Pennsylvania	PADER	68-450
South Carolina	SCDEH	92002
Tennessee	TNDOH	2978
Wisconsin	WIDNR	999037160

Validated by:

- o US Army Corps of Engineers

Approvals:

- o Waste Characterization Analysis
  - Chemical Waste Management
  - Envirosafe
- o Permit for Importing Soils
  - USDA

REPORT KEY

mg/kg	= milligram per kilogram (ppm)
ug/kg	= microgram per kilogram (ppb)
mg/L	= milligram per liter (ppm)
ug/L	= microgram per liter (ppb)
pCi/l	= picocurie per liter
mg/W	= milligram per wipe
ug/W	= microgram per wipe
ug/S	= microgram per sample
ppm	= parts per million
ppb	= parts per billion
ND	= Not detected at or above stated detection limit
<	= less than
>	= greater than
%	= percent
BTU/lb	= British Thermal Units per pound
Deg. C	= Degrees Celsius
gm/cc	= grams per cubic centimeter
n/a	= not applicable
std	= result is relative to standard pH units
CV	= Conventionals
IR	= Infrared Spectrophotometric
GC	= Gas Chromatograph Instrument
GC/MS	= Gas Chromatography/Mass Spectrometer Instrument
PCB	= Polychlorinated Biphenyls (PCBs)
EP TOX	= Extraction Procedure Toxicity
TCLP	= Toxicity Characteristic Leaching Procedure
RCRA	= Resource Conservation and Recovery Act

QUALITY ASSURANCE DATA

RCRA TCLP LEACHATE HERBICIDE ANALYSIS, GC, (GS52)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
2,4-D	ND	101	ND	128	3	Q7H6287R
2,4,5-TP (Silvex)	ND	108	ND	127	0	Q7H6287R

Due to sample matrix interferences, the spiked sample does not provide valid spike recovery data. Batch acceptance based on QC spike recovery

Quality Assurance Data

RCRA TCLP Leachate Pesticide Analysis, GC, (GS54)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
Chlordane	ND	125	ND	111	2	Q7P6300
Endrin	ND	108	ND	101	3	Q7P6300
Heptachlor	ND	94	ND	83	1	Q7P6300
Heptachlor epoxide	ND	109	ND	99	2	Q7P6300
Toxaphene	ND	-	ND	94	-	Q7P6300

QUALITY ASSURANCE DATA

RCRA TCLP LEACHATE METALS ANALYSIS, (ME52)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
Arsenic	ND	94	ND	96	1	Q7M1682
Barium	ND	98	.652	96	1	Q7M1682
Cadmium	ND	95	.019	95	0	Q7M1682
Chromium	ND	97	ND	92	1	Q7M1682
Lead	ND	97	ND	93	1	Q7M1682
Mercury	ND	89	ND	96	1	Q7G1695
Selenium	ND	93	ND	98	2	Q7M1682
Silver	ND	93	ND	84	1	Q7M1682

Quality Assurance Data

RCRA TCLP Leachate Base/Neutral/Acid Analysis, MS, (MS52)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
2,4-Dinitrotoluene	ND	103	ND	110	8	Q7C6271
Hexachlorobenzene	ND	116	ND	94	6	Q7C6271
Hexachloroethane	ND	61	ND	45	5	Q7C6271
Hexachlorobutadiene	ND	85	ND	57	5	Q7C6271
Lindane	ND	100	ND	91	9	Q7C6271
Methoxychlor	ND	100	ND	96	2	Q7C6271
2-Methylphenol	ND	81	ND	78	4	Q7C6271
4-Methylphenol	ND	77	ND	73	9	Q7C6271
Nitrobenzene	ND	91	ND	83	6	Q7C6271
Pentachlorophenol	ND	145	ND	148	21	Q7C6271
Pyridine	ND	62	ND	55	15	Q7C6271
2,4,5-Trichlorophenol	ND	84	ND	88	39	Q7C6271
2,4,6-Trichlorophenol	ND	91	ND	90	38	Q7C6271

3-Methyl- and 4-Methylphenol coelute and are reported as the total

Quality Assurance Data

RCRA TCLP Leachate (ZHE) Volatile Analysis, MS, (MV50)

Compounds	Blank Results mg/L	Blank Spike Recov	Unspiked Sample Results mg/L	Matrix Spike Recov	Relative Percent Diff	Batch Number
Benzene	ND	96	ND	98	1	Q7V2099
Carbon tetrachloride	ND	92	ND	92	1	Q7V2099
Chlorobenzene	ND	98	ND	100	1	Q7V2099
Chloroform	ND	100	ND	100	1	Q7V2099
1,4-Dichlorobenzene	ND	84	ND	85	2	Q7V2099
1,2-Dichloroethane	ND	109	ND	110	1	Q7V2099
1,1-Dichloroethylene	ND	92	ND	92	2	Q7V2099
Methyl ethyl ketone	ND	75	ND	77	4	Q7V2099
Tetrachloroethylene	ND	95	ND	96	1	Q7V2099
Trichloroethylene	ND	100	ND	101	1	Q7V2099
Vinyl chloride	ND	97	ND	97	1	Q7V2099

QUALITY ASSURANCE DATA
SURROGATE SUMMARY REPORT

SURROGATE ID	A159	B732	A121	A884	A158	B142	# OUT
QC BATCH: Q7C6271 **Leachate (Semi-Volatile organics by MS)**							
SAMPLE ID							
15-20	96	92	111	107	95	101	0
15-20 MD	80	82	129	89	114	101	0
15-20 MS	81	78	108	87	78	91	0
16-20	85	68	99	84	80	81	0
BLANK	92	83	112	99	99	45	0
BLANK SPIKE	102	100	120	114	104	113	0
QC LIMITS	(42-131)	(31-144)	(55-145)	(58-135)	(60-142)	(24-150)	

SURROGATE ID	B516	# OUT
QC BATCH: Q7H6287R **Leachate (Herbicide compounds by GC)**		
SAMPLE ID		
15-20	111	0
15-20 MD	121	0
15-20 MS	112	0
16-20	111	0
BLANK	98	0
BLANK SPIKE	110	0
QC LIMITS	(82-150)	

SURROGATE ID	B816	A500	# OUT
QC BATCH: Q7P6300 **Leachate (Pesticide compounds by GC)**			
SAMPLE ID			
15-20	101	120	0
15-20 MD	97	118	0
15-20 MS	97	119	0
16-20	100	117	0
BLANK	101	120	0
BLANK SPIKE	106	123	0
QC LIMITS	(55-117)	(10-150)	

SURROGATE ID

A047 = 1,2-Dichloroethane-D4
B185 = Toluene-D8
B668 = Bromofluorobenzene
A159 = 2-Fluorophenol
B732 = Phenol-D6
A121 = 2,4,6-Tribromophenol
A884 = Nitrobenzene-D5
A158 = 2-Fluorobiphenyl
B142 = Terphenyl-D14
B816 = 2,4,5,6-Tetrachloro-m-xylene
A500 = Decachlorobiphenyl
B516 = 2,4-DB

* Values outside of laboratory quality control limits
D Surrogate diluted out

It is ASC's laboratory policy to allow one surrogate per sample fraction (acid, base-neut: or volatile) to exceed the stated QC limits. This policy is based upon the USEPA SOW for the Contract Laboratory Program (CLP).

QUALITY ASSURANCE DATA
SURROGATE SUMMARY REPORT

SURROGATE ID	A047	B185	B668	# OUT
QC BATCH: Q7V2099 **Leachate (Volatile organics by MS)**				
SAMPLE ID				
15-20	87	98	98	0
16-20	86	97	96	0
BLANK	96	98	96	0
BLANK SPIKE	88	97	98	0
C4602 MD	88	99	98	0
C4602 MS	86	97	97	0
QC LIMITS	(77-114)	(71-121)	(87-110)	

SURROGATE ID

A047 = 1,2-Dichloroethane-D4
B185 = Toluene-D8
B668 = Bromofluorobenzene
A159 = 2-Fluorophenol
B732 = Phenol-D6
A121 = 2,4,6-Tribromophenol
A884 = Nitrobenzene-D5
A158 = 2-Fluorobiphenyl
B142 = Terphenyl-D14
B816 = 2,4,5,6-Tetrachloro-m-xylene
A500 = Decachlorobiphenyl
B516 = 2,4-DB

* Values outside of laboratory quality control limits
D Surrogate diluted out

It is ASC's laboratory policy to allow one surrogate per sample fraction (acid, base-neutr or volatile) to exceed the stated QC limits. This policy is based upon the USEPA SOW for the Contract Laboratory Program (CLP).

APPENDIX D

CHAIN-OF-CUSTODY RECORD(S)

OHM Corporation

CHAIN-OF-CUSTODY RECORD

Form 0019
Field Technical Services
Rev. 08/89

№ 112391

O.H. MATERIALS CORP. • P.O. BOX 551 • FINDLAY, OH 45839-0551 • 419-423-3526

PROJECT NAME	PROJECT LOCATION
New Sta RR Sites 15 & 16	Roosevelt Rends, Puerto Rico

PROJ. NO	PROJECT CONTACT	PROJECT TELEPHONE NO.
010661	R. Hastings	404 881-8010

CLIENT'S REPRESENTATIVE	PROJECT MANAGER/SUPERVISOR
J. Seykman	R. Hastings

ITEM NO	SAMPLE NUMBER	DATE	TIME	COMP	GRAB	SAMPLE DESCRIPTION (INCLUDE MATRIX AND POINT OF SAMPLE)	NUMBER OF CONTAINERS	ANALYSIS DESIRED (INDICATE SEPARATE CONTAINERS) PCB 8080	TCLP (FULL)	REMARKS
1	15-01	10-28	0925		✓	Soil Sample 15-01	1-8oz	X		
2	15-03	10-28	0955		✓	Soil Sample 15-03	1-8oz	X		
3	15-05	10-28	1020		✓	Soil Sample 15-05	1-8oz	X		
4	15-06	10-28	1035		✓	Soil Sample 15-06	1-8oz	X		
5	16-06	10-28	1600		✓	Soil Sample 16-06	1-8oz	X		
6	16-07	10-28	1610		✓	Soil Sample 16-07	1-8oz	X		
7	16-09	10-28	1630		✓	Soil Sample 16-09	1-8oz	X		
8	16-09B	10-28	1630		✓	Soil Sample 16-09	1-8oz	X		
9	15-20	10-28	1700	✓		Soil Composite Site 15	1-Qt	X		
10	16-20	10-28	1700	✓		Soil Composite Site 16	1-Qt	X		

TRANSFER NUMBER	ITEM NUMBER	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME
1	1	[signature]	To Federal Express #		400
2	1-10	Fedex	[signature]	10-30-89	1108
3					
4					

REMARKS

8927-1812

Temp 10°C

SAMPLER'S SIGNATURE

LAB COPY