Sediment Characterization Report
Terminal 4, Berths 401 and 410
11040 N. Lombard Street
Portland, Oregon

Prepared for
Port of Portland

July 11, 2012
15753-00

HARTCROWSER

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Prepared by
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CONTENTS

TABLES

CONTENTS (Continued)

FIGURES

APPENDIX A
SEDIMENT CORE LOGS

APPENDIX B
QUALITY ASSURANCE REVIEW

APPENDIX C
ANALYTICAL LABORATORY REPORT

ACRONYMS

ARI	Analytical Resources, Inc.
BEHP	*bis*(2-ethylhexyl)phthalate
BUD	Beneficial Use Determination
CCV	Continuing Calibration Verification
COC	chemical of concern
Corps	U.S. Army Corps of Engineers
CRD	Columbia River Datum
DEQ	Oregon Department of Environmental Quality
DMMU	Dredge material management unit
EPA	Environmental Protection Agency
GPS	global positioning system
HPAH	High molecular weight polycyclic aromatic hydrocarbons
IS	Internal Standard
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
MDL	method detection limit
µg/kg	micrograms per kilogram
MRL	method reporting limit
MS	matrix spike
MSD	matrix spike duplicate
NSM	new surface material
NUC	Northwest Underwater Construction
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
Port	Port of Portland
PSET	Portland Sediment Evaluation Team
QA/QC	quality assurance/quality control
RPD	relative percent difference
RSD	Relative Standard Deviation
SAP	Sampling and Analysis Plan
SEF	Sediment Evaluation Framework for the Pacific Northwest
SL	screening level
SRM	Standard Reference Material
SVOC	semivolatile organic compound
TBT	tributyltin
TOC	total organic carbon
Total DDx	DDT, DDE, and DDD
TPH	total petroleum hydrocarbons

SEDIMENT CHARACTERIZATION REPORT
TERMINAL 4, BERTHS 401 AND 410
11040 N. LOMBARD STREET, PORTLAND, OREGON

1.0 INTRODUCTION

The Port of Portland (Port) proposes to conduct a maintenance dredging event at Berths 401 and 410 at Terminal 4 along the Willamette River in Portland, Oregon (Figure 1). To provide chemical quality data on sediment to be dredged and the future "leave surface" or new surface material (NSM), sediment characterization activities were completed in accordance with the Sediment Evaluation Framework (SEF) for the Pacific Northwest (U.S. Army Corps of Engineers [Corps] et al., 2009) and our Sampling and Analysis Plan (SAP) (Hart Crowser, 2012). This report presents the results and findings of these activities.

1.1 Terminal 4 and Berth Descriptions

Terminal 4 is located at 11040 N. Lombard Street in Portland, Oregon, on the east bank of the Willamette River between River Miles 4 and 5.5. Berth 401, located downstream of Slip 1, was previously used by a grain handling facility (Cargill, Inc.) until 2004. Currently, the berth is occasionally used as a lay berth. Berths 410 and 411 are located within Slip 3 and used by Kinder Morgan for loading soda ash (sodium carbonate) for export. Berths 414, 415, and 416 at Terminal 4 are located further upstream. The proposed project includes only Berths 401 and 410.

Figure 2 shows Berth 401 and its bathymetry based on a July 2011 survey conducted by the Port. The berthing area ranges from 1,127 to 1,427 feet long and is 150 feet wide. The river bottom within the berthing area varies from approximately -35 to -57 feet, relative to the Columbia River Datum (CRD). The design depth of Berth 401 is -41 feet CRD, with 2 feet of overdredge allowance. The proposed maximum permitted depth is -44 feet CRD.

The bathymetry for Berth 410, as well as the rest of Slip 3, is shown on Figure 3. The berthing area for Berth 410 is generally the western portion of the north side of Slip 3 and extends 200 to 300 feet from the berthing wall. Currently, the river bottom within the berthing area varies from -36 to -61 feet CRD based on the Port survey in 2011. The design depth of Berth 410 is -41 feet CRD, with 2 feet of overdredge allowance. The proposed maximum permitted depth is -44 feet CRD.

1.2 Previous Sediment Characterization Activities

Previous sediment characterization and berth maintenance events for Berths 401 and 410 are discussed in the SAP (Hart Crowser, 2012). Berth 401 was last dredged in 1988. Berth 410 undergoes routine maintenance dredging, with the last dredging event occurring in 2008 as part of a removal action conducted in and near Slip 3 (Anchor 2009).

Previous sampling data from Berth 401 have detected mercury, zinc, tributyltin (TBT), *bis*(2-ethylhexyl)phthalate (BEHP), DDT, and polychlorinated biphenyls (PCBs) above SEF screening levels (SLs). Upon evaluation, the SAP identified TBT and BEHP as the primary chemicals of concern (COCs) at Berth 401. TBT was detected above SLs only in subsurface sediments and is likely localized near the middle of the berth. BEHP was also present in the dredge prism sediments. The other compounds (metals, DDT, and total PCBs) were detected infrequently above SLs. Based on the COC exceedances and berth use, a "moderate" to "high" rank was proposed for Berth 401 in accordance with Table 4-2 of the SEF (Corps, et al. 2009). The Portland Sediment Evaluation Team (PSET) indicated that a "high" ranking was appropriate PSET (2012).

For Berth 410, previous sediment characterization studies detected relatively high concentrations of polycyclic aromatic hydrocarbon (PAHs). Other contaminants include metals (cadmium, lead, silver, and zinc), BEHP, DDx (DDT and its breakdown products DDD and DDE), and PCBs. Chemical data from two cores performed in 2007 detected zinc, high molecular weight PAHs (HPAHs), and total PCBs above SLs near the middle of Berth 410 (Anchor, 2008). These compounds are COCs for Berth 410. Sediment quality at Berth 410 toward the mouth of Slip 3 was below SEF SLs. Based on the previous presence of COCs, we assigned a "high" rank to the berth in accordance with Table 4-2 of the SEF. PSET (2012) concurred with this ranking.

1.3 Project Description

Maintenance dredging is needed due to the gradual and persistent deposition of river sediment in the berthing areas that compromise the authorized navigational depth clearances required for ships. Dredging is imperative for Berth 410 as it is currently used. Berth 401 is used only occasionally as a lay berth; however, the Port anticipates putting this berth back in active use soon. The Port will be submitting a Joint Permit Application (JPA) to the Corps and Oregon Department of State Lands to obtain the necessary permits to perform maintenance dredging of these berths.

In-water dredging activities will be performed during the Willamette River in-water work window from July 1 to October 31. Figures 2 and 3 show the sediment areas requiring dredging for Berths 401 and 410, respectively. Dredging would be conducted to -41 feet CRD with a permitted 2 feet of overdredge for advanced maintenance and inherent dredging accuracy (i.e., to -43 feet CRD). The NSM, which is equivalent to the pay depth (i.e., the depth to which the dredging contractor is paid for material removed), is anticipated to average -42 feet CRD. As such, the estimated maximum dredging volumes for Berths 401 and 410 are 20,000 and 15,000 cubic yards, respectively. While the maximum depth of dredging is anticipated to be -43 feet CRD, the Port will be requesting a proposed maximum permitted depth of -44 feet CRD to account for occasional smaller areas that may exceed the maximum dredging depth of -43 feet CRD.

The Port will use its standard berth dredging methods, which are designed and have been previously demonstrated to minimize water quality impacts. A clamshell dredge will remove sediments using a close-lipped bucket operated either from the dock or from a floating crane. The depth and position of the bucket and dredge would be monitored by visual and positioning computer systems, including a global positioning system (GPS). The dredge material will be placed in a barge and transported for placement at an upland placement facility (West Hayden Island Placement Facility or Suttle Road Rehandling Facility), or another approved beneficial use site. For material that is unsuitable for these placement options, the material will be transported for disposal at a solid waste (RCRA Subtitle D) landfill. During dredge material handling, transport, or placement, it is not anticipated that return water flows to the Willamette or Columbia Rivers will be generated.

2.0 SEDIMENT CHARACTERIZATION OBJECTIVES

The overall objective of this sediment characterization study was to characterize the quality of the proposed dredge material and NSM. Specific objectives of the study were to:

- Characterize sediment affected by proposed dredging activities along the berths (i.e., the dredge prisms) to document the quality of the sediments;
- Additionally, characterize the underlying NSMs (a.k.a. leave surfaces) along the berths to document the chemical quality of these remaining sediments;
- Collect, handle, and analyze samples representative of the dredge prisms and NSM sediments in accordance with the SEF;
- Compare the sediment analytical results to applicable SLs to evaluate the nature of the dredge prisms and NSM sediments; and

- Evaluate and report the results of the analytical sediment testing in a complete and timely manner to support the necessary maintenance dredging activities.

Sediment characterization activities were conducted in accordance with our SAP (Hart Crowser, 2012), comments from PSET (PSET, 2012), the SEF, and an EPA technical manual for sediment sampling (EPA, 2001). Quality assurance/quality control (QA/QC) procedures described in our Quality Assurance Project Plan in the SAP were followed.

3.0 SAMPLING AND ANALYSIS ACTIVITIES

This section summarizes the sampling activities and presents the analytical program for the dredge prism and NSM samples obtained at Berths 401 and 410 at Terminal 4. Our activities also included collecting a reference sample in the Willamette River for contingency biological testing.

3.1 Sediment Core Sampling

On May 8 and 9, 2012, Northwest Underwater Construction (NUC) of Vancouver, Washington (under subcontract to Hart Crowser), obtained sediment cores three cores each from Berths 401 and 410 (Figures 2 and 3, respectively). A representative of Hart Crowser was present to observe and document the coring activities and to collect dredge prism and NSM samples for analysis.

Positioning. Horizontal positioning was performed using differential GPS. Prior to field deployment, the coordinates of the proposed core locations were uploaded into the GPS unit. The vessel was then positioned and anchored as close to the proposed locations and the actual field coordinates where recorded at the time of coring. Actual positions were within approximately 10 feet of planned positions. While positioned over the sample location, vertical measurements to the sediment surface (i.e., mudline) were made using a weighted tape (lead line). These depth-to-mudline measurements were used to calculate a mudline CRD elevation by referencing a United States Geological Survey (USGS) river gauging station on the Willamette River (Morrison Bridge Station 14211720). The mudline elevations were generally within 0.5 feet of those estimated from the July 2011 bathymetry except at core location 401B which was 1.5 feet different. Table 1 presents the core coordinates and mudline elevations.

Field Coring Procedures. Cores were obtained using a vibracorer with a 4-inch-diameter core barrel deployed from a sampling vessel operated by NUC. Cores were advanced from 9 to 10 feet at Berth 401 and from 5.6 to 7.3 feet at Berth

410, penetrating through the proposed dredge prism and into the underlying NSM that will remain after dredging. Sediment was contained in a polycarbonate liner inside of the core barrel.

Upon retrieval of the vibracorer, the liner with core was removed from the core barrel, the overlying water was drained, and the ends sealed with caps. The sediment core was examined for acceptance. To obtain sufficient sediment for contingency biological testing, two cores were needed from each core location. Acceptable cores used for sampling had core recoveries ranged from 70 to 100 percent. The two cores from location 401A (Figure 2) had slightly less than the preferred minimum recovery of 75 percent, but these cores were used as they were the best of five attempts retrieved from this location. The lower recoveries appeared to be due to core compaction, and the dredge prism and NSM are believed to be well represented.

Table 1 presents the sediment sampling information, including core identification, penetration, percent recovery, and target sample intervals. The sediment cores were then transported to our office for processing.

Core Processing for Samples. Per the SAP (Hart Crowser, 2012), each core location represents a separate dredged material management unit (DMMU); as such, one dredge prism sample and one NSM sample was collected, as described below, for each DMMU (i.e., for each core location). In the processing area, the core were opened by splitting the core liner lengthwise; sediment was then photographed and described including, as appropriate, physical description, odor, visual stratification, debris, and biological activity. Logs of the cores are included in Appendix A. The percent recovery was re-measured to derive a compaction correction factor to apply for determining the sample intervals. Sample intervals were also based on the field-determined mudline elevations (Table 1).

Dredge Prism Samples. After logging, the following procedures were used to sample dredge prism sediments from the two cores obtained from each core location. A discrete sample was obtained from one core for sulfide analyses, generally near the upper third of the Berth 401 cores and toward the bottom of the Berth 410 cores (sediments for sulfide analyses cannot be mixed). Sediment representing the entire depth of the dredge prism from the two cores was then placed into a stainless steel bowl and homogenized with a stainless steel spoon until both color and texture were uniform. The homogenized contents from the cores were then sampled. The sulfide and homogenized dredge prism samples were both labeled with the berth designation, core location, and the suffix DP for maintenance dredge prism (e.g., 401A/DP).

NSM Samples. The sampling procedure above was also used for the NSM samples. The NSM sample interval generally consisted of a 2-foot interval (-42 to -44 feet CRD) below the dredge prism. Due to the mudline being higher than expected at core location 401B, only 1.5 feet of NSM sediments was penetrated (Table 1). A discrete sulfide sample was obtained midway in the NSM interval from one of the two cores, and the NSM intervals of the two cores were then homogenized and sampled. The sulfide and homogenized NSM sediment samples were both labeled with the berth designation, core location, and the suffix NSM (e.g., 401A/NSM).

3.2 Reference Sediment Sampling

On May 9, 2012, we collected reference sediment for contingency biological testing from Willamette River mile 19.5 near Elk Rock Island. NUC (under subcontract to Hart Crowser) used a grab sampler to obtain the sample from the upper 6.5 inches of sediment. Reference sediment was comprised of a slightly sandy silt. A sulfide sample was first obtained from sediment retrieved by the grab sampler. The sediment was placed in a stainless steel bowl, homogenized, and then transferred into sample containers for chemical and possible biological testing. Table 1 presents reference sample identification ("Reference"), coordinates, and mudline depth.

3.3 Analytical Program

Samples collected in Section 3.1 and 3.2 were submitted for chemical analysis under chain of custody to Analytical Resources, Inc. (ARI), of Tukwila, Washington (under subcontract to Hart Crowser). Sediment samples for contingency biological testing were archived (refrigerated) at our office pending chemical analyses results. Based on the results, biological testing was not performed.

3.3.1 Dredge Prism Samples

Dredge prism samples for the each core location (i.e., each representing a DMMU) were analyzed to assess the chemical quality of dredge prism, evaluate whether sediments could qualify for in-water placement, and perform an Oregon Department of Environmental Quality (DEQ) beneficial use determination (BUD) for upland placement. The samples were analyzed for the physical and chemical analyses listed below.

- Grain size by ASTM D 421/422;
- Total solids by EPA Method 160.3;
- Total organic carbon (TOC) by Plumb (1981);

- Ammonia by EPA Method 350.1M;
- Sulfide by EPA Method 376.2;
- Total petroleum hydrocarbons (TPH) as diesel and oil by Northwest Method NWTPH-Dx with a silica gel cleanup;
- Total metals (antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc) by EPA Method 200.8/7471A;
- TBT in bulk sediment by Krone, et al. (written 1988; published 1989);
- PAHs by EPA Method 8270D-SIM;
- Semivolatile organic compounds (SVOCs) by EPA Method 8270D;
- Organochlorine pesticides by EPA Method 8081A; and
- PCBs by EPA Method 8082.

3.3.2 NSM Samples

To fully characterize the NSM at Berths 401 and 410, NSM samples were analyzed for the full suite of chemical analyses listed above except TPH and PAHs. TPH analysis was only conducted on dredge prism samples for the beneficial use determination. Additionally, PAH analyses by EPA Method 8270-SIM is performed to best meet upland risk-based criteria. SVOC analyses provided PAH data, with method detection limits (MDLs) being sufficiently low to meet SEF SLs.

3.3.3 Reference Sample

Due to holding time constraints and the possibility that biological testing might be performed, we analyzed the reference sample for total solids, ammonia, and total sulfides.

3.4 Modifications to the SAP

Field activities and the analytical program were conducted in accordance with the SAP (Hart Crowser, 2012). As explained below, minor modifications were made to the field and sampling program as necessitated by field conditions.

- A ship was present at Berth 401 and will be for at least several more months; as such, core location 401B as presented in the SAP could not be performed. This condition was anticipated in the SAP and an alternate core location (401B-Alt) was proposed. This alternate location was cored and is called 401B in this report.

- The calculated mudline elevation for core location 401B was 1.5 feet higher than the estimated elevation based on the July 2011 bathymetry. To accommodate variability in mudline elevations such as this, we typically drive the vibracore deeper than stated in the SAP. For 401B, the vibracore was driven 1 foot deeper to the maximum vibracore length of 10 feet. Still, this left only 1.5 feet of NSM sediment being recovered instead of the 2 feet stated in the SAP. We believe that this slightly shorter NSM interval, however, is representative of the NSM.

4.0 SEDIMENT QUALITY

ARI completed analyses on six dredge prism samples and six NSM samples corresponding to each of the three DMMUs at Berths 401 and 410. Table 2 lists the physical results for both berths. Chemical results for Berths 401 and 410 are listed in Tables 3 and 4, respectively, and are compared to SLs to assess the chemical quality of the dredge prism and NSM sediments. This section presents the results and provides an evaluation of them.

4.1 Data Quality Review

A QA review of the data is provided in Appendix B. Method detection limits (MDLs) were reported for all chemical analyses except conventional analyses. The laboratory analyzed QC samples, including surrogates, method blanks, laboratory control samples (LCS), matrix spikes (MS), and laboratory, LCS, and MS duplicates. Upon review, the overall data quality objectives for collection and chemical testing of sediment samples were met, and the data for this project are acceptable for use as qualified. Four QA issues of note are as follows:

- The MS for antimony was well below control limits in sample 401A/DP. Based on our chemist's review of the data, the antimony results for this sample and the other DP samples from Berth 401 was rejected (R-flag). Antimony was not detected in these samples, nor is it a COC at this site based on previous data.
- BEHP was detected in all dredge prism and NSM samples; however, it was also detected in the method blank (19 µg/kg). Where the sample results were less than five times the method blank concentration, the sample concentration was qualified as undetected (U-flag).
- The results for DDE in samples 401C/NSM and 410B/NSM, and for DDD in sample 401B/DP differed by more than 40 percent between the two chromatographic columns (P-flag). The results were also qualified as estimated (J-flag).

- The CCV for DDx associated with the undiluted analysis of sample 410C/NSM was greater than 15 percent. As such, the DDx results on the diluted sample (all non-detect) were reported in Table 4. MDLs for DDE and DDT on the diluted sample exceeded SEF SLs. Although not used, the undiluted sample results were below SEF SLs for both these compounds (8.2 µg/kg JP for DDE and non-detect at 0.18 µg/kg for DDT).

Several undetected and detected results were also J-flagged as estimated for reasons explained in Appendix B. Laboratory reports for chemical analysis, including QC samples, are included in Appendix C.

4.2 Grain Size Characteristics

The grain size results on the dredge prism samples are presented in Table 2, and grain size distribution curves are provided in Appendix C.

Berth 401. The dredge prism at core locations 401A and 401B consists of silty sand or sandy silt (43 to 65 percent fines); these sediments overlie sand in the NSM (less than 13 percent fines). At location 401C, dredge prism and NSM sediments consist of primarily slightly sandy to sandy, clayey silt (over 83 percent fines).

Berth 410. The dredge prism and NSM samples at core location 410A consisted of very silty sand (50 to 51 percent fines). Further into the Slip 3 at locations 410B and 410C, the dredge prism and NSM samples were comprised of a silty sand (22 to 40 percent fines).

4.3 Comparison to SEF Screening Levels

Table 3 presents the chemical results on sediment samples. These results were compared to the SEF SLs. These SLs were established in the SEF for protection of the aquatic environment and to provide a uniform framework for evaluating sediment quality of dredged material for unconfined aquatic disposal. Freshwater SEF SLs have not been finalized, so SLs in Tables 3 and 4 are freshwater Screening Level 1 values from Table 7-1 of the Interim Final SEF (Corps, et al., 2006; table revised October 20, 2006). Pesticides compounds do not have SL1 values so the Corps indicates marine SEF SLs are to be used (Corps, et al. 2009, Table 6-3).

4.3.1 Berth 401

Analytical results for the dredge prism and NSM samples were compared to SEF SLs in Table 3. As indicated below, only two chemicals (TBT and zinc) exceeded SEF SLs in the dredge prism. NSM samples were below SEF SLs.

Dredge Prism Samples. Analytical results on the dredge prism samples only detected two chemical compounds above SEF SLs: TBT at 140 µg/kg (SL of 75 µg/kg) in core location 401A downstream of Berth 401, and zinc at 132 mg/kg (SL of 130 mg/kg) at location 401B, in the upstream mid-section of the berthing area. Other metals, TPH as diesel and oil, PAHs, several SVOCs, DDD, DDE, and PCBs were also detected, but below SEF SLs.

NSM Samples. Chemical analysis of sample 401B/NSM only detected background concentrations of several metals. Results on the other two NSM samples detected metals, TBT, PAHs, several SVOCs, DDD, DDE, and PCBs; however, all detections were below SEF SLs.

4.3.2 Berth 410

Results for the dredge prism and NSM samples were compared to SEF SLs in Table 5. Chemical results show several SEF exceedances (zinc, PAHs, and/or PCBs) in dredge prism and NSM sediments at core location 410C in the eastern portion of the Berth 410. There was a slight exceedance of one PAH in the NSM at location 410B in the middle of the berth.

Dredge Prism Samples. Analytical results on dredge prism samples indicated that the only SEF SL exceedances were four chemical compounds in sample 410C/DP from the eastern portion of the Berth 410. Benzofluoranthenes were above their SEF SL (exceedance ratio of 10); however, zinc, benzo(a)pyrene, and HPAHs were only slightly above their respective SLs (exceedance ratios less than 1.2). Other metals and PAHs, TPH as diesel and oil, TBT, several SVOCs, DDD, DDE, and PCBs were also detected in this sample and the other two dredge samples; however, these detections were below SEF SLs.

NSM Samples. Chemical results did not indicate any SEF SL exceedances for sample 410A/NSM. Only benzofluoranthenes exceeded their SEF SL in sample 410B/NSM (640 µg/kg; SL of 600 µg/kg). In sample 410C/NSM, cadmium, zinc, and benzofluoranthenes had exceedance ratios of near or less than 2, and total PCBs were present at an estimated concentration of 435 µg/kg (exceedance ratio of 7.3). Lead (201 mg/kg) and sulfide (150 mg/kg) were relatively high, but did not exceed SLs. Other metals, TBT, several SVOCs, DDD, and DDE were also detected NSM samples, but below SEF SLs.

4.4 Data Evaluation

Sediment characterization results indicated that several chemical compounds at each berth exceeded SEF SLs. As such, the data for each berth were evaluated

for possible placement options for dredge prism sediments and potential aquatic effects from exposure of the NSM after dredging.

4.4.1 Berth 401

Sediment data from the downstream DMMU, represented by core 401A, indicates that the dredge prism is not suitable for in-water placement due to the presence of TBT above its SL (140 µg/kg versus SL of 75 µg/kg). Overall, chemical concentrations in the DMMU are relatively low and upland placement under a DEQ-approved BUD is likely. Exposure of the NSM at this downstream end would not pose any effects to the aquatic environment (results below SLs; similar to dredge prism sediments).

For the mid-berth DMMU, only zinc in 401B was barely above its SL in dredge prism (exceedance ratio of 1.02). Previous investigations, however, found TBT in the mid-berth area. This area could not be sampled because of a ship in lay berth. In 2006, TBT was detected 1,000 µg/kg in a composite sample of NSM sediments (Anchor, 2006). A subsequent TBT-characterization study determined that TBT was present above its SEF in the mid-berth area to a depth of -44 feet CRD (a sample from -43 to -44 feet CRD had 230 µg/kg TBT; the next deeper sample was non-detect for TBT [Anchor, 2007; Hart Crowser, 2012). Dredging shallower than -44 feet CRD may leave TBT above SEF SLs in the NSM. As such, we recommend that dredging to -44 feet CRD be conducted mid-berth. While TBT and zinc preclude in-water placement of dredged material, the material is likely suitable for upland placement under a BUD.

The upstream DMMU met SEF SLs so dredged material is suitable for both in-water and upland placement. Exposure of the NSM at the upstream end would not pose any effects to the aquatic environment (results below SLs; similar to dredge prism sediments).

4.4.2 Berth 410

Sediment data from the west and mid-berth DMMUs, represented by cores 410A and 410B, indicates that the dredge prism is suitable for both in-water and upland placement. Exposure of the NSM is not anticipated to not pose an adverse effect to the aquatic environment, as results below SEF SLs with the exception of benzofluoranthenes. Benzofluoranthenes were detected in sample 410B/NSM at 640 µg/kg, slightly above the SEF SL of 600 µg/kg (exceedance ratio of 1.07). This result is within the laboratory error: the relative percent difference (RPD) of 6.5 percent between the result and the SL is similar to the RPD of the associated laboratory control sample and its duplicate (6.6 percent). As such, we believe that this minor exceedance does not pose an aquatic concern.

Chemical results from the eastern DMMU of Berth 410 (core location 410C) indicate that the dredge prism sediment is not suitable for in-water placement and, due to high PAH concentrations, may not be approved by the DEQ for upland placement. NSM sediments are lower in PAH concentrations, but have relatively higher lead, zinc, and PCB concentrations. Cadmium, zinc, benzofluoranthenes, and PCBs exceeded SEF SLs in the NSM, but only PCBs were much higher than its SL. As such, exposure of the NSM in the eastern portion of Berth 410 may pose a possible aquatic concern.

5.0 SUMMARY

The Port is proposing to conduct maintenance dredging at Berths 401 and 410 to maintain the navigational depth clearances for vessels docking at these berths. In May 2012, we obtained three sediment cores from each berth. Sediment from each core was sampled to represent the dredge prism and future NSM. Samples were submitted for physical and chemical analyses.

Chemical results from cores completed at Berth 401 indicate that dredge prism sediment from the downstream and mid-berth DMMUs is not suitable for in-water placement, but upland placement under a BUD is likely. Due to previous detections of TBT in the mid-berth area, we recommend dredging to -44 feet CRD in this area. Sediments from the upstream DMMU are suitable for both in-water and upland placement. After dredging, exposure of the NSM does not pose a concern to the aquatic environment.

Data from Berth 410 indicate that western and mid-berth DMMU sediments are suitable for both in-water and upland placement. Exposure of the NSM is unlikely to have an adverse impact on the aquatic environment. The eastern DMMU has relatively high concentrations of PAHs, which would likely preclude in-water or upland placement; as such, this dredged material would require landfill disposal. The NSM in this area also has SEF SL exceedances, and additional post-dredge assessment or actions may be necessary to assess for or mitigate, respectively, impacts to the aquatic environment.

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PSET, 2012. U.S. Army Corps of Engineers (Corps), Portland District, Operations Division, Regulatory Branch (Taylor), Regulatory File No. NWP-2000-984(2) – Technical Memorandum Re: review of the Port of Portland's (Port's) March 7, 2012 Level 2 Sampling and Analysis Plan: Sediment Characterization, Terminal 4 Berths 401 and 410, 11040 North Lombard Street, Portland, Oregon (SAP). Terminal 4 (T4) is located on the east bank of the Willamette River, between river miles (RMs) 4.0 and 5.5, in Portland, Multnomah County, Oregon. April 23, 2012.

U.S. Army Corps of Engineers, Seattle District, Portland District, Walla Walla District, and Northwestern Division; U.S. EPA, Region 10; Washington Departments of Ecology and Natural Resources; Oregon Department of Environmental Quality; Idaho Department of Environmental Quality; National Marine Fisheries Service; and U.S. Fish and Wildlife Service, 2006. *Northwest Region Sediment Evaluation Framework, Interim Final.* September 2006.

U.S. Army Corps of Engineers, Seattle District, Portland District, Walla Walla District, and Northwestern Division; U.S. EPA, Region 10; Washington Departments of Ecology and Natural Resources; Oregon Department of Environmental Quality; Idaho Department of Environmental Quality; National Marine Fisheries Service; and U.S. Fish and Wildlife Service, 2009. *Sediment Evaluation Framework for the Pacific Northwest.* September 2009.

Table 1 - Core and Sample Information
Terminal 4 Sediment Characterization
11040 N. Lombard Street, Portland, Oregon

Core Sample Location	Date	Location			Core Penetration in Feet	Number of Cores Obtained	Percent Sediment Recovery
		Berth	Northing (Latitude)	Easting (Longitude)			
Berth 401							
401A	5/9/12	Downstream	715579	7618374	9.0 - 9.2	2	71 to 75
401B	5/8/12	Mid-Berth to Upstream	714690	7618800	10	2	80 to 82
401C	5/9/12	Upstream	714501	7618778	9.5 - 9.7	2	84 to 87
Berth 410							
410A	5/8/12	West End of Slip	713545	7619337	6.2 - 6.3	2	82 to 85
410B	5/8/12	Mid-Berth	713519	7619551	7.1 - 7.3	2	76 to 85
410C	5/8/12	East End of Berth	713488	7619777	5.6 - 7.3	2	88 to 100
Willamette River Reference Sediment							
Reference (Fine-Grained)	5/9/12	-	652800	7651293	0.5	1 Grab Sample	-

Core Sample Location	Approximate Mudline Elevation*	Dredge Prism		NSM	
		Sample Interval	Individual Sample	Sample Interval	Individual Sample
Berth 401					
401A	-36	-36 to -42	401A/DP	-42 to -44	401A/NSM
401B	-33.5	-33.5 to -42	401B/DP	-42 to -43.5	401B/NSM
401C	-37	-37 to -42	401C/DP	-42 to -44	401C/NSM
Berth 410					
410A	-40.5	-40.5 to -42	410A/DP	-42 to -44	410A/NSM
410B	-40.5	-40.5 to -42	410B/DP	-42 to -44	410B/NSM
410C	-40.5	-40.5 to -42	410C/DP	-42 to -44	410C/NSM
Willamette River Reference Sediment					
Reference (Fine-Grained)	**	-	-	-	Reference

Notes:
1. Northing and easting based on North American Datum of 1983 (NAD 83/98), State Plane Coordinate System, Oregon North Zone.
2. All elevations, depths, and intervals are in feet CRD.
3. - = Not available, not applicable, or not sampled
4. *Based on lead line measurement and river levels from USGS Willamette River gage station 14211720 on Morrison Bridge. Rounded to nearest 0.5 feet. Mudline elevations were within 0.5 foot of the July 2011 bathymetric survey, except for 401B which was 1.5 feet different.
5. **Depth of water to mudline was 14.8 feet.

Table 2 - Grain Size Distributions
Terminal 4 Sediment Characterization
11040 N. Lombard Street, Portland, Oregon

Berth 401

Sediment Horizon		Prism			NSM		
Sample ID		401A/DP	401B/DP	401C/DP	401A/NSM	401B/NSM	401C/NSM
Lab ID		UU16A	UU16B	UU16C	UU16D	UU16E	UU16F
Date		9-May-12	8-May-12	9-May-12	9-May-12	8-May-12	9-May-12
Classification	**Microns**	Percent (%)					
Gravel	>2,000	0.2	0.1	0.0	0.9	0.0	0.1
Very Coarse Sand	850-2000	1.1	1.2	0.3	2.3	1.0	0.2
Coarse Sand	425-850	8.8	17.3	0.3	22.4	34.9	2.2
Medium Sand	250-425	11.6	25.3	0.3	45.3	49.6	3.1
Fine Sand	150-250	4.3	6.7	0.8	14.0	10.3	2.3
Very Fine Sand	75-150	9.1	6.2	7.4	2.9	1.1	9.1
Coarse Silt	32-75	20.9	11.5	30.6	3.7	3.0	27.5
Medium Silt	13-32	16.1	13.6	25.8	2.5	0.0	22.4
Fine Silt	9-13	4.2	3.4	6.5	1.5	0.0	5.4
Very Fine Silt	7-9	6.0	3.4	6.5	1.5	0.0	4.7
8-9 Phi Clay	3.2-7	7.2	6.8	10.8	3.0	0.0	12.2
9-10 Phi Clay	1.3-3.2	4.8	1.7	5.0	0.0	0.0	4.1
> 10 Phi Clay	<1.3	6.0	2.8	5.7	0.0	0.0	6.8
Total Fines	<75	65.2	43.2	90.9	12.2	3.0	83.1
Material Descripti		Clayey, very sandy SILT	Slightly clayey, silty SAND	Slightly sandy, clayey SILT	Slightly silty SAND	SAND	Sandy, clayey SILT

Berth 410

Sediment Horizon		Prism			NSM		
Sample ID		410A/DP	410B/DP	410C/DP	410A/NSM	410B/NSM	410C/NSM
Lab ID		UU16G	UU16H	UU16I	UU16J	UU16K	UU16L
Date		8-May-12	8-May-12	8-May-12	8-May-12	8-May-12	8-May-12
Classification	**Microns**	Percent (%)					
Gravel	>2,000	0.1	0.2	0.3	0.1	0.0	0.2
Very Coarse Sand	850-2000	1.0	0.5	0.4	0.7	0.8	0.5
Coarse Sand	425-850	14.6	17.8	13.3	10.8	21.0	15.1
Medium Sand	250-425	24.5	46.5	37.1	23.3	40.5	33.0
Fine Sand	150-250	5.3	9.8	12.4	7.0	8.4	8.6
Very Fine Sand	75-150	3.8	2.8	4.4	6.9	3.1	3.0
Coarse Silt	32-75	14.6	5.8	7.8	14.8	7.9	8.4
Medium Silt	13-32	15.0	7.1	9.8	15.4	7.8	13.6
Fine Silt	9-13	4.4	1.9	2.9	4.7	1.9	4.0
Very Fine Silt	7-9	4.4	1.9	2.9	4.7	1.9	4.0
8-9 Phi Clay	3.2-7	7.5	3.8	5.8	7.1	4.9	7.4
9-10 Phi Clay	1.3-3.2	3.1	1.9	1.9	3.6	1.0	2.3
> 10 Phi Clay	<1.3	1.9	0.0	1.0	0.0	0.0	0.0
Total Fines	<75	50.9	22.4	32.1	50.3	25.4	39.7
Material Descripti		Clayey, very silty SAND	Slightly clayey, silty SAND	Slightly clayey, silty SAND	Slightly clayey, very silty SAND	Slightly clayey, silty SAND	Slightly clayey, silty SAND

Notes:

1. Sample 410A was run in triplicate as part of laboratory quality control. The result shown shown is the first sample. The other samples were almost the same (total fines of 64.7 and 63.2 percent).
2. Samples were analyzed by ASTM D421/422 which has a slightly different grain scale from the Udden-Wentworth Scale used in the SEF. The SEF classifications listed above are approximately match the micron sizes specified.

Table 3 - Sediment Chemical Analyses Results: Berth 401
Terminal 4 Sediment Characterization
11040 N. Lombard Street, Portland, Oregon

Sediment Horizon	Prism			NSM			SEF Screening Levels
Sample	401A/DP	401B/DP	401C/DP	401A/NSM	401B/NSM	401C/NSM	
Lab ID	UU16A	UU16B	UU16C	UU16D	UU16E	UU16F	
Date	9-May-12	8-May-12	9-May-12	9-May-12	8-May-12	9-May-12	
Conventional Parameters							
Total Solids (%)	**54.0**	**65.4**	**48.7**	**78.9**	**82.5**	**56.5**	-
Total Organic Carbon (%)	**1.70**	**1.49**	**1.80**	**1.36**	**0.116**	**1.68**	-
Ammonia (mg/kg)	**137**	**128**	**4.31**	**28.0**	**16.0**	**293**	-
Total Sulfides (mg/kg)	**10.9**	**9.36**	**1.76**	**33.8**	1.20 U	**5.35**	-
TPH in mg/kg							
Diesel-Range	2.3 U	**21**	**11**	-	-	-	-
Oil-Range	2.8 U	**32**	**32**	-	-	-	-
Total TPH	2.8 U	**53**	**43**	-	-	-	-
Metals in mg/kg							
Antimony	0.024 R	0.019 R	0.027 R	0.016 UJ	0.015 UJ	0.021 UJ	-
Arsenic	**4.1**	**3.7**	**4.6**	**3.3**	**2.4**	**3.7**	20
Cadmium	**0.3**	**0.4**	0.025 U	**0.2**	0.014 U	**0.2**	1.1
Chromium	**27**	**24**	**31**	**16**	**13**	**28**	95
Copper	**39.4**	**31.4**	**47**	**20.5**	**15.2**	**42.0**	80
Lead	**15.6**	**18.5**	**14.1**	**9.5**	**2.4**	**14.2**	340
Mercury	**0.07**	**0.09**	**0.07**	**0.08**	0.03 U	**0.06**	0.28
Nickel	**25.6**	**24.8**	**31**	**20.1**	**18.5**	**27.5**	60
Silver	0.015 U	0.012 U	0.016 U	0.010 U	0.0091 U	0.013 U	2.0
Zinc	**115**	**132**	**111**	**78**	**46**	**98**	130
Tributyltin (TBT)							
TBT in Bulk Sediment (µg/kg)	**140**	**2.4 J**	**5.2**	**17**	0.9 U	**32**	75
PAHs in µg/kg							
LPAHs							
Naphthalene	**130**	**460**	**36**	**190**	2.6 U	**170**	500
Acenaphthylene	**16**	**36**	**8.9**	**26**	5.4 U	**28**	470
Acenaphthene	**49**	**180**	**12**	**54**	3.1 U	**99**	1,100
Fluorene	**30**	**87**	**11**	**47**	4.1 U	**84**	1,000
Phenanthrene	**190**	**460**	**86**	**390**	3.4 U	**340**	6,100
Anthracene	**42**	**82**	**29**	**70**	4.3 U	**62**	1,200
2-Methylnaphthalene	**40**	**160**	**11**	**71**	2.9 U	**44**	470
Total LPAHs	**497**	**1,465**	**194**	**848**	5.4 U	**827**	6,600
HPAHs							
Fluoranthene	**320**	**480**	**230**	**400**	2.8 U	**310**	11,000
Pyrene	**280**	**490**	**210**	**510**	1.8 U	**300**	8,800
Benz(a)anthracene	**75**	**150**	**91**	**140**	3.1 U	**140**	4,300
Chrysene	**130**	**210**	**140**	**190**	3.6 U	**160**	5,900
Benzo(b)fluoranthene	**-**	**-**	**-**	**-**	-	-	-
Benzo(k)fluoranthene	**-**	**-**	**-**	**-**	-	-	-
Benzo(b+k)fluoranthenes	**190**	**230**	**250**	**250**	2.6 U	**300**	600
Benzo(a)pyrene	**140**	**180**	**130**	**200**	5.2 U	**210**	3,300
Indeno(1,2,3-cd)pyrene	**80**	**100**	**67**	**110**	4.4 U	**100**	4,100
Dibenz(a,h)anthracene	**20**	**26**	**21**	**26**	4.1 U	**30**	800
Benzo(g,h,i)perylene	**110**	**140**	**78**	**150**	4.1 U	**120**	4,000
Total HPAHs	**1,345**	**2,006**	**1,217**	**1,976**	5.2 U	**1,670**	31,000
SVOCs in µg/kg							
Chlorinated Hydrocarbons							
1,4-Dichlorobenzene	2.7 U	2.7 U	2.7 U	2.6 U	2.7 U	2.7 U	-
1,2-Dichlorobenzene	2.3 U	2.3 U	2.3 U	2.3 U	2.4 U	2.4 U	-
1,2,4-Trichlorobenzene	3.3 U	3.2 U	3.2 U	3.2 U	3.3 U	3.3 U	-
Hexachlorobenzene	4.0 U	4.0 U	4.0 U	3.9 U	4.1 U	4.1 U	-

Please refer to notes on the last page of this table.

Table 3 - Sediment Chemical Analyses Results: Berth 401
Terminal 4 Sediment Characterization
11040 N. Lombard Street, Portland, Oregon

Sediment Horizon	Prism			NSM			SEF Screening Levels
Sample	401A/DP	401B/DP	401C/DP	401A/NSM	401B/NSM	401C/NSM	
Lab ID	UU16	UU16	UU16	UU16	UU16	UU16	
Date	9-May-12	8-May-12	9-May-12	9-May-12	8-May-12	9-May-12	
SVOCs in µg/kg (Continued)							
Phthalates							
Dimethyl Phthalate	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.8 U	46
Diethyl Phthalate	34 U	34 U	34 U	33 U	35 U	35 U	-
Di-n-butyl Phthalate	7.7 U	7.6 U	7.6 U	7.5 U	7.7 U	7.7 U	-
Butyl Benzyl Phthalate	5.8 U	5.7 U	**17 J**	5.6 U	5.8 U	5.8 U	260
Bis (2-ethylhexyl) Phthalate	84 U	50 U	**110**	47 U	33 U	68 U	220
Di-n-octyl Phthalate	5.5 U	5.4 U	5.4 U	5.3 U	5.5 U	5.5 U	26
Phenols							
2,4-Dimethylphenol	3.2 U	3.2 U	3.2 U	3.2 U	3.3 U	3.3 U	-
2-Methylphenol	4.9 U	4.9 U	4.9 U	4.8 U	5.0 U	5.0 U	-
4-Methylphenol	**39**	**130**	**37**	**67**	6.3 U	**110**	-
Pentachlorophenol	46 UJ	45 UJ	45 UJ	44 UJ	46 UJ	46 UJ	-
Phenol	**18 J**	8.0 U	8.0 U	7.9 U	8.2 U	**43**	-
Miscellaneous Extractables							
Benzoic Acid	95 U	94 U	**190 J**	92 U	96 U	**330 J**	-
Benzyl Alcohol	**39**	**25**	**98**	5.6 U	5.8 U	**190**	-
Dibenzofuran	**19**	**54**	**53**	**23**	3.9 U	**31**	400
Hexachlorobutadiene	4.3 U	4.2 U	4.3 U	4.2 U	4.3 U	4.3 U	-
n -Nitrosodiphenylamine	5.1 U	5.0 U	5.0 U	4.9 U	5.1 U	5.1 U	-
Pesticides in µg/kg							
4,4'-DDD	**2.2**	**3.3**	**1.1**	**1.4**	0.13 U	**2.5**	16[a]
4,4'-DDE	**3.6**	**4.1**	**2.2**	**2.1**	0.12 U	**5.5 JP**	9[a]
4,4'-DDT	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U	12[a]
Aldrin	0.054 U	0.053 U	0.053 U	0.053 U	0.053 U	0.054 U	9.5[a]
alpha -Chlordane	0.050 U	0.049 U	0.049 U	0.049 U	0.049 U	0.050 U	2.8[a]
Dieldrin	0.098 U	0.096 U	0.097 U	0.096 U	0.096 U	0.097 U	1.9[a]
Heptachlor	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	0.13 U	1.5[a]
gamma -BHC (Lindane)	0.047 U	0.046 U	0.046 U	0.046 U	0.046 U	0.047 U	10[b]
PCBs in µg/kg							
Aroclor 1016	1.0 U	0.97 U	0.99 U	0.99 U	0.97 U	1.0 U	-
Aroclor 1221	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	-
Aroclor 1232	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	-
Aroclor 1242	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	-
Aroclor 1248	**12 JP**	19 U	5.8 U	**7.9**	1.3 U	6.8 U	-
Aroclor 1254	12 U	19 U	5.8 U	9.7 U	1.3 U	9.8 U	-
Aroclor 1260	**10**	**16**	**5.5**	**9.1**	1.3 U	**6.6**	-
Aroclor 1262	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	-
Aroclor 1268	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	-
Total PCBs	**22 J**	**16 J**	**5.5 J**	**17**	1.3 U	**6.6 J**	60

Notes:

1. Screening levels (SLs) are Freshwater Screening Levels 1 (no adverse effects) from the Sediment Evaluation Framework (SEF) (Corps, et al., 2006; Table 7-1, revised 10/20/06). For pesticides, no freshwater SLs have been established and the Corp uses marine SLs from corrected Table 6-3 of the Final SEF (Corps, et al., 2009). These marine SLs are listed and flagged with an [a].
2. PAH and dibenzofuran concentrations are the higher of the lowest acceptable dilution of the EPA Method 8270D-SIM and EPA Method 8270D analyses.
3. Bolded values are detected concentrations.
4. For undetected compounds, method detections limits (MDLs) are shown.
5. - = Not analyzed or not available.
6. J = Estimated concentration. Result may be estimated due to value between MDL and method reporting limit (MRL), or due to QA exceedance.
7. U = Not detected at the indicated MDL.
8. P = The analyte was detected on both chromatographic columns but the RPD was greater than 40%.
9. Reference sample results: 51.7% solids, 29.9 mg/kg ammonia, and 2.51 mg/kg total sulfides.

Table 4 - Sediment Chemical Analyses Results: Berth 410
Terminal 4 Sediment Characterization
11040 N. Lombard Street, Portland, Oregon

Sediment Horizon	Prism			NSM			SEF Screening Levels
Sample	410A/DP	410B/DP	410C/DP	410A/NSM	410B/NSM	410C/NSM	
Lab ID	UU16G	UU16H	UU16I	UU16J	UU16K	UU16L	
Date	8-May-12	8-May-12	8-May-12	8-May-12	8-May-12	8-May-12	
Conventional Parameters							
Total Solids (%)	**55.3**	**71.1**	**65.5**	**60.6**	**72.7**	**69.4**	-
Total Organic Carbon (%)	**1.84**	**1.18**	**1.86**	**1.84**	**1.19**	**1.39**	-
Ammonia (mg/kg)	**105**	**81.9**	**85.8**	**152**	**96.2**	**140**	-
Total Sulfides (mg/kg)	**28.6**	**18.3**	**94.2**	**22.4**	**32.9**	**150**	-
TPH in mg/kg							
Diesel-Range	**10**	1.3 U	**20**	-	-	-	-
Oil-Range	**150**	2.7 U	**33**	-	-	-	-
Total TPH	**160**	2.7 U	**53**	-	-	-	-
Metals in mg/kg							
Antimony	0.023 UJ	0.018 UJ	0.020 UJ	0.021 UJ	0.018 UJ	0.017 UJ	-
Arsenic	**3.6**	**2.9**	**3.8**	**3.4**	**3.0**	**5.2**	20
Cadmium	0.021 U	0.017 U	**0.6**	0.020 U	**0.1**	**1.4**	1.1
Chromium	**22**	**16**	**18**	**22**	**18**	**21**	95
Copper	**31.7**	**24.5**	**35.9**	**31.4**	**26.8**	**43.5**	80
Lead	**9.5**	**8.3**	**53.7**	**13.7**	**19.1**	**201**	340
Mercury	0.0018 U	**0.03**	**0.05**	**0.07**	0.0018 U	**0.06**	0.28
Nickel	**23.7**	**19.8**	**22.7**	**24.5**	**20.0**	**23.2**	60
Silver	0.014 U	0.011 U	0.012 U	0.013 U	0.011 U	**0.5**	2.0
Zinc	**85**	**67**	**146**	**93**	**79**	**265**	130
Tributyltin (TBT)							
TBT in Bulk Sediment (µg/kg)	1.0 U	**1.9 J**	**10**	**2.9 J**	**14**	**18**	75
PAHs in µg/kg							
LPAHs							
Naphthalene	**34**	**37**	**140**	**510**	**47**	**150**	500
Acenaphthylene	**7.1**	**4.1 J**	**42**	**29**	**9.3 J**	**36**	470
Acenaphthene	**49**	**38**	**270**	**460**	**83**	**190**	1,100
Fluorene	**27**	**28**	**160**	**120**	**40**	**120**	1,000
Phenanthrene	**100**	**130**	**1,600**	**1,000**	**270**	**940**	6,100
Anthracene	**23**	**36**	**320**	**100**	**60**	**160**	1,200
2-Methylnaphthalene	**12**	**20**	**67**	**210**	**21**	**88**	470
Total LPAHs	**252**	**293**	**2,599**	**2,429**	**530**	**1,684**	6,600
HPAHs							
Fluoranthene	**160**	**170**	**5,900**	**600**	**500**	**1,400**	11,000
Pyrene	**160**	**170**	**5,000**	**580**	**450**	**1,200**	8,800
Benz(a)anthracene	**57**	**66**	**3,200**	**160**	**280**	**560**	4,300
Chrysene	**83**	**84**	**3,800**	**190**	**320**	**760**	5,900
Benzo(b)fluoranthene	**-**	**-**	**-**	**-**	**-**	**-**	-
Benzo(k)fluoranthene	**-**	**-**	**-**	**-**	**-**	**-**	-
Benzo(b+k)fluoranthenes	**130**	**130**	**6,200**	**260**	**640**	**1,300**	600
Benzo(a)pyrene	**86**	**83**	**3,900**	**170**	**400**	**720**	3,300
Indeno(1,2,3-cd)pyrene	**50**	**41**	**1,500**	**65**	**160**	**260**	4,100
Dibenz(a,h)anthracene	**12**	**8.4**	**600**	**19**	**58**	**110**	800
Benzo(g,h,i)perylene	**62**	**44**	**1,400**	**74**	**160**	**250**	4,000
Total HPAHs	**800**	**796**	**31,500**	**2,118**	**2,968**	**6,560**	31,000
SVOCs in µg/kg							
Chlorinated Hydrocarbons							
1,4-Dichlorobenzene	2.7 U	2.8 U	2.6 U	2.7 U	2.7 U	2.8 U	-
1,2-Dichlorobenzene	2.4 U	2.4 U	2.3 U	2.4 U	2.3 U	2.4 U	-
1,2,4-Trichlorobenzene	3.3 U	3.4 U	3.2 U	3.3 U	3.2 U	3.4 U	-
Hexachlorobenzene	4.0 U	4.4 U	3.9 U	4.1 U	4.2 U	4.1 U	-

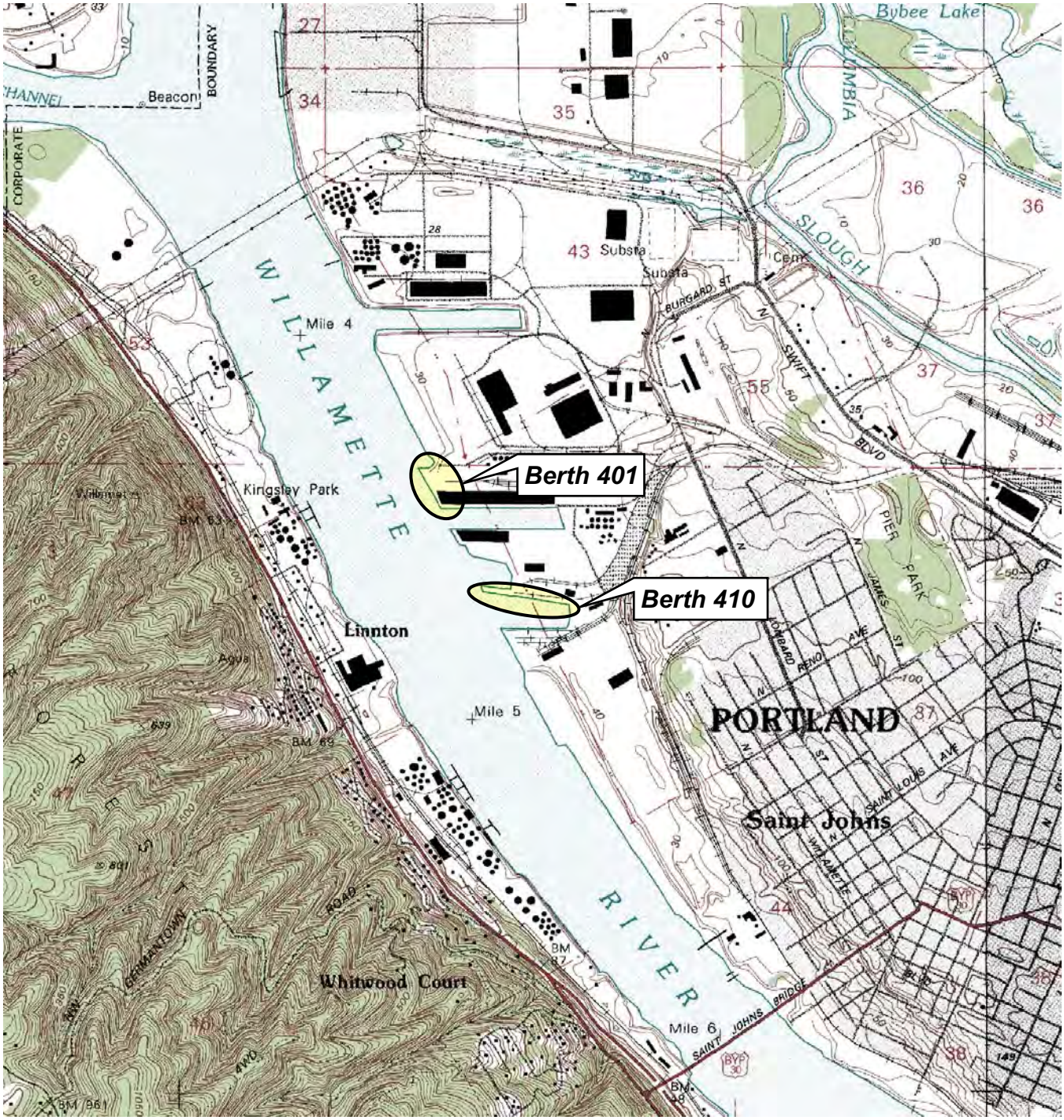
Please refer to notes on the last page of this table.

Table 4 - Sediment Chemical Analyses Results: Berth 410
Terminal 4 Sediment Characterization
11040 N. Lombard Street, Portland, Oregon

Sediment Horizon	Prism			NSM			SEF Screening Levels
Sample	410A/DP	410B/DP	410C/DP	410A/NSM	410B/NSM	410C/NSM	
Lab ID	UU16	UU16	UU16	UU16	UU16	UU16	
Date	8-May-12	8-May-12	8-May-12	8-May-12	8-May-12	8-May-12	
SVOCs in µg/kg (Continued)							
Phthalates							
Dimethyl Phthalate	2.8 U	2.8 U	2.7 U	2.8 U	2.7 U	2.8 U	46
Diethyl Phthalate	35 U	36 U	34 U	35 U	34 U	35 U	-
Di-n-butyl Phthalate	7.7 U	7.9 U	7.5 U	7.8 U	7.6 U	7.9 U	-
Butyl Benzyl Phthalate	5.8 U	6.0 U	5.6 U	5.9 U	5.7 U	5.9 U	260
Bis (2-ethylhexyl) Phthalate	62 U	68 U	86 U	65 U	44 U	**110**	220
Di-n-octyl Phthalate	5.6 U	5.7 U	**12 J**	5.6 U	5.4 U	5.6 U	26
Phenols							
2,4-Dimethylphenol	3.3 U	3.4 U	3.2 U	3.3 U	3.2 U	3.3 U	-
2-Methylphenol	5 U	5.1 U	4.8 U	5.0 U	4.9 U	5.1 U	-
4-Methylphenol	**14 J**	6.5 U	**26 J**	**110**	**9.3 J**	**34 J**	-
Pentachlorophenol	46 UJ	47 UJ	44 UJ	46 UJ	45 UJ	47 UJ	-
Phenol	**30 J**	**11 J**	**20 J**	**24 J**	8.0 U	**28 J**	-
Miscellaneous Extractables							
Benzoic Acid	**110 J**	98 U	93 U	**120 J**	94 U	97 U	-
Benzyl Alcohol	**73**	**20**	**25**	**68**	5.6 U	**12 J**	-
Dibenzofuran	**14**	**17**	**61**	**94**	**18 J**	**62**	400
Hexachlorobutadiene	4.4 U	4.4 U	4.2 U	4.4 U	4.2 U	4.4 U	-
n -Nitrosodiphenylamine	5.1 U	5.2 U	4.9 U	5.2 U	5.0 U	**30**	-
Pesticides in µg/kg							
4,4'-DDD	**0.92 J**	**1.1 JP**	**2.2**	**3.6**	**1.3**	9.6* U	16[a]
4,4'-DDE	**1.7**	**0.96 J**	**2.3**	**3.3**	**2.5 JP**	12* U	9[a]
4,4'-DDT	0.19 U	0.18 U	0.19 U	0.19 U	0.19 U	18* U	12[a]
Aldrin	0.053 U	0.052 U	0.054 U	0.054 U	0.054 U	0.053 U	9.5[a]
alpha -Chlordane	0.049 U	0.048 U	0.050 U	0.050 U	0.050 U	0.049 U	2.8[a]
Dieldrin	0.097 U	0.095 U	0.098 U	0.099 U	0.098 U	0.096 U	1.9[a]
Heptachlor	0.13 U	0.12 U	0.13 U	0.13 U	0.13 U	0.13 U	1.5[a]
gamma -BHC (Lindane)	0.046 U	0.015 U	0.047 U	0.047 U	0.047 U	0.016 U	10[b]
PCBs in µg/kg							
Aroclor 1016	0.99 U	0.96 U	1.0 U	1.0 U	0.99 U	9.8 UJ	-
Aroclor 1221	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	13 UJ	-
Aroclor 1232	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	13 UJ	-
Aroclor 1242	9.7 U	5.6 U	1.3 U	1.3 U	1.3 U	13 UJ	-
Aroclor 1248	1.3 U	1.3 U	20 U	9.9 U	5.8 U	**160 JP**	-
Aroclor 1254	5.8 U	1.3 U	20 U	9.9 U	5.8 U	**180 J**	-
Aroclor 1260	**5.7**	**3.8**	**16**	**9.3**	**4.9**	**95 J**	-
Aroclor 1262	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	13 UJ	-
Aroclor 1268	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	13 UJ	-
Total PCBs	**5.7 J**	**3.8 J**	**16 J**	**9.3 J**	**4.9 J**	**435 J**	60

Notes:

1. Screening levels (SLs) are Freshwater Screening Levels 1 (no adverse effects) from the Sediment Evaluation Framework (SEF) (Corps, et al., 2006; Table 7-1, revised 10/20/06). For pesticides, no freshwater SLs have been established and the Corp uses marine SLs from corrected Table 6-3 of the Final SEF (Corps, et al., 2009). These marine SLs are listed and flagged with an [a].
2. PAH and dibenzofuran concentrations are the higher of the lowest acceptable dilution of the EPA Method 8270D-SIM and EPA Method 8270D analyses.
3. Bolded values are detected concentrations.
4. For undetected compounds, method detections limits (MDLs) are shown.
5. - = Not analyzed or not available.
6. J = Estimated concentration. Result may be estimated due to value between MDL and method reporting limit (MRL), or due to QA exceedance.
7. U = Not detected at the indicated MDL.
8. P = The analyte was detected on both chromatographic columns but the RPD was greater than 40%.
9. Reference sample results: 51.7% solids, 29.9 mg/kg ammonia, and 2.51 mg/kg total sulfides.
10. *Results on diluted sample that had acceptable quality control. The undiluted sample, which had a calibration sample failure on the run, had 5.2 µg/kg DDD, 8.2 µg/kg JP DDE, and undetected DDT at 0.18 µg/kg.



N

0 2,000 4,000

Scale in Feet

Terminal 4 Sediment Characterization SAP
Portland, Oregon

Site Location Map

15753-00 5/12

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Figure
1

Source: Base map prepared from the USGS 7.5-minute quadrangle of Linnton, Oregon, dated 1990.

F:\Data\Jobs\Port of Portland\15753 T4 Maint\SCR\Figures - SCR\157530004-001 (Site Location)-SCR.cdr

Berth 401

Anticipated Dredge Area
Based on 2011 Bathymetry

401A

401B

401C

Berthing Area

Willamette River

401A Core Sampling Location and Number

-40 Contours Based on a 2011 Bathymetric Survey in Feet (CRD)

Yellow Shading Represents Building

0 100 200
Scale in Feet

N

Source: Port of Portland T4 Maintenance Dredging Berth 401 Plan, dated 12/1/11.

Terminal 4 Sediment Characterization SAP
Portland, Oregon

Berth 401 and Core Locations

15753-00 5/12

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Figure
2

JAB 05/25/12 F:\Data\Jobs\Port of Portland\15753 T4 Maint\SCR\Figures - SCR\157530004-002-003 (Site Plans)-SCR.dwg

Berth 410

Berth 411

410A

410B

410C

Anticipated Dredge Area
Based on 2011 Bathymetry

Berthing Area for Berths 410 & 411

Slip 3

Willamette River

Berth 412

410A Core Sampling Location and Number

-40 Contours Based on a 2011 Bathymetric Survey in Feet (CRD)

Yellow Shading Represents Building

0 100 200
Scale in Feet

N

Source: Port of Portland T4 Maintenance Dredging Berth 401 Plan, dated 12/1/11.

JAB 05/22/12 F:\Data\Jobs\Port of Portland\15753 T4 Maint\SCR\Figures - SCR\157530004-002-003 (Site Plans)-SCR.dwg

Terminal 4 Sediment Characterization SAP
Portland, Oregon

Berth 410 and Core Locations

15753-00 5/12

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Figure
3

APPENDIX A
SEDIMENT CORE LOGS

Key to Exploration Logs

Sample Description

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits and probes is estimated based on visual observation and is presented parenthetically on the logs.

SAND or GRAVEL Density	Standard Penetration Resistance (N) in Blows/Foot	SILT or CLAY Consistency	Standard Penetration Resistance (N) in Blows/Foot
Very loose	0 to 4	Very soft	0 to 2
Loose	4 to 10	Soft	2 to 4
Medium dense	10 to 30	Medium stiff	4 to 8
Dense	30 to 50	Stiff	8 to 15
Very dense	>50	Very stiff	15 to 30
		Hard	>30

Moisture

Dry	Little perceptible moisture
Damp	Some perceptible moisture, likely below optimum
Moist	Likely near optimum moisture content
Wet	Much perceptible moisture, likely above optimum

Minor Constituents	Estimated Percentage
Trace	<5
Slightly (clayey, silty, etc.)	5 - 12
Clayey, silty, sandy, gravelly	12 - 30
Very (clayey, silty, etc.)	30 - 50

Sampling Test Symbols

Split Spoon | Cuttings | Core Run

Push Probe | Grab (Jar)

Test Symbols

NA	Not Available
NS	No Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen
PID	Photoionization Detector Reading

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE)	GRAVEL AND GRAVELLY SOILS (MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE)	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS (MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE)	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE)	SILTS AND CLAYS (LIQUID LIMIT LESS THAN 50)			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (LIQUID LIMIT GREATER THAN 50)			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

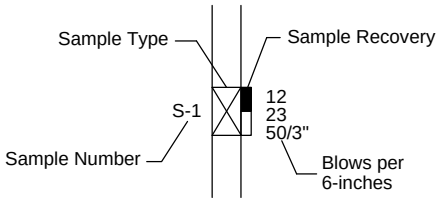
NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

Groundwater Indicators

Groundwater Level on Date or (ATD) At Time of Drilling

Groundwater Seepage (Test Pits)

Sample Key



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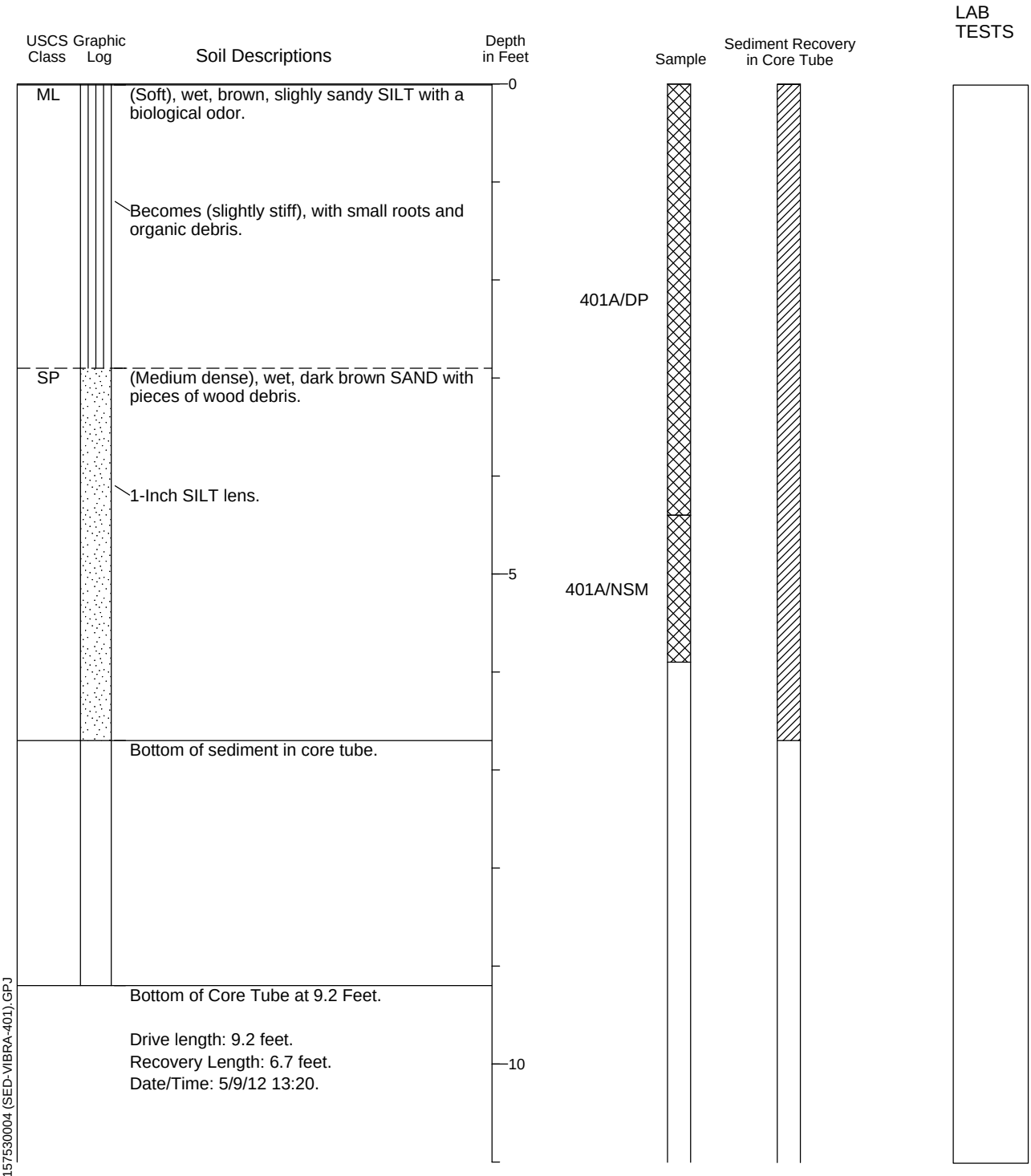
15753-00 *6/12*

Figure A-1

Vibracore Log 401A

Location: Terminal 4, Berth 401
Mudline Elevation: -36 Feet CRD
Water Depth in Feet: 47.2

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 715578.743
Easting: 7618374.091
Logged By: J. Miles Reviewed By: R. Ernst



157530004 (SED-VIBRA-401).GPJ

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Sample interval based on interpretation of core recovery and geological observations.
5. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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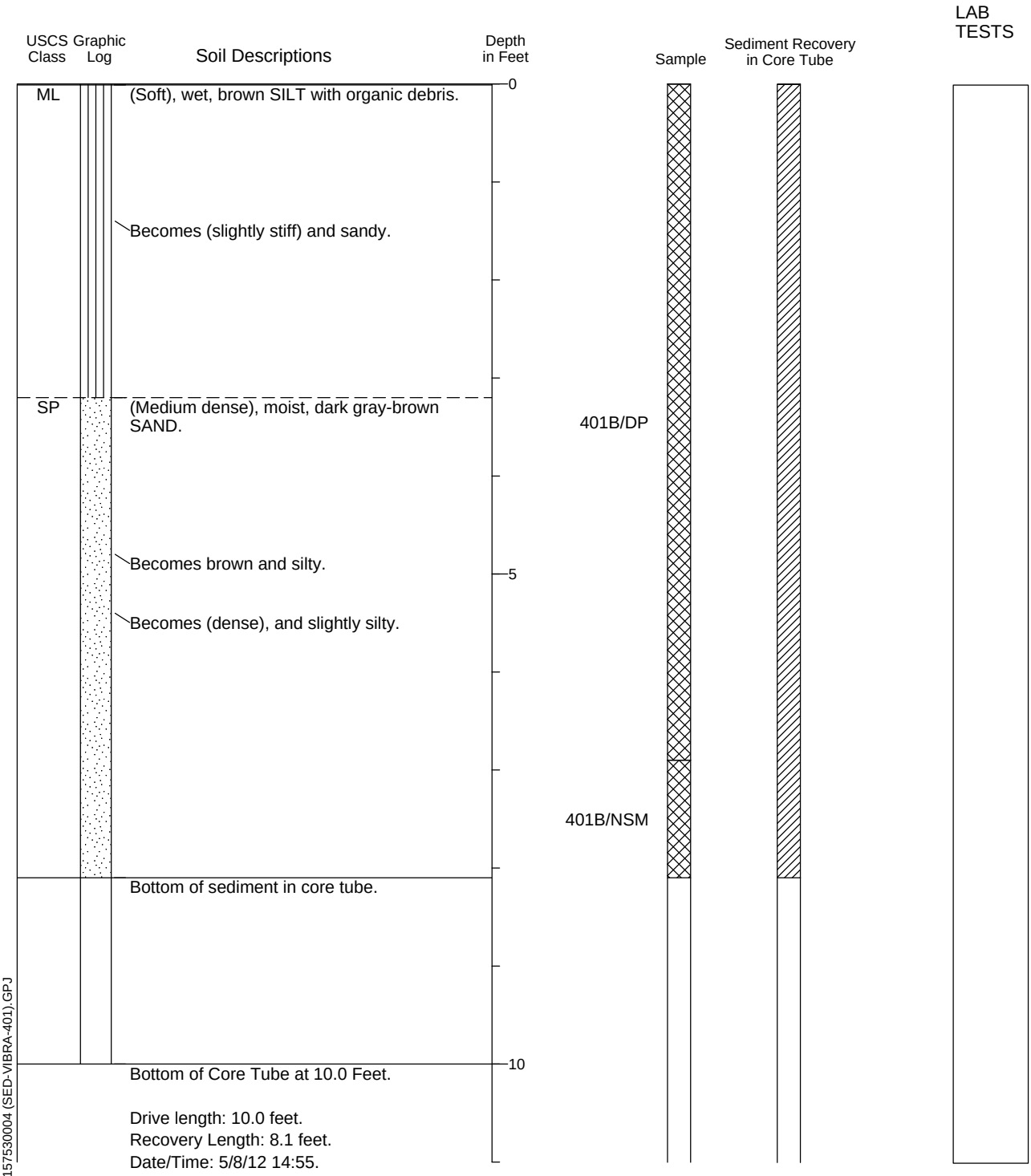
15753-00 ***6/12***

Figure A-2

Vibracore Log 401B (Alt)

Location: Terminal 4, Berth 401
Mudline Elevation: -33.5 Feet CRD
Water Depth in Feet: 45.6

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 714689.667
Easting: 7618799.995
Logged By: J. Miles Reviewed By: R. Ernst



157530004 (SED-VIBRA-401).GPJ

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Sample interval based on interpretation of core recovery and geological observations.
5. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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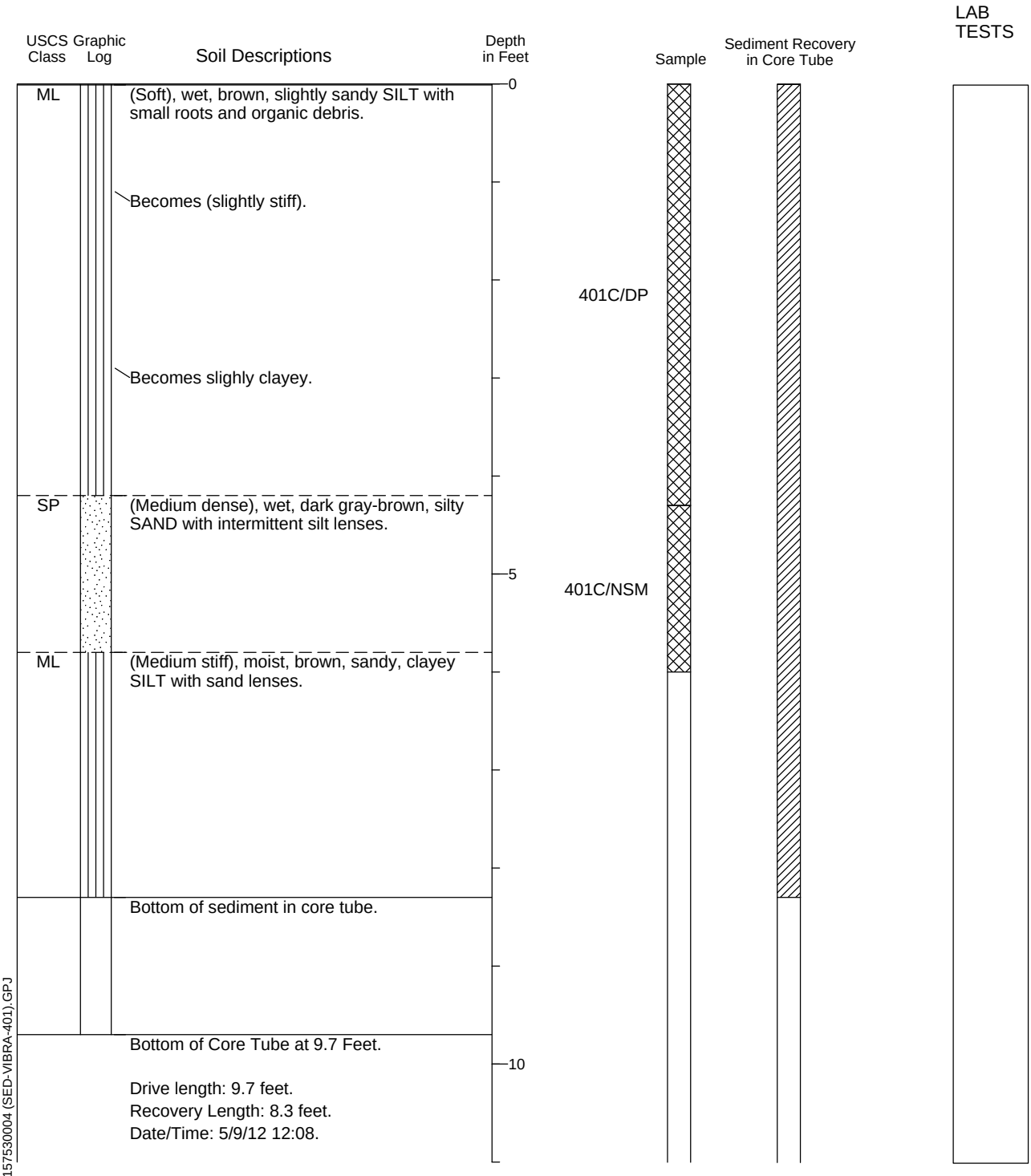
15753-00 ***6/12***

Figure A-3

Vibracore Log 401C

Location: Terminal 4, Berth 401
Mudline Elevation: -37 Feet CRD
Water Depth in Feet: 48.8

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 714501.226
Easting: 7618778.835
Logged By: J. Miles Reviewed By: R. Ernst



157530004 (SED-VIBRA-401).GPJ

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Sample interval based on interpretation of core recovery and geological observations.
5. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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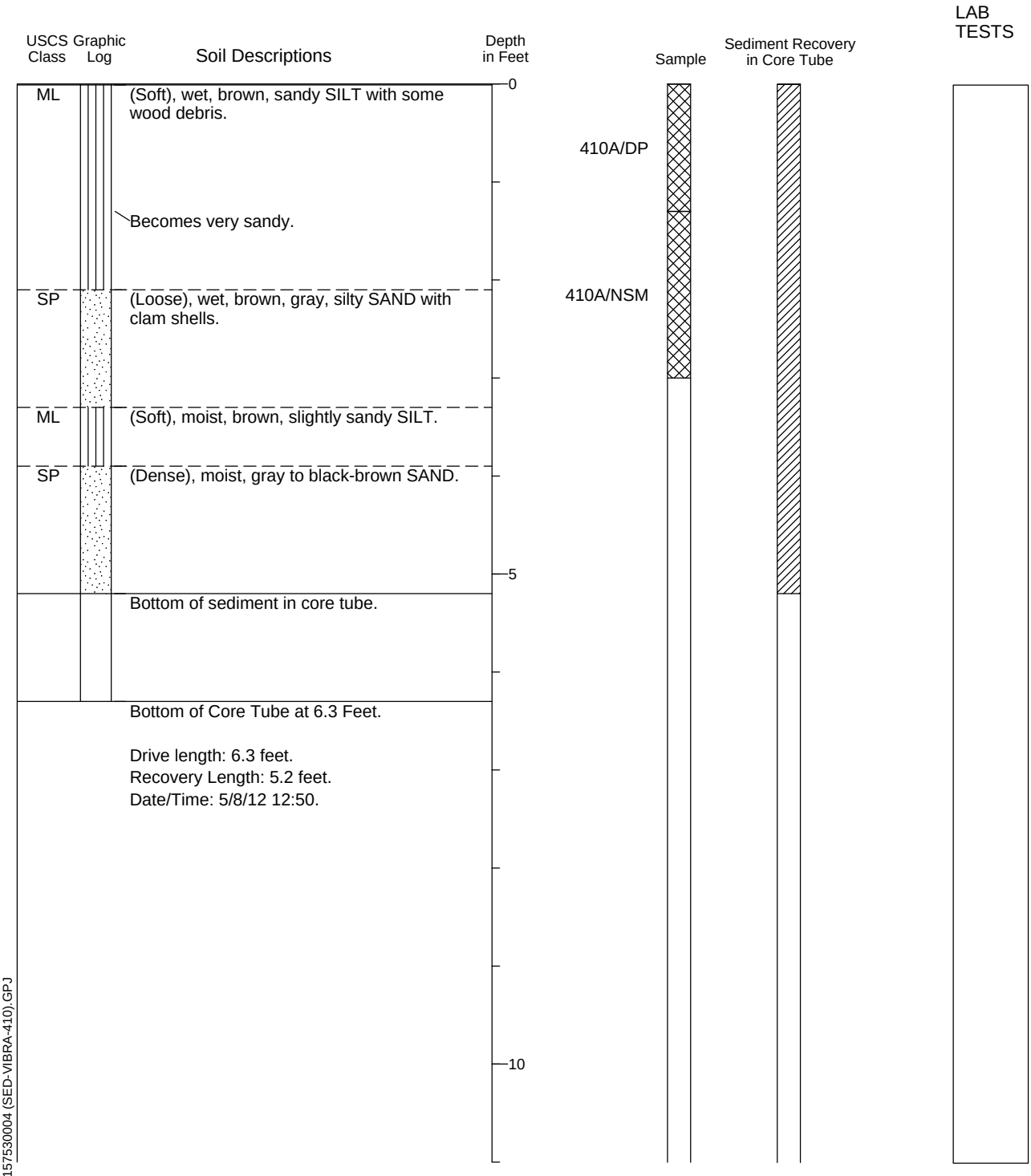
15753-00 ***6/12***

Figure A-4

Vibracore Log 410A

Location: Terminal 4, Berth 410
Mudline Elevation: -40.5 Feet CRD
Water Depth in Feet: 53.2

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 713545.166
Easting: 7619336.653
Logged By: J. Miles Reviewed By: R. Ernst



157530004 (SED-VIBRA-410).GPJ

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Sample interval based on interpretation of core recovery and geological observations.
5. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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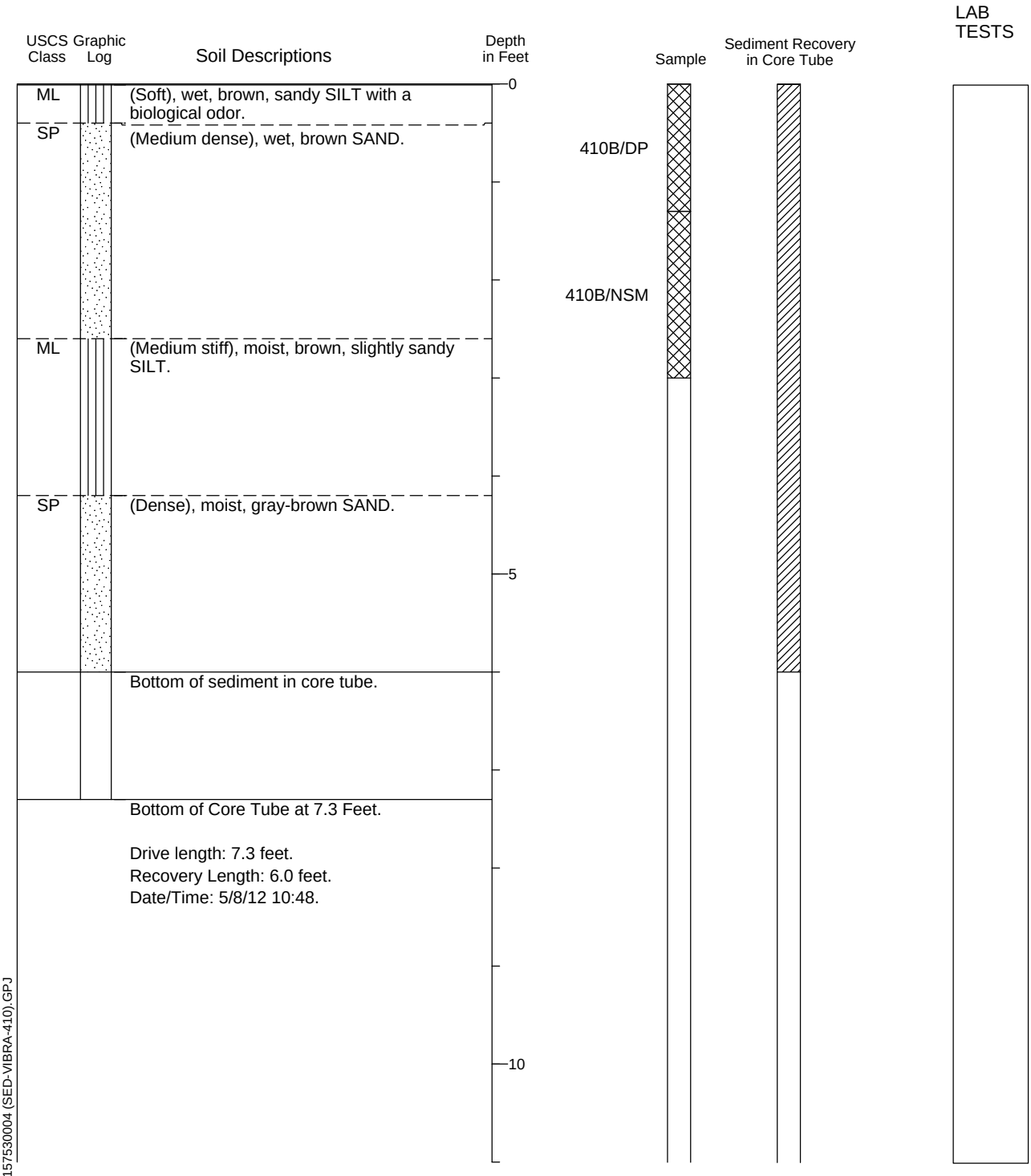
15753-00 ***6/12***

Figure A-5

Vibracore Log 410B

Location: Terminal 4, Berth 410
Mudline Elevation: -40.5 Feet CRD
Water Depth in Feet: 53.2

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 713519.278
Easting: 7619551.251
Logged By: J. Miles Reviewed By: R. Ernst



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Sample interval based on interpretation of core recovery and geological observations.
5. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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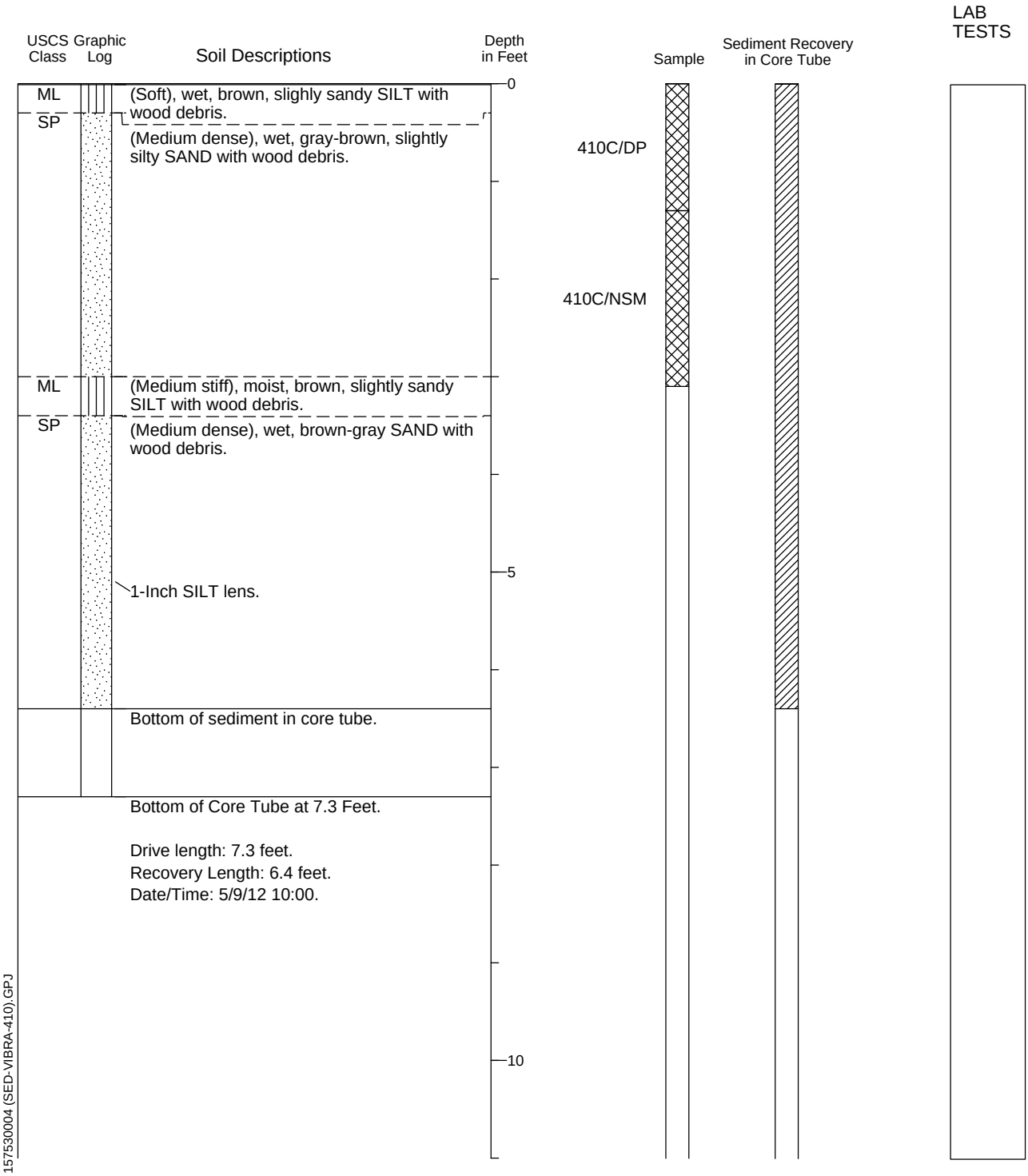
15753-00 ***6/12***

Figure A-6

Vibracore Log 410C

Location: Terminal 4, Berth 410
Mudline Elevation: -40.5 Feet CRD
Water Depth in Feet: 53.5

Type of Sample: Vibracore
Core Diameter: 4 inches
Northing: 713488.399
Easting: 7619777.139
Logged By: J. Miles Reviewed By: R. Ernst



1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Sample interval based on interpretation of core recovery and geological observations.
5. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

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15753-00 ***6/12***

Figure A-7

APPENDIX B
QUALITY ASSURANCE REVIEW

APPENDIX B
QUALITY ASSURANCE REVIEW

This appendix documents the results of a quality assurance (QA) review of the analytical data for dredge prism and new surface material (NSM) samples collected during the May 2012 sediment characterization at the Berths 401 and 410. Field procedures used for sample collection are discussed in our Sampling and Analysis Plan (SAP; Hart Crowser, 2011). Hart Crowser submitted sediment samples to Analytical Resources, Inc. (ARI), of Tukwila, Washington, for chemical analysis. A copy of the analytical laboratory report (ARI Job No. UU16) is included in Appendix C. Upon review, the analytical data are valid with minor qualifications for their intended use. A Data Completeness (QA1) checklist is included as Table B-1 in this appendix.

The quality assurance review included examination and validation of the laboratory's summary reports, including:

- Holding times;
- Method blanks;
- Surrogate recoveries;
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) recoveries;
- Standard reference material (SRM) recoveries;
- Matrix spike and matrix spike duplicate (MS/MSD) recoveries;
- Calibration criteria;
- Internal Standard (IS) recoveries, where applicable;
- Laboratory duplicate relative percent difference (RPD), where applicable; and
- Laboratory replicate relative standard deviation (RSD), where applicable.

A Level IV Data Deliverables Package was available for review.

ANALYTICAL METHODS AND DETECTION LIMITS

Chemical Analyses on Sediment

Six cores were obtained during the sediment characterization fieldwork on May 8 and 9, 2012, with three cores from Berth 401 and three cores from

Berth 410. Each core was divided into two sections to represent the dredge prism and the NSM interval, for a total of twelve sediment samples. A reference sample was collected on May 9, 2012, and submitted with the core samples. The sediment samples were analyzed for one or more of the following:

- Total solids by EPA Method 160.3 modified;
- Total organic carbon (TOC) by Plumb (1981);
- Ammonia by EPA Method 350.1 modified;
- Sulfide by EPA Method 376.2;
- Total metals (antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc) by EPA Methods 200.8/7471A;
- Total petroleum hydrocarbons as diesel and oil by Northwest Method NWTPH-Dx with silica gel and acid cleanup;
- Tributyltin (TBT) by Krone, et al. (written 1988; published 1989);
- Polycyclic aromatic hydrocarbon (PAHs) by EPA Method 8270D-SIM;
- Semivolatile organic compounds (SVOCs) by EPA Method 8270D;
- Organochlorine pesticides by EPA Method 8081A;
- Polychlorinated biphenyls (PCBs) by EPA Method 8082; and
- Grain size by ASTM D421/D422.

These analytical test methods were the analytical methods specified in the SAP (Hart Crowser, 2012) or in the case of metals (except mercury) is an equivalent method.

Detection and Reporting Limits

Method detection limits (MDLs) are the minimum concentration of a chemical compound that can be measured and reported that the compound is present, and is based on instrumentation abilities and sample matrix. Method reporting limits (MRLs) are set by the laboratory and are based on the low standard of the initial calibration curve or low-level calibration check standard, and represent the concentration that can be accurately quantified. In some cases, the MRL is raised due to high concentrations of analytes in the samples or matrix interferences. MRLs were consistent with industry standards. Tables 3 and 4 of this report list the MDLs for undetected values. The MDLs are sufficient in achieving the SEF SLs listed in Tables 3 and 4. Analytical results that fell between the MDL and MRL are qualified as estimated (J).

QA REVIEW RESULTS

The laboratory provided QC sample results, which were underwent a QA review. Laboratory QC samples were consistent with those specified in the SAP (Hart Crowser, 2012) to evaluate precision, accuracy, representativeness, comparability, and completeness. Upon review, the sample data and laboratory QC data were found to be suitable for their intended use with minor qualifications. The following summarizes, by analyte or test, the results of our QA review of the analytical data.

Total Solids. All required holding times were met. No method blank contamination was detected. The laboratory replicate RSD was acceptable.

TOC. All required holding times were met. No method blank contamination was detected. LCS, MS, and SRM recoveries were within control limits. The laboratory replicate RSD was acceptable.

Ammonia. All required holding times were met. No method blank contamination was detected. SRM and MS recoveries were within control limits. The laboratory replicate RSD was acceptable.

Sulfide. All required holding times were met. No method blank contamination was detected. The LCS and MS recovery were within laboratory control limits. The laboratory duplicate RPD was within 30 percent.

Total Metals. All required holding times were met. No method blank contamination was detected. LCS recoveries were within control limits for all elements. The laboratory duplicate RPD was acceptable. MS recoveries were within control limits except for antimony in sample 401A/DP. In this case, antimony (0%) was below control limits. A post digestion spike for antimony was analyzed and fell within control limits. Results for antimony were rejected (R) in the source sample (401A/DP) and two matrix-similar associated samples (401B/DP and 401C/DP). Non-detected results for antimony in the remaining samples were qualified as estimated (UJ).

TPH as Diesel and Oil. All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within laboratory control limits. The initial calibration curve and continuing calibrations were within acceptance criteria.

Tributyltin. All required holding times were met. No method blank contamination was detected. Surrogate, LCS, and MS recoveries were within

laboratory control limits. IS recoveries were within acceptance criteria. The initial calibration curve and continuing calibrations were within acceptance criteria.

PAHs. All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within laboratory control limits. IS recoveries were within acceptance criteria.

MS recoveries were within control limits except for the recovery for phenanthrene in sample 410B/DP was below the marginal exceedance (ME) limits in the MS and MSD. The recoveries for fluoranthene and pyrene fell below the control limits, but were within the ME limits in the MSD; these compounds were within the control limits in the MS. Results for phenanthrene in the source sample (410B/DP) were qualified as estimated (J). Results for fluoranthene and pyrene were not qualified as the MS was within control limits.

The initial calibration curve was within acceptance criteria. CCVs were within control limits except for the recovery for benz(a)anthracene on May 14, 2012, was low. The laboratory qualified detections in the associated samples with Q. The Q qualifier was changed to J (estimated) in the associated samples (401A/DP, 401B/DP, 401C/DP, 410A/DP, 410B/DP, and 410C/DP).

SVOCs. All required holding times were met. Surrogate and LCS recoveries were within laboratory control limits. IS recoveries were within acceptance criteria. The initial calibration curve was within acceptance criteria.

The method blank was non-detect except for *bis*(2-ethylhexyl)phthalate (BEHP) was detected between the MDL and the RL at 19 µg/kg. The laboratory qualified detections in the associated samples with "B". The results were evaluated as follows.

- Sample results that were greater than five times the method blank detection had the B qualifier removed (401C/DP and 410C/NSM).
- Sample results for BEHP that were less than five times the method blank detection were qualified as U (all other samples).

MS recoveries were within control limits except for the recovery for benzoic acid in sample 410B/NSM failed low in the MSD, but passed in the MS. Associated sample results were not qualified, as the recovery passed in the MS. The RPD for dibenz(a,h)anthracene exceeded the control limits. As the recoveries for dibenz(a,h)anthracene were in control in the MS and MSD, sample results were not qualified.

CCVs were within control limits with the following exceptions:

- CCV 05/12/12: The recovery for pentachlorophenol (PCP) failed low. The results for PCP in the associated samples (401A/DP, 401B/DP, 401C/DP, 401A/NSM, 401B/NSM, 401C/NSM, 410A/DP, 410B/DP, 410C/DP, 410A/NSM, 410B/NSM, and 410C/NSM) were non-detect and qualified as estimated (J).
- CCV 05/14/12: The recoveries for PCP and benzoic acid failed low. The associated sample, 410C/DP, was a diluted reanalysis, and results for PCP and benzoic acid were reported from the undiluted analysis. No sample results were qualified.

For samples 410A/DP, 410A/NSM, 410C/NSM, and 410C/DP, phenol results were qualified by the laboratory with M due to low spectral match parameters. The sample results are estimated, and the M qualifier was changed to J.

Organochlorine Pesticides. All required holding times were met. No method blank contamination was detected. LCS recoveries were within control limits. IS recoveries were within acceptance criteria. The initial calibration curve was within acceptance criteria.

Surrogate recoveries were within laboratory control limits except for the dilution for sample 410C/NSM. The sample was analyzed at a 100-fold dilution, and the surrogates were not recovered. Surrogate recoveries were within control in the undiluted analysis, and no sample results were qualified.

MS recoveries were within laboratory control limits except for sample 410B/NSM. The recoveries for 4,4'-DDT failed low in the MS and MSD. The results were reported from an analysis with a failing DDT breakdown check, and therefore, these results for 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE are not valid. Associated sample results were not qualified due to the MS and MSD failures.

CCVs were within control limits with the following exceptions:

- CCVs 05/15/12 at 0723, 1133, 1636, 2138 and 05/16/12 at 0539: The recoveries for *delta*-BHC failed high on the STX-CLP2 column, but passed on the STX-CLP1 column. The analyte delta-BHC was not a target analyte, and no results were qualified.
- DDT Breakdown Check 05/16/12 at 1006: The breakdown check exceeded 15 percent on both columns. Results for 4,4'-DDT, 4,4'-DDD, and 4,4'-DDE in the associated sample 410C/NSM were reported from the diluted analysis on 05/15/12 with elevated reporting limits. Results for 4,4'-DDT, 4,4'-DDD,

and 4,4′-DDE in the associated MS and MSD were not valid. The MS and MSD were also analyzed at dilution on 05/15/12.

- CCV 05/16/12 at 1024: The recoveries for 4,4′-DDE, 4,4′-DDD, and *gamma*-chlordane failed high on the STX-CLP1 column, while the recoveries for 4,4′-DDT and methoxychlor failed low. The recoveries for delta-BHC and 4,4′-DDD failed high on the STX-CLP2 column, while the recoveries for 4,4′-DDT and methoxychlor failed low. The analytes *delta*-BHC, methoxychlor, and *gamma*-chlordane were not target analytes, and no results were qualified. As the associated DDT breakdown check failed, no results for 4,4′-DDT, 4,4′-DDD, and 4,4′-DDE were reported from this analysis.
- DDT and Endrin Closing Breakdown Checks 05/16/12 at 1229: The DDT breakdown check exceeded 15 percent on both columns; the Endrin breakdown check exceeded 15 percent on the STX-CLP2 column. Endrin was not a target analyte, and sample results were not affected. The laboratory used the internal standard method for analysis, and the closing CCVs and breakdown checks do not affect the preceding sample analysis. No samples were qualified.

The results for 4,4′-DDE in samples 401C/NSM, 410C/NSM, and 410B/NSM and for 4,4′-DDD in sample 410B/DP differed by more than 40 percent between the two chromatographic columns. The laboratory qualified the results with "P". The P qualifier was changed to JP.

The reporting limits for *trans*-chlordane in sample 410C/DP were elevated by the laboratory due to chromatographic interferences and qualified with "Y". The Y qualifier was changed to U. The reporting limits for 4,4′-DDT in sample 410C/NSM were elevated by the laboratory due to chromatographic interferences and qualified with "Y". Sample results were reported from the diluted analysis due to CCV failures.

PCBs. All required holding times were met. No method blank contamination was detected. Surrogate and LCS recoveries were within laboratory control limits. IS recoveries were within acceptance criteria. The initial calibration curve and continuing calibrations were within acceptance criteria. The reporting limits for Aroclors 1248 and 1262 in sample C 1/2-DP were elevated by the laboratory due to chromatographic interferences and qualified with "Y". The reporting limits for Aroclor 1232 in sample C3/4-N2 were elevated by the laboratory due to chromatographic interferences and qualified with "Y". Y qualifiers on sample results were changed to U.

PCBs. All required holding times were met. No method blank contamination was detected. LCS and MS recoveries were within laboratory control limits. IS

recoveries were within acceptance criteria. The initial calibration curve and continuing calibrations were within acceptance criteria. Surrogate recoveries were within laboratory control limits except for sample 410C/NSM. In this case, the recoveries for the surrogates TCMX and DBCP exceeded the control limits. The associated sample results were qualified as estimated (J).

The reporting limits for Aroclors 1242 in sample 410B/DP were elevated by the laboratory due to chromatographic interferences. The reporting limits for Aroclor 1254 in samples 401A/DP and 401A/NSM were elevated by the laboratory due to chromatographic interferences. The reporting limits for Aroclors 1248 and 1254 were elevated by the laboratory in samples 401A/DP, 401B/DP, 401C/DP, 401C/NSM, 410C/NSM, 410A/NSM, and 410B/NSM due to chromatographic interferences. The reporting limits for Aroclors 1242 and 1254 were elevated by the laboratory in samples 410A/DP due to chromatographic interferences. The laboratory qualified the affected results with "Y". The Y qualifier was changed to U.

The results for Aroclor 1248 in samples 401A/DP and 410C/NSM differed by more than 40 percent between the two chromatographic columns. The laboratory qualified the results with "P". The P qualifier was changed to JP.

Grain Size. All required holding times were met. The laboratory triplicate RSD was within criteria.

Table B-1 - QA1 Data Checklist
Terminal 4 Sediment Characterization
11040 N. Lombard Street, Portland, Oregon

	Test Sediment	Reference Sediment	Control Sediment	Water Control
Sample Locations and Compositing				
Latitude and Longitude (to nearest 0.1 second)	NAD 83	NAD 83	N/A	N/A
NAD 1983 HARN (requirement for SEDQUAL)	Yes	Yes	N/A	N/A
Station Name (e.g. Carr Inlet)	Yes	Yes	N/A	N/A
Water depth (corrected to MLLW)	Lead Line	Lead Line		
Drawing showing sampling locations and ID numbers	Yes	In SAP	N/A	N/A
Compositing scheme (sampling locations/depths for composites)	Yes	N/A	N/A	N/A
Sampling method	Yes	Yes	N/A	N/A
Sampling dates	Yes	Yes		
Estimated volume of dredged material represented by each DMMU	Yes	N/A	N/A	N/A
Positioning method	Yes	Yes	N/A	N/A
Sediment Conventionals				
Preparation and analysis methods	Yes	Yes	N/A	N/A
Sediment conventional data and QA/QC qualifiers	Yes	All but TOC	N/A	N/A
QA qualifier code definitions	Yes	Yes	N/A	N/A
Units (dry weight except total solids)	Yes	Yes	N/A	N/A
Method blank data (sulfides, ammonia, TOC)	Yes	Yes	N/A	N/A
Method blank units (dry weight)	Yes	Yes	N/A	N/A
Analysis dates (sediment conventionals, blanks, TOC CRM)	Yes	Yes	N/A	N/A
TOC CRM ID	Yes	N/A	N/A	N/A
TOC CRM analysis data	Yes	N/A	N/A	N/A
TOC CRM target values	Yes	N/A	N/A	N/A
Grain Size Analysis				
Fine grain analysis method	Yes	N/A	N/A	N/A
Analysis dates	Yes	N/A	N/A	N/A
Triplicate for each batch	Yes	N/A	N/A	N/A
Grain size data (complete sieve and phi size distribution)	Yes	N/A	N/A	N/A

	Metals	SVOCs/ PAHs	Pesticides/ PCBs	VOCs
Extraction/digestion method				N/A
Extraction/digestion dates (test sediment, blanks, matrix spike, reference material)	Yes	Yes	Yes	N/A
Analysis method	Yes	Yes	Yes	N/A
Data and QA qualifier included for:				
Test sediments	Yes	Yes	Yes	N/A
Reference materials including 95% confidence interval (each batch)				N/A
Method blanks (each batch)	Yes	Yes	Yes	N/A
Matrix spikes (each batch)	Yes	Yes	Yes	N/A
Matrix spike added (dry weight basis)	Yes	Yes	Yes	N/A
Laboratory control sample (each batch)	Yes	Yes	Yes	N/A
Laboratory control sample duplicate (each batch)	No	No	No	N/A
Replicates (each batch)	Yes			
Continuing calibration verification	Yes	Yes	Yes	N/A
Units (dry weight)	Yes	Yes	Yes	N/A
Method blank units (dry weight)	Yes	Yes	Yes	N/A
QA/QC qualifier definitions	Yes	Yes	Yes	N/A
Surrogate recovery for test sediment, blank, matrix spike, ref. material	Yes (TBT)	Yes	Yes	N/A
Analysis dates (test sediment, blanks, matrix spike, reference material)	Yes	Yes	Yes	N/A

Please refer to notes at the end of this table.

Table B-1 - QA1 Data Checklist
Terminal 4 Sediment Characterization
11040 N. Lombard Street, Portland, Oregon

Notes:
QA Checklist based on Figures 12-2 and 12-3 of the SEF (Corps, et al., 2006).
Shaded boxes indicated those type of data are not applicable for that column.
N/A = Not applicable or not analyzed.

Acronyms and Abbreviations:
CRM = Control Reference Material
DMMU = Dredge Material Management Unit
MLLW = Mean lower low water
NAD = North American Datum
PAHs = Polynuclear aromatic hydrocarbons
PCBs = Polychlorinated biphenyls
QA = Quality assurance
QC = Quality control
SEF = Sediment evaluation framework
SVOCs = Semivolatile organic compounds
TBT = Tributyltin
TOC = Total organic carbon
VOCs = Volatile organic compounds

APPENDIX C
ANALYTICAL LABORATORY REPORT

Analytical Resources, Incorporated
Analytical Chemists and Consultants

May 18, 2012

Mr. Rick Ernst
Hart Crowser, Inc.
8910 SW Gemini Drive
Beaverton, OR 97008-7123

RE: Project: 15753-00, Port of Portland T4 Maintenance
ARI Job No: UU16

Dear Mr. Ernst:

Please find enclosed the Chain-of-Custody (COC) record, sample receipt documentation, and the analytical results for samples from the project referenced above. Analytical Resources, Inc. (ARI) accepted thirteen soil samples on May 11, 2012. The samples were received in good condition. There were no discrepancies between the sample containers' labels and the COC.

Please reference the Case Narrative for analytical details associated with this project.

An electronic copy of this data package will remain on file with ARI. If you have any questions or require additional information, please contact me at your convenience.

Respectfully,

ANALYTICAL RESOURCES, INC.

Kelly Bottem
Client Services Manager
kellyb@arilabs.com
206/695-6211

Enclosures

cc: files UU16

4611 South 134th Place, Suite 100 • Tukwila WA 98168 • **206-695-6200** • **206-695-6201** fax

Table of Contents: ARI Job UU16

Client: Hart Crowser

Project: 15753-00 P.O.P. T4 Maintenance

BC
Signature

May-16-2012
Date

Table of Contents: ARI Job UU16

Client: Hart Crowser

Project: 15753-00 P.O.P. T4 Maintenance

GC

Signature

May-16-2012

Date

Chain of Custody Documentation

ARI Job ID: UU16

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 4116	Turn-around Requested: 3 day	Page: 1 of 2	
ARI Client Company: Hart Crowser	Phone: 503-620-7284	Date: 5/10/12	Ice Present? Y
Client Contact: Rick Ernst		No. of Coolers: 2	Cooler Temps: 1.9, 4.8
Client Project Name: P.O.P. T4 Maintenance			
Client Project #: 15753-00	Samplers: Jason Miles/Chris Martin		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No Containers	Total Solids EPA 160.3	Total Sulfides EPA 376.2	Ammonia EPA 350.1 M	TOC	Diesel & oil NWTPH-Dx	PCBs EPA 8082	Pesticides EPA 8081A	Metals* EPA 6020 Mercury EPA 7471A	SVOCs* EPA 8270D PAHs EPA 8270D-SIM (CW)	TBT (dry wt)	Grain Size ASTM D 422 w/ Hydrometer	Notes/Comments
401A/DP	5/9/12	1750	Sediment	6	X	X	X	X	X	X	X	X	X	X	X	
401B/DP	5/8/12	2225	"	6	X	X	X	X	X	X	X	X	X	X	X	*SVOC includes: Chlorinated Hydrocarbons, Phthalates, Phenols, misc. extractables, & PAHs.
401C/DP	5/9/12	1855	"	6	X	X	X	X	X	X	X	X	X	X	X	
401A/NSM	5/9/12	1800	"	6	X	X	X	X		X	X	X	X (1)	X	X	
401B/NSM	5/8/12	2230	"	6	X	X	X	X		X	X	X	X (1)	X	X	(1) No PAH's w/ SIM level
401C/NSM	5/9/12	1905	▽	6	X	X	X	X		X	X	X	X (1)	X	X	SVOC analysis 8270D levels okay

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
*Metals: Antimony, Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Silver, & Zinc. Also Mercury by EPA 7471A	Printed Name: Chris Martin	Printed Name: Jennifer Mitson	Printed Name:	Printed Name
	Company: Hart Crowser	Company: HR	Company:	Company
	Date & Time: 5/10/12 1400	Date & Time: 5/11/12 1015	Date & Time:	Date & Time

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: UU16	Turn-around Requested: 3day
ARI Client Company: Hart Crowser	Phone: (503) 620-7284
Client Contact: Rick Ernst	
Client Project Name: P.O.P T4 Maintenance	
Client Project #: 15753-00	Samplers: Jason Miles / Chris Martin

Page: 2	of 2		
Date: 5/10/12	Ice Present? Y		
No. of Coolers: 2	Cooler Temps: 1.9, 4.8		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Total Solids EPA 160.3	Total Sulfides EPA 376.2	Ammonia EPA 350.1M	TOC	Diesel & oil NWTPH-Dx	PCBs EPA 8082	Pesticides EPA 8081A	Metals* EPA 6020 - Mercury EPA 7471A	SVOCs * EPA 8270D PM / PAHs EPA 8270D-SIM	TBT (dry wt.)	Grain Size ASTM D422 mod w/ hydrometer	Notes/Comments
410A/DP	5/8/12	2120	Sediment	6	X	X	X	X	X	X	X	X	X	X	X	
410B/DP	5/8/12	1851	↓	6	X	X	X	X	X	X	X	X	X	X	X	*SVOCs include:
410C/DP	5/8/12	2015		6	X	X	X	X	X	X	X	X	X	X	X	Chlorinated Hydrocarbons,
410A/NSM	5/8/12	2130		6	X	X	X	X		X	X	X	X ①	X	X	Phthalates, phenols,
410B/NSM	5/8/12	1900		6	X	X	X	X		X	X	X	X ①	X	X	misc. extractables, & PAHs
410C/NSM	5/8/12	2025		6	X	X	X	X		X	X	X	X ①	X	X	
Reference	5/9/12	0820	↓	2	X	X	X									① No PAH's w/ SIM level
																SVOC analysis 8270D levels okay

Comments/Special Instructions	Relinquished by	Received by	Relinquished by	Received by
*Metals; Antimony, Arsenic, Cadmium, Chromium, Copper, lead, Nickel, silver, & zinc. Also mercury by EPA 7471A	(Signature) [signature]	(Signature) [signature]	(Signature)	(Signature)
	Printed Name: Chris Martin	Printed Name: Jennifer McKay	Printed Name:	Printed Name:
	Company: Hart Crowser	Company: ARI	Company	Company
	Date & Time: 5/10/12 1400	Date & Time: 5/11/12 1015	Date & Time:	Date & Time

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

0016:0004

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Hart Crowser

Project Name: POP T4 Maintenance

COC No(s): _____ (NA)

Delivered by: Fed-Ex (UPS) Courier Hand Delivered Other: _____

Assigned ARI Job No. UU16

Tracking No 1Z 97X 0470 1 488 7285 NA
1Z 97X 0470 1 4702 4891

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? (YES) NO

Were custody papers included with the cooler? (YES) NO

Were custody papers properly filled out (ink, signed, etc.) (YES) NO

Temperature of Cooler(s) (°C) (recommended 2.0-6 0 °C for chemistry) 1.9 4.8 ___ ___

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID# 90877952

Cooler Accepted by: JM Date: 5/11/12 Time: 1015

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? Bubble Wrap (Wet Ice) Gel Packs (Baggies) Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA (YES) NO

Were all bottles sealed in individual plastic bags? YES (NO)

Did all bottles arrive in good condition (unbroken)? (YES) NO

Were all bottle labels complete and legible? (YES) NO

Did the number of containers listed on COC match with the number of containers received? (YES) NO

Did all bottle labels and tags agree with custody papers? (YES) NO

Were all bottles used correct for the requested analyses? (YES) NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) (NA) YES NO

Were all VOC vials free of air bubbles? (NA) YES NO

Was sufficient amount of sample sent in each bottle? (YES) NO

Date VOC Trip Blank was made at ARI (NA) _____

Was Sample Split by ARI (NA) YES Date/Time _____ Equipment _____ Split by: _____

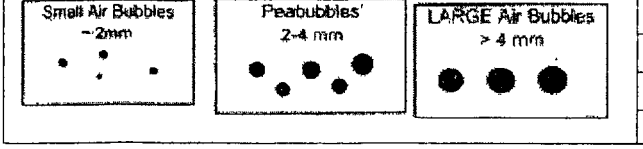
Samples Logged by: JM Date: 5/11/12 Time: 1045

***** Notify Project Manager of discrepancies or concerns *****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By Date



Small → "sm"
Peabubbles → "pb"
Large → "lg"
Headspace → "hs"

FROM:
LOU TRAVIS
(503) 620-7696
HART CROWSER, INC.
8910 SW GEMINI DRIVE
BEAVERTON OR 97008-7123

75 LBS **1 OF 2**
DWT: 24,14,14
AH

H

WA 981 9-04

SHIP TO:
KELLY BOTTEM
(206) 695-6211
ANALYTICAL RESOURCES, INC.
SUITE 100
4611 S 134TH PLACE
SEATTLE WA 98168-3240

UPS NEXT DAY AIR
TRACKING #: 1Z 97X 047 01 4828 7285

1

REF 1:1575300

BILLING: P/P

WS 15 0 16 HP LaserJet P 27 0A 04/2012

Fold here and place in label pouch

UU15 : 00006

FROM:
LOU TRAVIS
(503) 620-7696
HART CROWSER, INC.
8910 SW GEMINI DRIVE
BEAVERTON OR 97008-7123

79 LBS **2 OF 2**
DWT: 24,14,14
AH

SHIP TO:
KELLY BOTTEM
(206) 695-6211
ANALYTICAL RESOURCES, INC.
SUITE 100
4611 S 134TH PLACE
SEATTLE WA 98168-3240

H

WA 981 9-04

UPS NEXT DAY AIR **1**
TRACKING #: 1Z 97X 047 01 4702 4891

REF 1:1575300

BILLING: P/P

WS 15.0 16 HP LaserJet P 27 0A 04/2012

Fold here and place in label pouch

UU15 : 00007

Case Narrative, Data Qualifiers, Control Limits

ARI Job ID: UU16

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Client: Hart Crowser	**ARI Job No.:** UU16
Client Project: P.O.P. T4 Maintenance	**Client Project No.:** 15753-00

Case Narrative

1. Twelve samples were submitted for analysis on May 11, 2012, and were in good condition.
2. The samples were submitted for grain size distribution according to ASTM D422. The samples were prepared according to ASTM D421.
3. An assumed specific gravity of 2.65 was used in the hydrometer calculations.
4. A standard milkshake mixer type device was used to disperse the fine fraction sample.
5. One sample from this job, 401A/DP, was chosen for triplicate analysis. The triplicate data can be found on the QA summary table.
6. The data is provided in summary tables and plots.
7. There were no noted anomalies in the samples or test method.

Released by: Elizabeth Noble *Technician* Date: May 16, 2012

Reviewed by: Lillian Ciotti *Geotechnical Laboratory Manager* Date: 5/16/12

Sample ID Cross Reference Report

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: UU16
Client: Hart Crowser
Project Event: 15753-00
Project Name: P.O.P. T4 Maintenance

	Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1.	401A/DP	UU16A	12-8723	Sediment	05/09/12 17:50	05/11/12 10:15
2.	401B/DP	UU16B	12-8724	Sediment	05/08/12 22:25	05/11/12 10:15
3.	401C/DP	UU16C	12-8725	Sediment	05/09/12 18:55	05/11/12 10:15
4.	401A/NSM	UU16D	12-8726	Sediment	05/09/12 18:00	05/11/12 10:15
5.	401B/NSM	UU16E	12-8727	Sediment	05/08/12 22:30	05/11/12 10:15
6.	401C/NSM	UU16F	12-8728	Sediment	05/09/12 19:05	05/11/12 10:15
7.	410A/DP	UU16G	12-8729	Sediment	05/08/12 21:20	05/11/12 10:15
8.	410B/DP	UU16H	12-8730	Sediment	05/08/12 18:51	05/11/12 10:15
9.	410C/DP	UU16I	12-8731	Sediment	05/08/12 20:15	05/11/12 10:15
10.	410A/NSM	UU16J	12-8732	Sediment	05/08/12 21:30	05/11/12 10:15
11.	410B/NSM	UU16K	12-8733	Sediment	05/08/12 19:00	05/11/12 10:15
12.	410C/NSM	UU16L	12-8734	Sediment	05/08/12 20:25	05/11/12 10:15
13.	Reference	UU16M	12-8735	Sediment	05/09/12 08:20	05/11/12 10:15

Case Narrative
Hart Crowser
15753-00 Port of Portland T4 Maintenance
ARI Job: UU16
May 18, 2012

Sample Receipt:

Analytical Resources, Inc. (ARI) accepted thirteen soil samples in good condition on May 11, 2012 under Sample Delivery Group (SDG) UU16. The samples were received with cooler temperatures of 1.9 and 4.8°C. Select sample containers were archived upon receipt. For further details regarding sample receipt please refer to the enclosed Cooler Receipt Form.

The samples were analyzed for SVOCs, SIM PAHs, Butyl Tins, Pesticides, PCBs, NWTPH-Dx, Metals, Total Solids, TOC, Sulfide, Ammonia, and Grain Size, as requested.

Semivolatiles Analysis (PSDDA):

The samples were extracted on 5/12/12 and the extracts were analyzed between 5/12/12 and 5/14/12 within the method recommended holding times.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): The 5/12/12 CCAL is out of control low for pentachlorophenol. All associated samples that contain analyte have been flagged with a "Q" qualifier.

The 5/14/12 CCAL is out of control low for Pentachlorophenol and Benzoic Acid. All associated samples that contain analyte have been flagged with a "Q" qualifier.

Method Blank (s): Bis(2-Ethylhexylphthalate was present in the method blank at a level that was greater than ½ the reporting limit. All detected results for this compound have been flagged with a "B" qualifier. No further corrective action was taken.

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with the samples.

LCS/LCSD (s): All percent recoveries and RPDs were in control.

MS/MSD (s): The matrix spike duplicate is out of control low for Benzoic Acid with RPDs for Dibenz (g,h,i) perylene. All other QC is in control and no further corrective action was taken.

SIM PAH Analysis:

The samples were extracted on 5/12/12 and the extracts were analyzed on 5/14/12 within the method recommended holding times.

Initial calibration (s): All analytes were within method acceptance criteria.

Case Narrative
Hart Crowser
15753-00 Port of Portland T4 Maintenance
ARI Job: UU16
May 18, 2012

Continuing calibration (s): The CCAL is out of control low for Benzo (a) anthracene. All associated samples that contain analyte have been flagged with a "Q" qualifier.

Method Blank (s): The method blank was free of contamination.

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with the samples.

LCS/LCSD (s): All percent recoveries and RPDs were in control.

MS/MSD (s): The matrix spike and matrix spike duplicate in association with sample 410B/DP are out of control low for Phenanthrene.

Butyl Tin Analysis:

The samples were extracted on 2/8/12 and the extracts were analyzed on 2/11/12 within the method recommended holding times.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated analyses.

Method Blank (s): The method blank was free of contamination

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with the samples.

LCS/LCSD (s): All percent recoveries and RPDs were in control.

MS/MSD (s): Are in control.

Pesticides Analysis (PSDDA):

The samples were extracted on 5/12/12 and the extracts were analyzed on 5/15/12 and 5/16/12 within the method recommended holding times.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): Several of the CCALs were out of control both low and/or high on one column. The samples were re-analyzed at dilutions with similar to same matrix effects.

Case Narrative
Hart Crowser
15753-00 Port of Portland T4 Maintenance
ARI Job: UU16
May 18, 2012

Method Blank (s): The method blank was free of contamination

Surrogate(s): Are in control.

Samples: There were no anomalies associated with the samples.

LCS/LCSD (s): Are in control.

MS/MSD (s): The matrix spike in association with sample 410B/NSM is out of control low for 4,4-DDT.

PCBs Analysis (PSDDA):

The samples were extracted on 5/12/12 and the extracts were analyzed on 5/14/12 within the method recommended holding times.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated analyses.

Method Blank (s): The method blank was free of contamination

Surrogate(s): The surrogates DCBP and TCMX are out of control high in association with sample 410C/NSM. All other surrogate recoveries were within control limits.

Samples: There were no anomalies associated with the samples.

LCS/LCSD (s): All percent recoveries and RPDs were in control.

MS/MSD (s): Are in control.

Acid/Silica Cleaned NWTPH-Dx Analysis:

The samples were extracted on 5/11/12 and the extracts were analyzed on 5/12/12 within the method recommended holding times.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated analyses.

Method Blank (s): The method blank was free of contamination

Case Narrative
Hart Crowser
15753-00 Port of Portland T4 Maintenance
ARI Job: UU16
May 18, 2012

Surrogate(s): All surrogate recoveries were within control limits.

Samples: There were no anomalies associated with the samples.

LCS/LCSD (s): All percent recoveries and RPDs were in control.

Total Metals Analysis:

The samples were digested on 5/11/12 and analyzed on 5/14/12 within the method recommended holding time.

Initial calibration (s): All analytes were within method acceptance criteria.

Continuing calibration (s): All analytes of interest were within method acceptance criteria for the associated analyses.

Method Blank (s): The method blank was free of contamination.

Samples: There were no anomalies associated with the samples.

Blank Spike (s): All percent recoveries were in control.

Matrix Spike/Duplicate (s): The matrix spike percent recovery of antimony fell outside the control limit low for sample **401A/DP**. A post digestion spike was performed and the recovery was within control limits.

All duplicate RPDs were within control limits.

Conventional Parameters (TS, NH3, S2, TOC):

The samples were prepared and analyzed between 5/11/12 and 5/15/12 within the method recommended holding time.

Method Blank (s): The method blanks were free of contamination

Samples: There were no anomalies associated with the samples.

LCS/SRM (s): All percent recoveries were in control.

Matrix Spike/Replicate (s): Are in control.

Geotechnical Parameters (Grain Size):

Case Narrative
Hart Crowser
15753-00 Port of Portland T4 Maintenance
ARI Job: UU16
May 18, 2012

A laboratory-specific Case Narrative follows this page.

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Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).

S — Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte

NA — The flagged analyte was not analyzed for

NR — Spiked compound recovery is not reported due to chromatographic interference

NS — The flagged analyte was not spiked into the sample

M — Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses

M2 — The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.

N — The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"

Y — The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.

EMPC — Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**

C — The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column

P — The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference

X — Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**

Z — Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A	The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
F	Samples were frozen prior to particle size determination
SM	Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
SS	Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
W	Weight of sample in some pipette aliquots was below the level required for accurate weighting

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Data Reporting Qualifiers

Effective 2/14/2011

Inorganic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Duplicate RPD is not within established control limits
B	Reported value is less than the CRDL but ≥ the Reporting Limit
N	Matrix Spike recovery not within established control limits
NA	Not Applicable, analyte not spiked
H	The natural concentration of the spiked element is so much greater than the concentration spiked that an accurate determination of spike recovery is not possible
L	Analyte concentration is ≤5 times the Reporting Limit and the replicate control limit defaults to ±1 RL instead of the normal 20% RPD

Organic Data

U	Indicates that the target analyte was not detected at the reported concentration
*	Flagged value is not within established control limits
B	Analyte detected in an associated Method Blank at a concentration greater than one-half of ARI's Reporting Limit or 5% of the regulatory limit or 5% of the analyte concentration in the sample.
J	Estimated concentration when the value is less than ARI's established reporting limits
D	The spiked compound was not detected due to sample extract dilution
E	Estimated concentration calculated for an analyte response above the valid instrument calibration range. A dilution is required to obtain an accurate quantification of the analyte.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20%Drift or minimum RRF).

S	Indicates an analyte response that has saturated the detector. The calculated concentration is not valid; a dilution is required to obtain valid quantification of the analyte
NA	The flagged analyte was not analyzed for
NR	Spiked compound recovery is not reported due to chromatographic interference
NS	The flagged analyte was not spiked into the sample
M	Estimated value for an analyte detected and confirmed by an analyst but with low spectral match parameters. This flag is used only for GC-MS analyses
M2	The sample contains PCB congeners that do not match any standard Aroclor pattern. The PCBs are identified and quantified as the Aroclor whose pattern most closely matches that of the sample. The reported value is an estimate.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification"
Y	The analyte is not detected at or above the reported concentration. The reporting limit is raised due to chromatographic interference. The Y flag is equivalent to the U flag with a raised reporting limit.
EMPC	Estimated Maximum Possible Concentration (EMPC) defined in EPA Statement of Work DLM02.2 as a value "calculated for 2,3,7,8-substituted isomers for which the quantitation and /or confirmation ion(s) has signal to noise in excess of 2.5, but does not meet identification criteria" **(Dioxin/Furan analysis only)**
C	The analyte was positively identified on only one of two chromatographic columns. Chromatographic interference prevented a positive identification on the second column
P	The analyte was detected on both chromatographic columns but the quantified values differ by ≥40% RPD with no obvious chromatographic interference
X	Analyte signal includes interference from polychlorinated diphenyl ethers. **(Dioxin/Furan analysis only)**
Z	Analyte signal includes interference from the sample matrix or perfluorokerosene ions. **(Dioxin/Furan analysis only)**

Geotechnical Data

A	The total of all fines fractions. This flag is used to report total fines when only sieve analysis is requested and balances total grain size with sample weight.
F	Samples were frozen prior to particle size determination
SM	Sample matrix was not appropriate for the requested analysis. This normally refers to samples contaminated with an organic product that interferes with the sieving process and/or moisture content, porosity and saturation calculations
SS	Sample did not contain the proportion of "fines" required to perform the pipette portion of the grain size analysis
W	Weight of sample in some pipette aliquots was below the level required for accurate weighting

3/14/12

SURR SOLUTIONS

LABEL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
A	1953-4	ABN	100/150	MEOH	07/05/12
B	1917-2	SIM PNA	15/75	ACETONE	05/30/12
C	NA	SIM ABN	25/37.5	MEOH	NA
D	1925-5	LOW PCB	0.2	ACETONE	05/28/12
E	1900-2	HERB	62.5	MEOH	10/06/12
F	1919-5	PCP	12.5	ACETONE	12/09/12
G	1906-3	d8-DIOXANE	100	MEOH	04/30/12
H	1847-2	OP-PEST	25	ACETONE	03/23/12
I	1896-3	LOW S. PNA	1.5	ACETONE	09/22/12
J	1915-4	TBT-PORE	0.125	MECL2	11/23/12
K	1925-4	MED PCB	20	ACETONE	05/28/12
L	1915-3	TBT	2.5	MECL2	11/23/12
M	1888-4	EPH	1500	MECL2	04/04/12
N	1914-2	PCB	2	ACETONE	05/28/12
O	1947-2	TPH	450	MECL2	09/28/12
P	1948-3	HCID	2250	MECL2	09/28/12
Q	NA	EDB	1	MEOH	NA
R	NA	RESIN ACID	250	ACETONE	NA
S	1864-1	PBDE	.5	MEOH	05/21/12
T	1884-2	ALKYL PNA	10	MEOH	07/15/12
U	NA	CONGENER	2.5	ACETONE	NA
V	1925-2	LOW PCP	1.25	ACETONE	12/09/12

3/14/12

LCS SOLUTIONS

LABL	SOLN ID	TEST	CONC. UG/ML	SOLVENT	EXP.
1	1907-1	PCB 1660	20	ACETONE	11/01/12
2#		BCOC PEST	10	ACETONE	NA
3	1922-2	PEST	01/02/10	ACETONE	12/13/12
4	1922-3	LOW PEST	.1/.2/1	ACETONE	12/13/12
5	1902-4	EPH	1500	MECL2	10/04/12
6	1919-2	PCP	12.5/125	ACETONE	10/15/12
7	1926-2	ABN	100	MEOH	05/31/12
8	1916-2	TBT	2.5	MECL2	11/23/12
9	1918-2	PORE TBT	.125/.25	MECL2	11/23/12
10					
11	1860-4	TPHD	15000	ACETONE	05/12/12
12					
13	1948-1	LOW PCB	2	ACETONE	11/01/12
14					
15	1929-1	SIM PNA	15/75	MEOH	06/21/12
16	1906-4	1,4-DIOXANE	100	MEOH	04/30/12
17	1869-4	1248 PCB	10	ACETONE	06/14/12
18	1927-2	LOW SIM PNA	1.5	ACETONE	06/20/12
19	1931-1	AK103	7500	ACETONE	05/17/12
20	1930-1	PNA	100	ACETONE	06/23/12
21	1943-2	SKY/BHT	100	MEOH	07/27/12
22	1957-1	HERB	04 to 5000	MEOH	04/22/12
23	1887-2	EXTRA PNA	15	ACETONE	08/25/12
24					
25#		DIPHENYL	100	MEOH	NA
26	1951-2	OP-PEST	25	MEOH	03/31/12
27		STEROLS	200	MEOH	NA
28#		ADD. PEST	2	ACETONE	NA
29#		DECANES	100	MEOH	NA

LCS SOLUTIONS

3/14/12

30		EDB/DBCP	0.2	MEOH	NA
31	1944-1	TERPINEOL	100	MEOH	07/27/12
32	NA	GUAIACOL	50-200	ACETONE	NA
33		RETENE	100	MEOH	NA
34	NA	CONGENERS	0.5	ACETONE	NA
35	1875-3	ALKYL PNA A	10	MEOH	07/18/12
36		ALKYL PNA B	10	MEOH	NA
37		CAR/PERY	100	ACETONE	NA
38	1926-3	ABN ACID	200-450	MEOH	06/19/12
39	1853-4	BENZIDINE	500	MEOH	04/30/12
40	1851-3	PBDE	0.5	MEOH	04/22/12
50	1900-1	FULL RESIN	250	ACETONE	08/12/12
51		DDTS	0.01	ACETONE	NA
52		1232 PCB	20	ACETONE	NA
53	1919-1	DALAPON	50	MEOH	08/22/12
54		T-CHLORDANE	10	ACETONE	NA
55		TOXAPHENE	50	ACETONE	NA
56	1952-3	ABN BASE	50-200	MEOH	08/14/12
#=PROJECT SPECIFIC SOLUTION					

DL[1] LOD[1], LOQ[1] and Control Limits Summary
GC - MS – SVOA Analysis of Sediment
EPA Method 8270 Full Scan & SIM

Microwave Extraction (EPA Method 3546) - 10 g sample with extract concentrated to 1 mL final volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	Full Scan Analysis			SIM Analysis			LCS,MS Control Limits	RPD[2]
	DL	LOD	LOQ	DL	LOD	LOQ		
Phenol	8.65	10	**20**	2.56	5	**5**	30 – 160	≤ 40
bis-(2-Chloroethyl)ether	3.35	10	**20**	--	--	--	30 – 160	≤ 40
2-Chlorophenol	2.39	10	**20**	--	--	--	30 – 160	≤ 40
1,3-Dichlorobenzene	2.63	10	**20**	1.31	2.5	**5**	30 – 160	≤ 40
1,4-Dichlorobenzene	2.86	10	**20**	1.19	2.5	**5**	30 – 160	≤ 40
1,2-Dichlorobenzene	2.50	10	**20**	1.10	2.5	**5**	30 – 160	≤ 40
Benzyl alcohol	6.09	10	**20**	7.04	10	**20**[3]	30 – 160	≤ 40
2,2'-oxy-*bis*-(1-Chloropropane)	3.76	10	**20**	--	--	--	30 – 160	≤ 40
2-Methylphenol	5.25	10	**20**	1.81	2.5	**5**	30 – 160	≤ 40
Hexachloroethane	2.94	10	**20**	--	--	--	30 – 160	≤ 40
N-Nitroso-di-n-propylamine	3.36	10	**20**	9.48	10	**12**[3]	30 – 160	≤ 40
4-Methylphenol[6]	6.63	20	**40**	2.52	5	**10**	30 – 160	≤ 40
Nitrobenzene	4.06	10	**20**	--	--	--	30 – 160	≤ 40
Isophorone	2.86	10	**20**	--	--	--	30 – 160	≤ 40
2-Nitrophenol	38.7	50	**100**	--	--	--	30 – 160	≤ 40
2,4-Dimethylphenol	3.46	20	**40**	2.89	10	**20**	30 – 160	≤ 40
bis-(2-Chloroethoxy)methane	2.00	10	**20**	--	--	--	30 – 160	≤ 40
2,4-Dichlorophenol	21.5	100	**200**	--	--	--	30 – 160	≤ 40
1,2,4-Trichlorobenzene	3.48	10	**20**	1.86	2.5	**5**	30 – 160	≤ 40
Naphthalene	2.76	10	**20**	--	--	--	30 – 160	≤ 40
Benzoic acid	101	200	**400**[5]	--	--	--	30 – 160	≤ 40
4-Chloroaniline	22.3	135	**270**[4]	--	--	--	30 – 160	≤ 40
Hexachlorobutadiene	4.57	50	**100**	0.96	2.5	**5**	30 – 160	≤ 40
4-Chloro-3-methylphenol	15.1	50	**100**	--	--	--	30 – 160	≤ 40
2-Methylnaphthalene	3.06	10	**20**	--	--	--	30 – 160	≤ 40
Hexachlorocyclopentadiene	66.4	200	**400**[4]	--	--	--	30 – 160	≤ 40
2,4,6-Trichlorophenol	22.4	50	**100**	--	--	--	30 – 160	≤ 40
2,4,5-Trichlorophenol	21.4	50	**100**	--	--	--	30 – 160	≤ 40
2-Chloronaphthalene	2.64	10	**20**	--	--	--	30 – 160	≤ 40
2-Nitroaniline	18.4	50	**100**	--	--	--	30 – 160	≤ 40
Acenaphthylene	5.71	10	**20**	--	--	--	30 – 160	≤ 40
Dimethylphthalate	2.90	10	**20**	1.34	2.5	**5**	30 – 160	≤ 40
2,6-Dinitrotoluene	30.6	50	**100**	--	--	--	30 – 160	≤ 40
Acenaphthene	3.28	10	**20**	--	--	--	30 – 160	≤ 40
3-Nitroaniline	22.5	50	**100**	--	--	--	30 – 160	≤ 40
2,4-Dinitrophenol	111	425	**850**[4]	--	--	--	30 – 160	≤ 40

DL[1] LOD[1], LOQ[1] and Control Limits Summary
GC - MS – SVOA Analysis of Sediment
EPA Method 8270 Full Scan & SIM

Microwave Extraction (EPA Method 3546) - 10 g sample with extract concentrated to 1 mL final volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	Full Scan Analysis			SIM Analysis			LCS,MS Control Limits	RPD[2]
	DL	LOD	LOQ	DL	LOD	LOQ		
Dibenzofuran	4.10	10	**20**	--	--	--	30 – 160	≤ 40
4-Nitrophenol	34.7	50	**100**	--	--	--	30 – 160	≤ 40
2,4-Dinitrotoluene	19.5	50	**100**	--	--	--	30 – 160	≤ 40
Fluorene	4.35	10	**20**	--	--	--	30 – 160	≤ 40
4-Chlorophenyl-phenylether	5.29	10	**20**	--	--	--	30 – 160	≤ 40
Diethylphthalate	36.6	50	**50**[3]	3.26	5.0	**5.0**	30 – 160	≤ 40
4-Nitroaniline	37.9	50	**100**	--	--	--	30 – 160	≤ 40
4,6-Dinitro-2-methylphenol	21.2	100	**200**	--	--	--	30 – 160	≤ 40
N-Nitrosodiphenylamine	5.39	10	**20**	1.38	10	**20**	30 – 160	≤ 40
4-Bromophenyl-phenylether	5.03	10	**20**	--	--	--	30 – 160	≤ 40
Hexachlorobenzene	4.29	10	**20**	1.26	2.5	**5**	30 – 160	≤ 40
Pentachlorophenol	48.5	100	**200**[4]	14.3	25	**50**	30 – 160	≤ 40
Phenanthrene	3.64	10	**20**	--	--	--	30 – 160	≤ 40
Anthracene	4.50	10	**20**	--	--	--	30 – 160	≤ 40
Carbazole	2.69	10	**20**	--	--	--	30 – 160	≤ 40
Di-n-butylphthalate	8.16	10	**20**	--	--	--	30 – 160	≤ 40
Fluoranthene	2.91	10	**20**	--	--	--	30 – 160	≤ 40
Pyrene	1.94	10	**20**	--	--	--	30 – 160	≤ 40
Butylbenzylphthalate	6.14	10	**20**	2.89	5.0	**5**	30 – 160	≤ 40
Benzo(a)anthracene	3.29	10	**20**	--	--	--	30 – 160	≤ 40
3,3'-Dichlorobenzidine	17.8	75	**150**[4]	--	--	--	30 – 160	≤ 40
Chrysene	3.75	10	**20**	--	--	--	30 – 160	≤ 40
bis-(2-Ethylhexyl)phthalate	14.6	20	**25**[3]	--	--	--	30 – 160	≤ 40
Di-n-octylphthalate	5.84	10	**20**	--	--	--	30 – 160	≤ 40
Benzo(b)fluoranthene[7]	3.47	10	**20**	--	--	--	30 – 160	≤ 40
Benzo(k)fluoranthene[7]	4.18	10	**20**	--	--	--	30 – 160	≤ 40
Benzofluoranthene-Total[8]	6.67	20	**40**	--	--	--	30 – 160	≤ 40
Benzo(a)pyrene	5.45	10	**20**	--	--	--	30 – 160	≤ 40
Indeno(1,2,3-cd)pyrene	4.68	10	**20**	--	--	--	30 – 160	≤ 40
Dibenzo(a,h)anthracene	4.31	10	**20**	2.02	2.5	**5**	30 – 160	≤ 40
Benzo(g,h,i)perylene	4.40	10	**20**	--	--	--	30 – 160	≤ 40
N-Nitrosodimethylamine	14.1	50	**100**	3.15	13	**25**	30 – 160	≤ 40
Aniline	40.0	270	**540**[4]	--	--	--	30 – 160	≤ 40
Pyridine	32.7	75	**150**[4]	--	--	--	30 – 160	≤ 40
1-Methylnaphthalene	2.68	10	**20**	--	--	--	30 – 160	≤ 40
Azobenzene (1,2-DP-Hydrazine)	2.98	10	**20**	--	--	--	30 – 160	≤ 40

DL[1] LOD[1], LOQ[1] and Control Limits Summary
GC - MS – SVOA Analysis of Sediment
EPA Method 8270 Full Scan & SIM

Microwave Extraction (EPA Method 3546) - 10 g sample with extract concentrated to 1 mL final volume

LOD Spike level = LOQ (unless otherwise noted)

Analyte	Full Scan Analysis			SIM Analysis			LCS,MS Control Limits	RPD[2]
	DL	LOD	LOQ	DL	LOD	LOQ		
Surrogate Standards						**MB / LCS**	**Samples**	**RPD**
2-Fluorophenol						30 – 160	30 – 160	≤ 40
Phenol-d_5						30 – 160	30 – 160	≤ 40
2-Chlorophenol-d_4						30 – 160	30 – 160	≤ 40
1,2-Dichlorobenzene-d_4						30 – 160	30 – 160	≤ 40
Nitrobenzene-d_5						30 – 160	30 – 160	≤ 40
2-Fluorobiphenyl						30 – 160	30 – 160	≤ 40
2,4,6-Tribromophenol						30 – 160	30 – 160	≤ 40
p-Terphenyl-d_{14}						30 – 160	30 – 160	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD), Limit of Quantitation (LOQ) are defined in ARI SOP 1018S
(2) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$

(3) Spiked at 5 ppb
(4) Spiked at 100 ppb
(5) Spiked at 200 ppb
(6) 3-Methylphenol (not calibrated) co-elutes with 4-Methylphennol (calibrated)
(7) Benzo(b)fluoranthene and Benzo(k)fluoranthene are reported as separate analytes only when the height of the valley between the isomer peaks is less than than 50% of the average of the two peak heights, otherwise total Benzofluoranthenes are reported.
(8) Benzo(b)fluoranthene + Benzo(j)fluoranthene + Benzo(k)fluoranthene (only the b & k isomers are calibrated)

DL, LOD, LOQ and Control Limits Summary
Analysis of Solid Samples for PNA EPA Method 8270 – SIM

Microwave (EPA 3546) or Sonication (EPA 3550C) Extraction using 10 g sample with extract with 0.5 mL final volume. ARI Bench Sheet 3060F or 3051F ARI Analyses: PNSSMI & PNSSCI

Analyte	DL[1] µg/kg	LOD[1,2] µg/kg	LOQ[1] µg/kg	LCS Control Limit[3,4]	Replicate RPD[5]
Naphthalene	2.63	**5.0**	**5.0**	37 – **100**	≤ 40
1-Methylnaphthalene	1.71	**2.5**	**5.0**	30 – 160[6]	≤ 40
2-Methylnaphthalene	1.52	**2.5**	**5.0**	37 – **100**	≤ 40
Biphenyl	1.44	**2.5**	**5.0**	30 – 160[6]	≤ 40
2,6-Dimethylnapthalene	0.75	**2.5**	**5.0**	30 – 160[6]	≤ 40
Acenaphthylene	1.26	**2.5**	**5.0**	35 – **100**	≤ 40
Acenaphthene	1.32	**2.5**	**5.0**	39 – **100**	≤ 40
Dibenzofuran	1.51	**2.5**	**5.0**	39 – **100**	≤ 40
1,6,7-Trimethylnaphthalene	0.42	**2.5**	**5.0**	30 – 160[6]	≤ 40
Fluorene	1.29	**2.5**	**5.0**	42 – **100**	≤ 40
Benzothiophene	0.43	**2.5**	**5.0**	30 – 160[6]	≤ 40
Phenanthrene	1.98	**2.5**	**5.0**	47 – **100**	≤ 40
Anthracene	1.46	**2.5**	**5.0**	41 – 106	≤ 40
Carbazole	0.62	**2.5**	**5.0**	30 – 160[6]	≤ 40
1-Methylphenanthrene	0.70	**2.5**	**5.0**	30 – 160[6]	≤ 40
Fluoranthene	1.77	**4.0**	**5.0**	52 – 109	≤ 40
Pyrene	2.22	**4.0**	**5.0**	47 – 111	≤ 40
Benzo(a)anthracene	1.60	**2.5**	**5.0**	47 – 114	≤ 40
Chrysene	1.88	**2.5**	**5.0**	51 – 106	≤ 40
Benzo(b)fluoranthene	1.90	**2.5**	**5.0**	30 – 160[6]	≤ 40
Benzo(k)fluoranthene	2.05	**2.5**	**5.0**	30 – 160[6]	≤ 40
Benzo(e)pyrene	0.65	**2.5**	**5.0**	30 – 160[6]	≤ 40
Benzo(a)pyrene	1.75	**2.5**	**5.0**	44 – 111	≤ 40
Indeno(1,2,3-cd)pyrene	3.47	**4.0**	**5.0**	41 – 114	≤ 40
Dibenz(a,h)anthracene	2.38	**4.0**	**5.0**	42 – 116	≤ 40
Benzo(g,h,i)perylene	3.05	**4.0**	**5.0**	37 – 115	≤ 40
Perylene	2.99	**4.0**	**5.0**	30 – 160[6]	≤ 40
Surrogate Recovery			**MB / LCS**	**Samples**	**RPD**
2-Methylnapthalene-d_{10}			35 – **100**	34 – **100**	≤ 40
Dibenzo(a,h)anthracene-d_{14}			37 – 120	**10** – 117	≤ 40

(1) Detection Limit (DL), Limit of Detection (LOD), Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) LOD verification performed 8/26/11 ARI Sample TJ75I
(3) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(4) Control limits calculated using all data from 1/1/08 through 12/31/08.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$
(6) Default limits pending generation of historic limits.

Quality Control Summary for Butyl Tin Compounds
EPA Methods 8270D – SIM

Analyte	DL[1]	LOD[1]	LOQ[1]	Spike Recovery Limits (%)[2, 3]			RPD[4]
				LCS	MB/LCS Surrogate	Sample Surrogate	
TBTWSI – Aqueous Samples (Separatory Funnel Extraction – 100 to 0.5 mL) EPA Method 3510C – ARI Benchsheet TBT#1 – 3043F							
Tributyl Tin Ion[5]	0.043 µg/L	0.096 µg/L	0.193 µg/L	30-160	--	--	≤ 40
Dibutyl Tin Ion[5]	0.096 µg/L	0.216 µg/L	0.433 µg/L	30-160	--	--	≤ 40
Butyl Tin Ion[5]	0.108 µg/L	0.153 µg/L	0.306 µg/L	30-160	--	--	≤ 40
Tripentyl Tin	--	--	--	--	30-160	30-160	≤ 40
Tripropyl Tin	--	--	--	--	30-160	30-160	≤ 40
TBTWSI – Pore Water Samples (Separatory Funnel Extraction – 150 to 0.5 mL) EPA Method 3510C – ARI Benchsheet TBT #3 – 3047F							
Tributyl Tin Ion[6]	--	--	0.0052 µg/L	30-160	--	--	≤ 40
Dibutyl Tin Ion[6]	--	--	0.0077µg/L	30-160	--	--	≤ 40
Butyl Tin Ion[6]	--	--	0.0054 µg/L	30-160	--	--	≤ 40
Tripentyl Tin	--	--	--	--	30-160	30-160	≤ 40
Tripropyl Tin	--	--	--	--	30-160	30-160	≤ 40
TBTSMI – Soil / Sediment Samples (Microwave Extraction – 5g dry wt to 0.5mL) EPA Method 3546 – ARI Benchsheet TBT#4 – 3064F							
Tributyl Tin Ion	1.52 µg/kg	1.93 µg/kg	3.86 µg/kg	40 – 144	--	--	≤ 40
Dibutyl Tin Ion	3.72 µg/kg	4.33 µg/kg	5.78 µg/kg	34 – 115	--	--	≤ 40
Butyl Tin Ion	2.95 µg/kg	3.06 µg/kg	4.08 µg/kg	**10** – 111	--	--	≤ 40
Tripentyl Tin	--	--	--	--	35 – 130	25 – 140	≤ 40
Tripropyl Tin	--	--	--	--	28 – 106	32 – 104	≤ 40

(1) Detection Limit (DL), limit of detection (LOD) and limit of quantation (LOQ) as defined in ARI SOP 1018S.
(2) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(3) 30 – 160 are default, advisory control limits used when there is insufficient data to calculate historic control limits. These limits are not used as the sole reason to reject data from a batch of of analyzes.
(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$

(5) DL from ARI MDL study QD32
(6) ARI does not report concentrations below the LOQ (low calibration standard concentration) and does not, therefore, determine a DL or LOD for butyl tin analysis in interstitial (pore) water.

Analytical Resources,Incorporated
Analytical Chemists and Consultants

Spike Recovery Control Limits for Chlorinated Pesticides EPA Method SW-846-8081B Analysis of Soil / Sediment Samples [1,2]

Effective 10/25/11

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. http://www.arilabs.com/portal/downloads/ARI-CLs.zip

Sample Dry Weight / Final Vol.	**12.5 g to 2.5 mL**	
Extraction Method	**Microwave EPA Method 3546**	
LCS Spike Recovery [5]	**Control Limits**	**ME Limits[3]**
alpha-BHC	49 - 111	39 - 121
beta-BHC	54 - 107	45 - 116
delta-BHC	72 - 112	65 - 119
gamma-BHC (Lindane)	54 - 115	44 - 125
Heptachlor	45 - 133	30 - 148
Aldrin	53 - 114	43 - 124
Hepachlor Epoxide	60 - 121	50 - 131
Endosulfan I	40 - 129	25 - 144
Dieldrin	68 - 123	59 - 132
4,4'-DDE	66 - 124	56 - 134
Endrin	60 - 135	48 - 148
Endosulfan II	46 - 130	32 - 144
4,4'-DDD	54 - 129	42 - 142
Endosulfan Sulfate	36 - 110	24 - 122
4,4'-DDT	50 - 133	36 - 147
Methoxychlor	46 - 138	31 - 153
Endrin Ketone	45 - 131	31 - 145
Endrin Aldehyde	25 - **100**	13 - 113
trans-Chlordane (*beta*-Chlordane, *gamma*-Chlordane)	66 - 119	57 - 128
cis-Chlordane (*alpha*-chlordane)	62 - 119	53 - 129
Hexachlorobenzene	41 - 108	30 - 119
Hexachlorobutadiene	39 - **100**	29 - 110
MB / LCS Surrogate Recovery		
Tetrachloro-*m*-xylene (TCMX)	42 - 112	(4)
Decachlorobiphenyl	59 - 123	(4)
Sample Surrogate Recovery		
Tetrachloro-xylene (TCMX)	29 - 142	(4)
Decachlorobiphenyl	22 - 156	(4)

(1) Control limits calculated using all available spike recovery data from 1/1/11 to 10/1/11.
(2) Highlighted control limits (**bold font**) adjusted to demonstrate that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(3) **ME** = A **marginal exceedance** defined in the NELAC Standard [6] as beyond the LCS-CL but still within the ME limits. ME limits are between 3 and 4 standard deviations around the mean. A maximum of one marginal exceedance is acceptable. Two or more marginal exceedances require corrective action.
(4) Marginal Exceedances not allowed for a surrogate standard.
(5) Laboratory Control Sample (LCS) spike recovery control limits also used as advisory control limits for sample matrix spike (MS) analyzes. MS recovery values are advisory and not used to assess the acceptability of an analytical batch.
(6) **2003 NELAC Standard (EPA/600/R-04/003), July 2003**, Chapter 5, pages 251-252.

Analytical Resources,Incorporated
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Quality Control Criteria for Analysis of Solid Matrix Samples for Aroclors (Polychlorinated Biphenyls – PCB) EPA Method 8082B

Analysis Code	Extraction	DL[1] (ppb)	LOD[1] (ppb)	LOQ[1] (ppb)	Analyte	Spike Recovery Control Limits (%)[2,3,8]			RPD[4]
						LCS	MB/LCS Surrogate	Sample Surrogate	
Soil / Sediment Samples (Microwave Extraction – EPA Method 3546)									
PCBSMI 15-3067F	12g to 4 mL	9.83	17	33	Aroclor 1016	55 – 109	--	--	≤ 40
		7.06	17	33	Aroclor 1260	50 – 125	--	--	
PCBSCI 08-3025F		--	--	--	TCMX	--	53 – 108	39 – 122	
		--	--	--	DCBP	--	49 – 126	31 – 140	
PCBDMP20 05-3017F	12.5 g to 2.5 mL[6]	9.33	10	20[6]	Aroclor 1016	46 – 110	--	--	≤ 40
		10.82	15	20[6]	Aroclor 1260	47 – 124	--	--	
PCBDCP20 06-3026F		--	--	--	TCMX	--	43 – 107	34 – 109	
		--	--	--	DCBP	--	48 – 123	24 – 127	
PCBDMP10 05-3017F	12.5 g to 2.5 mL[6]	0.759	5	10[6]	Aroclor 1016	46 – 110	--	--	≤ 40
		1.066	5	10[6]	Aroclor 1260	47 – 124	--	--	
PCBDCP10 06-3026F		--	--	--	TCMX	--	43 – 107	34 – 109	
		--	--	--	DCBP	--	48 – 123	24 – 127	
PCBDMP4 05-3017F	12.5 g to 2.5 mL[6]	0.577	2	4[6]	Aroclor 1016	46 – 110	--	--	≤ 40
		0.610	2	4[6]	Aroclor 1260	47 – 124	--	--	
PCBDCP4 06-3026F		--	--	--	TCMX	--	43 – 107	34 – 109	
		--	--	--	DCBP	--	48 – 123	24 – 127	
Soil / Sediment Samples Medium Level (Vortex Extraction – EPA Method 3546)									
PCBSVX 12-3019F	5 g to 40 mL	109[7]	400	800	Aroclor 1016	30 – 160	--	--	≤ 40
		192[7]	400	800	Aroclor 1260	30 – 160	--	--	
		--	--	--	TCMX	--	30 – 160	30 – 160	
		--	--	--	DCBP	--	30 – 160	30 – 160	

(1) Detection Limit (DL), Limit of Detection (LOD) & Limit of Quantitation (LOQ) are defined in ARI SOP 1018S.
(2) Highlighted control limits (**bold font**) are adjusted from the calculated values to reflect that ARI does not use control limits < 10 for the lower limit or < 100 for the upper limit.
(3) 30 – 160 are default limits used when there is insufficient data to calculate historic control limits
(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

(6) LOQ determined by lowest concentration used to calibrate the GC-ECD instrument.
(7) MDL Study PC66 6/24/09
(8) Control Limits calculated using all data generated between 1/1/11 and 11/30/11

Analytical Resources, Incorporated
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Quality Control Criteria
Total Petroleum Hydrocarbons
(Diesel & Motor Oil)

Analysis Code	Analyte[5]	DL[1]	LOD[1]	LOQ[2] ppm	Spike % Recovery Control Limits[3]			RPD[4]
					LCS	MB/LCS Surrogate	Sample Surrogate	
HCIWVX	NWTPH-HCID – Water Samples	--	--	0.50 [7]	--	--	50-150	≤ 40
HCISVX	NWTPH-HCID – Solid Samples	--	--	50 [7]	--	--	50-150	
Aqueous Samples – No Extract Clean-up – Separatory Funnel Extraction – 500 to 1.0 mL								
DIESWI	DRO – NWTPH-Dext (C_{12}-C_{24})	0.022	0.05	0.1	64-112	50-150	50-150	≤ 40
AK2WSI	DRO – AK102 (C_{10}-C_{25})	0.022	0.05	0.1	75-125 [6]	60-120	50-150	
OILWSI	RRO – NWTPH-Dext (C_{24}-C_{38})	0.044	0.1	0.2	64-112	50-150	50-150	
AK3WSI	RRO – AK103 (C_{25}-C_{36})	0.030 [9]	0.1	0.2	60-120 [6]	60-120	50-150	
Aqueous Samples – With Acid and/or Silica Gel Clean-up – Separatory Funnel Extraction – 500 to 1.0 mL								
DIESWI	DRO – NWTPH-Dext (C_{12}-C_{24})	0.039	0.05	0.1	61-104	50-150	50-150	≤ 40
AK2WSI	DRO – AK102 (C_{10}-C_{25})	0.042	0.05	0.1	75-125 [6]	60-120	50-150	
OILWSI	RRO – NWTPH-Dext (C_{24}-C_{38})	0.010	0.1	0.2	61-104	50-150	50-150	
AK3WSI	RRO – AK103 (C_{25}-C_{36})	0.030 [8]	0.1	0.2	60-120 [6]	60-120	50-150	
Solid Matrix Samples – No Extract Clean-up – Microwave Extraction – 10 g to 1 mL								
DIESMI	DRO – NWTPH-Dext (C_{12}-C_{24})	1.35	2.5	5	62-119	50-150	50-150	≤ 40
DIESMI	DRO – NWTPH-Dext Jet A	2.22 [11]	2.5	5	60 – 130 [8]	50-150	50-150	
AK2SMI	DRO – AK102 (C_{10}-C_{25})	2.43	2.5	5	75-125 [6]	60-120	50-150	
OILSMI	RRO – NWTPH-Dext (C_{24}-C_{38})	2.48	5	10	62-119	50-150	50-150	
AK3SMI	RRO – AK103 (C_{25}-C_{36})	0.665 [9]	5	10	60-120 [6]	60-120	50-150	
Solid Matrix Samples – With Acid and/or Silica Gel Clean-up – Microwave Extraction – 10 g to 1 mL								
DIESMI	DRO – NWTPH-Dext (C_{12}-C_{24})	1.28	2.5	5	60-108	50-150	50-150	≤ 40
AK2SMI	DRO – AK102 (C_{10}-C_{25})	2.06	2.5	5	75-125 [6]	60-120	50-150	
OILSMI	RRO – NWTPH-Dext (C_{24}-C_{38})	1.57	5	10	60-108	50-150	50-150	
AK3SMI	RRO – AK103 (C_{25}-C_{36})	0.665 [10]	5	10	60-120 [6]	60-120	50-150	

(1) DL (Detection Limit) and LOD (Limit of Detection) as defined in ARI SOP 1018S.
(2) Limit of Quantitation as defined in ARI SOP 1018S. The spike concentration used to determine the DL and the concentration of the lowest standard used to calibrate the GC-FID instrument.
(3) All surrogate recovery limits are specified in the published methods (AK102, AK103 & NWTPH-Dext). The surrogate standard is *o*-Terphenyl.
(4) Acceptance criteria for the relative percent difference (RPD) between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$
(5) DRO = Diesel Range Organics and RRO = Residual Range Organics as defined in the methods referenced in footnote 3.
(6) Method specified LCS acceptance limits.
(7) Method specified reporting limits
(8) Default LCS control limits pending calculation of historic limits
(9) MDL study QD55 completed 2/12/10
(10) MDL study QD35 completed 1/29/10
(11) LOD Study UI44 completed 2/28/12

Quality Control Parameters for Metals Analysis using ICP-MS

Analyte	Mass	Aqueous Samples[2]			Spike Recovery		RPD[4]	Solids[3]
		DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS		LOQ[1] mg/kg
Aluminum	27	1.601	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Antimony	121	0.010	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
	123	0.011	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Arsenic #1	75	0.048	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Arsenic #2	75	0.092	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Barium	135	0.020	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	137	0.019	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Beryllium	9	0.021	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Cadmium	111	0.010	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
	114	0.005	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
Calcium	43	3.983	25	**50.0**	75 – 125	80 – 120	≤ 20	**50.0**
Chromium	52	0.045	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	53	0.118	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Cobalt	59	0.011	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Copper	63	0.158	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	65	0.236	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Iron	54	5.753	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
	57	3.876	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Lead	208	0.046	0.05	**0.1**	75 – 125	80 – 120	≤ 20	**0.1**
Magnesium	24	0.297	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Manganese	55	0.022	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Molybdenum	98	0.013	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Nickel	60	0.079	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	62	0.089	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
Potassium	39	2.944	10	**20.0**	75 – 125	80 – 120	≤ 20	**20.0**
Selenium	82	0.127	0.25	**0.5**	75 – 125	80 – 120	≤ 20	**0.5**
	78	0.324	0.25	**2.0**	75 – 125	80 – 120	≤ 20	**2.0**
Silver	107	0.008	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Sodium	23	2.833	50	**100.0**	75 – 125	80 – 120	≤ 20	**100.0**
Thorium[5]	232	0.013	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Thallium	205	0.004	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Uranium[5]	238	0.003	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Vanadium	51	0.043	0.1	**0.2**	75 – 125	80 – 120	≤ 20	**0.2**
Zinc	66	0.497	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**
	67	0.531	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**
	68	0.524	2	**4.0**	75 – 125	80 – 120	≤ 20	**4.0**

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 50 mL sample and 50 mL final volume
(3) Solids LOQ based on 100% solids using 1.0 g sample with 100 mL final volume.
(4) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then $RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$

(5) ARI has no accreditation for these elements.

Quality Control Parameters for Mercury Analysis using CVAA

	Aqueous Samples[2]			Spike Recovery		RPD[5]
	DL[1] µg/L	LOD[1] µg/L	LOQ[1] µg/L	Matrix Spike	LCS	
Mercury	0.0069	0.05	**0.10**[2]	75 – 125	80 – 120	≤ 20
Mercury (low level)	0.0026	0.01	**0.02**[3]	75 – 125	80 – 120	≤ 20
	Soil / Sediment / Tissue[4] Samples			**Spike Recovery**		**RPD[5]**
	DL[1] mg/kg	**LOD[1] mg/kg**	**LOQ[1] mg/kg**	**Matrix Spike**	**LCS**	
Mercury	0.0021	0.0125	**0.025**[3,4]	75 – 125	80 – 120	≤ 20

(1) Detection Limit (DL), Limit of Detection Limit (LOD) and Limit of Quantitation (LOQ) as defined in ARI SOP 1018S
(2) 20 mL sample with 20 mL final volume
(3) 0.2 g sample with 50 mL final volume assuming 100% dry weight. Soil and sediment are reported on a dry weight basis.
(4) Tissue LOQ is 0.005 mg/kg as received (wet weight) based on 1 g sample with 50 mL final volume.
(5) Relative Percent Difference between analytes in replicate analyzes. If C_O and C_D are the concentrations of the original and duplicate respectively then

$$RPD = \frac{|C_O - C_D|}{\frac{C_O + C_D}{2}} x100$$

Spike Recovery Control Limits for Conventional Wet Chemistry

Effective 5/1/09

Control limits are updated periodically. Assure that you have ARI's current control limits by downloading the files at the time of use. http://www.arilabs.com/portal/downloads/ARI-CLs.zip

	ARI's Control Limits	
Sample Matrix:	Water	Soil / Sediment
Matrix Spike Recoveries	% Recovery	% Recovery
Ammonia	75 - 125	75 - 125
Bromide	75 125	75 - 125
Chloride	75 125	75 - 125
Cyanide	75 - 125	75 - 125
Ferrous Iron	75 - 125	75 - 125
Fluoride	75 - 125	75 - 125
Formaldehyde	75 - 125	75 - 125
Hexane Extractable Material	-- - --	78 - 114
Hexavalent Chromium	75 - 125	75 - 125
Nitrate/Nitrite	75 - 125	75 - 125
Oil and Grease	75 - 125	75 - 125
Phenol	75 - 125	75 - 125
Phosphorous	75 - 125	75 - 125
Sulfate	75 - 125	75 - 125
Sulfide	75 - 125	75 - 125
Total Kjeldahl Nitrogen	75 - 125	75 - 125
Total Organic Carbon	75 - 125	75 - 125
Duplicate RPDs		
Acidity	±20%	±20%
Alkalinity	±20%	±20%
BOD	±20%	±20%
Cation Exchange	±20%	±20%
COD	±20%	±20%
Conductivity	±20%	±20%
Salinity	±20%	±20%
Solids	±20%	±20%
Turbidity	±20%	±20%

Semivolatile Analysis
Report and Summary QC Forms

ARI Job ID: UU16

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: 401A/DP**
Page 1 of 1 **SAMPLE**

Lab Sample ID: UU16A
LIMS ID: 12-8723
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/12/12 16:58
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.6 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 45.1%

CAS Number	Analyte	MDL	RL	Result
108-95-2	**Phenol**	**8.1**	**19**	**18 J**
541-73-1	1,3-Dichlorobenzene	2.5	19	< 19 U
106-46-7	1,4-Dichlorobenzene	2.7	19	< 19 U
100-51-6	**Benzyl Alcohol**	**5.7**	**19**	**39**
95-50-1	1,2-Dichlorobenzene	2.3	19	< 19 U
95-48-7	2-Methylphenol	4.9	19	< 19 U
106-44-5	**4-Methylphenol**	**6.2**	**38**	**39**
67-72-1	Hexachloroethane	2.8	19	< 19 U
105-67-9	2,4-Dimethylphenol	3.2	38	< 38 U
65-85-0	Benzoic Acid	95	380	< 380 U
120-82-1	1,2,4-Trichlorobenzene	3.3	19	< 19 U
91-20-3	**Naphthalene**	**2.6**	**19**	**81**
87-68-3	Hexachlorobutadiene	4.3	94	< 94 U
91-57-6	**2-Methylnaphthalene**	**2.9**	**19**	**25**
131-11-3	Dimethylphthalate	2.7	19	< 19 U
208-96-8	**Acenaphthylene**	**5.4**	**19**	**15 J**
83-32-9	**Acenaphthene**	**3.1**	**19**	**33**
132-64-9	**Dibenzofuran**	**3.8**	**19**	**10 J**
84-66-2	Diethylphthalate	34	47	< 47 U
86-73-7	**Fluorene**	**4.1**	**19**	**22**
86-30-6	N-Nitrosodiphenylamine	5.1	19	< 19 U
118-74-1	Hexachlorobenzene	4.0	19	< 19 U
87-86-5	Pentachlorophenol	46	190	< 190 U
85-01-8	**Phenanthrene**	**3.4**	**19**	**140**
120-12-7	**Anthracene**	**4.2**	**19**	**29**
84-74-2	Di-n-Butylphthalate	7.7	19	< 19 U
206-44-0	**Fluoranthene**	**2.7**	**19**	**180**
129-00-0	**Pyrene**	**1.8**	**19**	**210**
85-68-7	Butylbenzylphthalate	5.8	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**3.1**	**19**	**75**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**14**	**24**	**84 B**
218-01-9	**Chrysene**	**3.5**	**19**	**95**
117-84-0	Di-n-Octyl phthalate	5.5	19	< 19 U
50-32-8	**Benzo(a)pyrene**	**5.1**	**19**	**110**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**4.4**	**19**	**68**
53-70-3	**Dibenz(a,h)anthracene**	**4.0**	**19**	**20**
191-24-2	**Benzo(g,h,i)perylene**	**4.1**	**19**	**90**
90-12-0	**1-Methylnaphthalene**	**2.5**	**19**	**10 J**
TOTBFA	**Total Benzofluoranthenes**	**2.6**	**19**	**150**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	72.4%	2-Fluorobiphenyl	77.6%
d14-p-Terphenyl	83.0%	d4-1,2-Dichlorobenzene	65.4%
d5-Phenol	69.9%	2-Fluorophenol	68.8%
2,4,6-Tribromophenol	83.3%	d4-2-Chlorophenol	70.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: 401B/DP**
Page 1 of 1 **SAMPLE**

Lab Sample ID: UU16B
LIMS ID: 12-8724
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/12/12 17:36
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.8 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 35.0%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	8.0	19	< 19 U
541-73-1	1,3-Dichlorobenzene	2.4	19	< 19 U
106-46-7	1,4-Dichlorobenzene	2.7	19	< 19 U
100-51-6	**Benzyl Alcohol**	**5.6**	**19**	**25**
95-50-1	1,2-Dichlorobenzene	2.3	19	< 19 U
95-48-7	2-Methylphenol	4.9	19	< 19 U
106-44-5	**4-Methylphenol**	**6.2**	**37**	**130**
67-72-1	Hexachloroethane	2.7	19	< 19 U
105-67-9	2,4-Dimethylphenol	3.2	37	< 37 U
65-85-0	Benzoic Acid	94	370	< 370 U
120-82-1	1,2,4-Trichlorobenzene	3.2	19	< 19 U
91-20-3	**Naphthalene**	**2.6**	**19**	**390**
87-68-3	Hexachlorobutadiene	4.2	93	< 93 U
91-57-6	**2-Methylnaphthalene**	**2.8**	**19**	**140**
131-11-3	Dimethylphthalate	2.7	19	< 19 U
208-96-8	**Acenaphthylene**	**5.3**	**19**	**24**
83-32-9	**Acenaphthene**	**3.0**	**19**	**180**
132-64-9	**Dibenzofuran**	**3.8**	**19**	**54**
84-66-2	Diethylphthalate	34	46	< 46 U
86-73-7	**Fluorene**	**4.0**	**19**	**87**
86-30-6	N-Nitrosodiphenylamine	5.0	19	< 19 U
118-74-1	Hexachlorobenzene	4.0	19	< 19 U
87-86-5	Pentachlorophenol	45	190	< 190 U
85-01-8	**Phenanthrene**	**3.4**	**19**	**640**
120-12-7	**Anthracene**	**4.2**	**19**	**82**
84-74-2	Di-n-Butylphthalate	7.6	19	< 19 U
206-44-0	**Fluoranthene**	**2.7**	**19**	**480**
129-00-0	**Pyrene**	**1.8**	**19**	**490**
85-68-7	Butylbenzylphthalate	5.7	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**3.1**	**19**	**150**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**14**	**23**	**50 B**
218-01-9	**Chrysene**	**3.5**	**19**	**210**
117-84-0	Di-n-Octyl phthalate	5.4	19	< 19 U
50-32-8	**Benzo(a)pyrene**	**5.1**	**19**	**180**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**4.3**	**19**	**96**
53-70-3	**Dibenz(a,h)anthracene**	**4.0**	**19**	**26**
191-24-2	**Benzo(g,h,i)perylene**	**4.1**	**19**	**130**
90-12-0	**1-Methylnaphthalene**	**2.5**	**19**	**58**
TOTBFA	**Total Benzofluoranthenes**	**2.6**	**19**	**230**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	73.6%	2-Fluorobiphenyl	80.6%
d14-p-Terphenyl	87.6%	d4-1,2-Dichlorobenzene	69.4%
d5-Phenol	73.5%	2-Fluorophenol	73.3%
2,4,6-Tribromophenol	90.5%	d4-2-Chlorophenol	76.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: 401C/DP
SAMPLE

Lab Sample ID: UU16C
LIMS ID: 12-8725
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/12/12 18:13
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.8 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 52.4%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	8.0	19	< 19 U
541-73-1	1,3-Dichlorobenzene	2.4	19	< 19 U
106-46-7	1,4-Dichlorobenzene	2.7	19	< 19 U
100-51-6	**Benzyl Alcohol**	**5.7**	**19**	**98**
95-50-1	1,2-Dichlorobenzene	2.3	19	< 19 U
95-48-7	2-Methylphenol	4.9	19	< 19 U
106-44-5	**4-Methylphenol**	**6.2**	**37**	**37**
67-72-1	Hexachloroethane	2.7	19	< 19 U
105-67-9	2,4-Dimethylphenol	3.2	37	< 37 U
65-85-0	**Benzoic Acid**	**94**	**370**	**190 J**
120-82-1	1,2,4-Trichlorobenzene	3.2	19	< 19 U
91-20-3	**Naphthalene**	**2.6**	**19**	**36**
87-68-3	Hexachlorobutadiene	4.3	93	< 93 U
91-57-6	**2-Methylnaphthalene**	**2.8**	**19**	**10 J**
131-11-3	Dimethylphthalate	2.7	19	< 19 U
208-96-8	**Acenaphthylene**	**5.3**	**19**	**14 J**
83-32-9	**Acenaphthene**	**3.1**	**19**	**15 J**
132-64-9	Dibenzofuran	3.8	19	< 19 U
84-66-2	Diethylphthalate	34	46	< 46 U
86-73-7	**Fluorene**	**4.0**	**19**	**17 J**
86-30-6	N-Nitrosodiphenylamine	5.0	19	< 19 U
118-74-1	Hexachlorobenzene	4.0	19	< 19 U
87-86-5	Pentachlorophenol	45	190	< 190 U
85-01-8	**Phenanthrene**	**3.4**	**19**	**86**
120-12-7	**Anthracene**	**4.2**	**19**	**29**
84-74-2	Di-n-Butylphthalate	7.6	19	< 19 U
206-44-0	**Fluoranthene**	**2.7**	**19**	**230**
129-00-0	**Pyrene**	**1.8**	**19**	**210**
85-68-7	**Butylbenzylphthalate**	**5.7**	**19**	**17 J**
56-55-3	**Benzo(a)anthracene**	**3.1**	**19**	**91**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**14**	**23**	**110 B**
218-01-9	**Chrysene**	**3.5**	**19**	**140**
117-84-0	Di-n-Octyl phthalate	5.4	19	< 19 U
50-32-8	**Benzo(a)pyrene**	**5.1**	**19**	**130**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**4.4**	**19**	**67**
53-70-3	**Dibenz(a,h)anthracene**	**4.0**	**19**	**21**
191-24-2	**Benzo(g,h,i)perylene**	**4.1**	**19**	**78**
90-12-0	1-Methylnaphthalene	2.5	19	< 19 U
TOTBFA	**Total Benzofluoranthenes**	**2.6**	**19**	**250**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	74.0%	2-Fluorobiphenyl	78.4%
d14-p-Terphenyl	82.2%	d4-1,2-Dichlorobenzene	66.8%
d5-Phenol	72.3%	2-Fluorophenol	70.5%
2,4,6-Tribromophenol	87.5%	d4-2-Chlorophenol	75.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: 401A/NSM**
Page 1 of 1 **SAMPLE**

Lab Sample ID: UU16D
LIMS ID: 12-8726
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/12/12 18:50
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.9 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 24.8%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	7.9	18	< 18 U
541-73-1	1,3-Dichlorobenzene	2.4	18	< 18 U
106-46-7	1,4-Dichlorobenzene	2.6	18	< 18 U
100-51-6	Benzyl Alcohol	5.6	18	< 18 U
95-50-1	1,2-Dichlorobenzene	2.3	18	< 18 U
95-48-7	2-Methylphenol	4.8	18	< 18 U
106-44-5	**4-Methylphenol**	**6.1**	**37**	**67**
67-72-1	Hexachloroethane	2.7	18	< 18 U
105-67-9	2,4-Dimethylphenol	3.2	37	< 37 U
65-85-0	Benzoic Acid	92	370	< 370 U
120-82-1	1,2,4-Trichlorobenzene	3.2	18	< 18 U
91-20-3	**Naphthalene**	**2.5**	**18**	**190**
87-68-3	Hexachlorobutadiene	4.2	92	< 92 U
91-57-6	**2-Methylnaphthalene**	**2.8**	**18**	**71**
131-11-3	Dimethylphthalate	2.7	18	< 18 U
208-96-8	**Acenaphthylene**	**5.2**	**18**	**26**
83-32-9	**Acenaphthene**	**3.0**	**18**	**54**
132-64-9	**Dibenzofuran**	**3.8**	**18**	**23**
84-66-2	Diethylphthalate	33	46	< 46 U
86-73-7	**Fluorene**	**4.0**	**18**	**47**
86-30-6	N-Nitrosodiphenylamine	4.9	18	< 18 U
118-74-1	Hexachlorobenzene	3.9	18	< 18 U
87-86-5	Pentachlorophenol	44	180	< 180 U
85-01-8	**Phenanthrene**	**3.3**	**18**	**390**
120-12-7	**Anthracene**	**4.1**	**18**	**70**
84-74-2	Di-n-Butylphthalate	7.5	18	< 18 U
206-44-0	**Fluoranthene**	**2.7**	**18**	**400**
129-00-0	**Pyrene**	**1.8**	**18**	**510**
85-68-7	Butylbenzylphthalate	5.6	18	< 18 U
56-55-3	**Benzo(a)anthracene**	**3.0**	**18**	**140**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**13**	**23**	**47 B**
218-01-9	**Chrysene**	**3.4**	**18**	**190**
117-84-0	Di-n-Octyl phthalate	5.3	18	< 18 U
50-32-8	**Benzo(a)pyrene**	**5.0**	**18**	**200**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**4.3**	**18**	**110**
53-70-3	**Dibenz(a,h)anthracene**	**3.9**	**18**	**26**
191-24-2	**Benzo(g,h,i)perylene**	**4.0**	**18**	**150**
90-12-0	**1-Methylnaphthalene**	**2.5**	**18**	**25**
TOTBFA	**Total Benzofluoranthenes**	**2.5**	**18**	**250**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	72.6%	2-Fluorobiphenyl	78.4%
d14-p-Terphenyl	92.2%	d4-1,2-Dichlorobenzene	68.0%
d5-Phenol	68.9%	2-Fluorophenol	71.2%
2,4,6-Tribromophenol	89.1%	d4-2-Chlorophenol	74.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: 401B/NSM
SAMPLE

Lab Sample ID: UU16E
LIMS ID: 12-8727
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/12/12 19:26
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.6 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 19.6%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	8.2	19	< 19 U
541-73-1	1,3-Dichlorobenzene	2.5	19	< 19 U
106-46-7	1,4-Dichlorobenzene	2.7	19	< 19 U
100-51-6	Benzyl Alcohol	5.8	19	< 19 U
95-50-1	1,2-Dichlorobenzene	2.4	19	< 19 U
95-48-7	2-Methylphenol	5.0	19	< 19 U
106-44-5	4-Methylphenol	6.3	38	< 38 U
67-72-1	Hexachloroethane	2.8	19	< 19 U
105-67-9	2,4-Dimethylphenol	3.3	38	< 38 U
65-85-0	Benzoic Acid	96	380	< 380 U
120-82-1	1,2,4-Trichlorobenzene	3.3	19	< 19 U
91-20-3	Naphthalene	2.6	19	< 19 U
87-68-3	Hexachlorobutadiene	4.3	95	< 95 U
91-57-6	2-Methylnaphthalene	2.9	19	< 19 U
131-11-3	Dimethylphthalate	2.7	19	< 19 U
208-96-8	Acenaphthylene	5.4	19	< 19 U
83-32-9	Acenaphthene	3.1	19	< 19 U
132-64-9	Dibenzofuran	3.9	19	< 19 U
84-66-2	Diethylphthalate	35	47	< 47 U
86-73-7	Fluorene	4.1	19	< 19 U
86-30-6	N-Nitrosodiphenylamine	5.1	19	< 19 U
118-74-1	Hexachlorobenzene	4.1	19	< 19 U
87-86-5	Pentachlorophenol	46	190	< 190 U
85-01-8	Phenanthrene	3.4	19	< 19 U
120-12-7	Anthracene	4.3	19	< 19 U
84-74-2	Di-n-Butylphthalate	7.7	19	< 19 U
206-44-0	Fluoranthene	2.8	19	< 19 U
129-00-0	Pyrene	1.8	19	< 19 U
85-68-7	Butylbenzylphthalate	5.8	19	< 19 U
56-55-3	Benzo(a)anthracene	3.1	19	< 19 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**14**	**24**	**33 B**
218-01-9	Chrysene	3.6	19	< 19 U
117-84-0	Di-n-Octyl phthalate	5.5	19	< 19 U
50-32-8	Benzo(a)pyrene	5.2	19	< 19 U
193-39-5	Indeno(1,2,3-cd)pyrene	4.4	19	< 19 U
53-70-3	Dibenz(a,h)anthracene	4.1	19	< 19 U
191-24-2	Benzo(g,h,i)perylene	4.2	19	< 19 U
90-12-0	1-Methylnaphthalene	2.5	19	< 19 U
TOTBFA	Total Benzofluoranthenes	2.6	19	< 19 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	68.0%	2-Fluorobiphenyl	65.0%
d14-p-Terphenyl	85.8%	d4-1,2-Dichlorobenzene	66.4%
d5-Phenol	59.6%	2-Fluorophenol	66.4%
2,4,6-Tribromophenol	78.7%	d4-2-Chlorophenol	67.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: 401C/NSM**
Page 1 of 1 **SAMPLE**

Lab Sample ID: UU16F
LIMS ID: 12-8728
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/12/12 21:18
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.5 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 44.8%

CAS Number	Analyte	MDL	RL	Result
108-95-2	**Phenol**	**8.2**	**19**	**43**
541-73-1	1,3-Dichlorobenzene	2.5	19	< 19 U
106-46-7	1,4-Dichlorobenzene	2.7	19	< 19 U
100-51-6	**Benzyl Alcohol**	**5.8**	**19**	**190**
95-50-1	1,2-Dichlorobenzene	2.4	19	< 19 U
95-48-7	2-Methylphenol	5.0	19	< 19 U
106-44-5	**4-Methylphenol**	**6.3**	**38**	**110**
67-72-1	Hexachloroethane	2.8	19	< 19 U
105-67-9	2,4-Dimethylphenol	3.3	38	< 38 U
65-85-0	**Benzoic Acid**	**96**	**380**	**330 J**
120-82-1	1,2,4-Trichlorobenzene	3.3	19	< 19 U
91-20-3	**Naphthalene**	**2.6**	**19**	**170**
87-68-3	Hexachlorobutadiene	4.3	95	< 95 U
91-57-6	**2-Methylnaphthalene**	**2.9**	**19**	**44**
131-11-3	Dimethylphthalate	2.8	19	< 19 U
208-96-8	**Acenaphthylene**	**5.4**	**19**	**28**
83-32-9	**Acenaphthene**	**3.1**	**19**	**99**
132-64-9	**Dibenzofuran**	**3.9**	**19**	**31**
84-66-2	Diethylphthalate	35	48	< 48 U
86-73-7	**Fluorene**	**4.1**	**19**	**84**
86-30-6	N-Nitrosodiphenylamine	5.1	19	< 19 U
118-74-1	Hexachlorobenzene	4.1	19	< 19 U
87-86-5	Pentachlorophenol	46	190	< 190 U
85-01-8	**Phenanthrene**	**3.5**	**19**	**340**
120-12-7	**Anthracene**	**4.3**	**19**	**62**
84-74-2	Di-n-Butylphthalate	7.7	19	< 19 U
206-44-0	**Fluoranthene**	**2.8**	**19**	**310**
129-00-0	**Pyrene**	**1.8**	**19**	**300**
85-68-7	Butylbenzylphthalate	5.8	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**3.1**	**19**	**140**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**14**	**24**	**68 B**
218-01-9	**Chrysene**	**3.6**	**19**	**160**
117-84-0	Di-n-Octyl phthalate	5.5	19	< 19 U
50-32-8	**Benzo(a)pyrene**	**5.2**	**19**	**210**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**4.4**	**19**	**100**
53-70-3	**Dibenz(a,h)anthracene**	**4.1**	**19**	**30**
191-24-2	**Benzo(g,h,i)perylene**	**4.2**	**19**	**120**
90-12-0	**1-Methylnaphthalene**	**2.5**	**19**	**24**
TOTBFA	**Total Benzofluoranthenes**	**2.6**	**19**	**300**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	69.6%	2-Fluorobiphenyl	77.2%
d14-p-Terphenyl	83.0%	d4-1,2-Dichlorobenzene	64.2%
d5-Phenol	72.5%	2-Fluorophenol	69.5%
2,4,6-Tribromophenol	82.5%	d4-2-Chlorophenol	73.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: 410A/DP
SAMPLE

Lab Sample ID: UU16G
LIMS ID: 12-8729
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/12/12 21:55
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.5 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 44.1%

CAS Number	Analyte	MDL	RL	Result
108-95-2	**Phenol**	**8.2**	**19**	**30 M**
541-73-1	1,3-Dichlorobenzene	2.5	19	< 19 U
106-46-7	1,4-Dichlorobenzene	2.7	19	< 19 U
100-51-6	**Benzyl Alcohol**	**5.8**	**19**	**73**
95-50-1	1,2-Dichlorobenzene	2.4	19	< 19 U
95-48-7	2-Methylphenol	5.0	19	< 19 U
106-44-5	**4-Methylphenol**	**6.3**	**38**	**14 J**
67-72-1	Hexachloroethane	2.8	19	< 19 U
105-67-9	2,4-Dimethylphenol	3.3	38	< 38 U
65-85-0	**Benzoic Acid**	**96**	**380**	**110 J**
120-82-1	1,2,4-Trichlorobenzene	3.3	19	< 19 U
91-20-3	**Naphthalene**	**2.6**	**19**	**34**
87-68-3	Hexachlorobutadiene	4.4	95	< 95 U
91-57-6	**2-Methylnaphthalene**	**2.9**	**19**	**11 J**
131-11-3	Dimethylphthalate	2.8	19	< 19 U
208-96-8	Acenaphthylene	5.4	19	< 19 U
83-32-9	**Acenaphthene**	**3.1**	**19**	**49**
132-64-9	Dibenzofuran	3.9	19	< 19 U
84-66-2	Diethylphthalate	35	48	< 48 U
86-73-7	**Fluorene**	**4.1**	**19**	**19**
86-30-6	N-Nitrosodiphenylamine	5.1	19	< 19 U
118-74-1	Hexachlorobenzene	4.1	19	< 19 U
87-86-5	Pentachlorophenol	46	190	< 190 U
85-01-8	**Phenanthrene**	**3.5**	**19**	**86**
120-12-7	**Anthracene**	**4.3**	**19**	**23**
84-74-2	Di-n-Butylphthalate	7.8	19	< 19 U
206-44-0	**Fluoranthene**	**2.8**	**19**	**140**
129-00-0	**Pyrene**	**1.8**	**19**	**140**
85-68-7	Butylbenzylphthalate	5.8	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**3.1**	**19**	**57**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**14**	**24**	**62 B**
218-01-9	**Chrysene**	**3.6**	**19**	**72**
117-84-0	Di-n-Octyl phthalate	5.6	19	< 19 U
50-32-8	**Benzo(a)pyrene**	**5.2**	**19**	**86**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**4.5**	**19**	**41**
53-70-3	**Dibenz(a,h)anthracene**	**4.1**	**19**	**13 J**
191-24-2	**Benzo(g,h,i)perylene**	**4.2**	**19**	**48**
90-12-0	1-Methylnaphthalene	2.6	19	< 19 U
TOTBFA	**Total Benzofluoranthenes**	**2.6**	**19**	**120**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	73.6%	2-Fluorobiphenyl	79.6%
d14-p-Terphenyl	85.8%	d4-1,2-Dichlorobenzene	67.6%
d5-Phenol	72.5%	2-Fluorophenol	70.7%
2,4,6-Tribromophenol	87.1%	d4-2-Chlorophenol	75.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: 410B/DP
SAMPLE

Lab Sample ID: UU16H
LIMS ID: 12-8730
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/12/12 22:32
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.3 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 27.4%

CAS Number	Analyte	MDL	RL	Result
108-95-2	**Phenol**	**8.4**	**20**	**11 J**
541-73-1	1,3-Dichlorobenzene	2.6	20	< 20 U
106-46-7	1,4-Dichlorobenzene	2.8	20	< 20 U
100-51-6	**Benzyl Alcohol**	**5.9**	**20**	**20**
95-50-1	1,2-Dichlorobenzene	2.4	20	< 20 U
95-48-7	2-Methylphenol	5.1	20	< 20 U
106-44-5	4-Methylphenol	6.5	39	< 39 U
67-72-1	Hexachloroethane	2.9	20	< 20 U
105-67-9	2,4-Dimethylphenol	3.4	39	< 39 U
65-85-0	Benzoic Acid	98	390	< 390 U
120-82-1	1,2,4-Trichlorobenzene	3.4	20	< 20 U
91-20-3	**Naphthalene**	**2.7**	**20**	**37**
87-68-3	Hexachlorobutadiene	4.4	97	< 97 U
91-57-6	**2-Methylnaphthalene**	**3.0**	**20**	**16 J**
131-11-3	Dimethylphthalate	2.8	20	< 20 U
208-96-8	Acenaphthylene	5.6	20	< 20 U
83-32-9	**Acenaphthene**	**3.2**	**20**	**27**
132-64-9	**Dibenzofuran**	**4.0**	**20**	**12 J**
84-66-2	Diethylphthalate	36	49	< 49 U
86-73-7	**Fluorene**	**4.2**	**20**	**23**
86-30-6	N-Nitrosodiphenylamine	5.2	20	< 20 U
118-74-1	Hexachlorobenzene	4.2	20	< 20 U
87-86-5	Pentachlorophenol	47	200	< 200 U
85-01-8	**Phenanthrene**	**3.5**	**20**	**120**
120-12-7	**Anthracene**	**4.4**	**20**	**32**
84-74-2	Di-n-Butylphthalate	7.9	20	< 20 U
206-44-0	**Fluoranthene**	**2.8**	**20**	**170**
129-00-0	**Pyrene**	**1.9**	**20**	**170**
85-68-7	Butylbenzylphthalate	6.0	20	< 20 U
56-55-3	**Benzo(a)anthracene**	**3.2**	**20**	**66**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**14**	**24**	**68 B**
218-01-9	**Chrysene**	**3.7**	**20**	**84**
117-84-0	Di-n-Octyl phthalate	5.7	20	< 20 U
50-32-8	**Benzo(a)pyrene**	**5.3**	**20**	**83**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**4.6**	**20**	**41**
53-70-3	**Dibenz(a,h)anthracene**	**4.2**	**20**	**15 J**
191-24-2	**Benzo(g,h,i)perylene**	**4.3**	**20**	**45**
90-12-0	1-Methylnaphthalene	2.6	20	< 20 U
TOTBFA	**Total Benzofluoranthenes**	**2.7**	**20**	**130**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	74.2%	2-Fluorobiphenyl	79.2%
d14-p-Terphenyl	89.6%	d4-1,2-Dichlorobenzene	69.4%
d5-Phenol	71.1%	2-Fluorophenol	72.4%
2,4,6-Tribromophenol	90.4%	d4-2-Chlorophenol	75.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: 410C/DP**
Page 1 of 1 **SAMPLE**

Lab Sample ID: UU16I
LIMS ID: 12-8731
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/12/12 23:09
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.9 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 33.9%

CAS Number	Analyte	MDL	RL	Result
108-95-2	**Phenol**	**7.9**	**18**	**20 M**
541-73-1	1,3-Dichlorobenzene	2.4	18	< 18 U
106-46-7	1,4-Dichlorobenzene	2.6	18	< 18 U
100-51-6	**Benzyl Alcohol**	**5.6**	**18**	**25**
95-50-1	1,2-Dichlorobenzene	2.3	18	< 18 U
95-48-7	2-Methylphenol	4.8	18	< 18 U
106-44-5	**4-Methylphenol**	**6.1**	**37**	**26 J**
67-72-1	Hexachloroethane	2.7	18	< 18 U
105-67-9	2,4-Dimethylphenol	3.2	37	< 37 U
65-85-0	Benzoic Acid	93	370	< 370 U
120-82-1	1,2,4-Trichlorobenzene	3.2	18	< 18 U
91-20-3	**Naphthalene**	**2.5**	**18**	**140**
87-68-3	Hexachlorobutadiene	4.2	92	< 92 U
91-57-6	**2-Methylnaphthalene**	**2.8**	**18**	**67**
131-11-3	Dimethylphthalate	2.7	18	< 18 U
208-96-8	**Acenaphthylene**	**5.2**	**18**	**42**
83-32-9	**Acenaphthene**	**3.0**	**18**	**270**
132-64-9	**Dibenzofuran**	**3.8**	**18**	**61**
84-66-2	Diethylphthalate	34	46	< 46 U
86-73-7	**Fluorene**	**4.0**	**18**	**160**
86-30-6	N-Nitrosodiphenylamine	4.9	18	< 18 U
118-74-1	Hexachlorobenzene	3.9	18	< 18 U
87-86-5	Pentachlorophenol	44	180	< 180 U
85-01-8	**Phenanthrene**	**3.3**	**18**	**1,600**
120-12-7	**Anthracene**	**4.1**	**18**	**320**
84-74-2	Di-n-Butylphthalate	7.5	18	< 18 U
206-44-0	**Fluoranthene**	**2.7**	**18**	**5,700 E**
129-00-0	**Pyrene**	**1.8**	**18**	**5,200 E**
85-68-7	Butylbenzylphthalate	5.6	18	< 18 U
56-55-3	**Benzo(a)anthracene**	**3.0**	**18**	**3,200 E**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**13**	**23**	**86 B**
218-01-9	**Chrysene**	**3.4**	**18**	**3,900 E**
117-84-0	**Di-n-Octyl phthalate**	**5.4**	**18**	**12 J**
50-32-8	**Benzo(a)pyrene**	**5.0**	**18**	**4,000 E**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**4.3**	**18**	**1,500**
53-70-3	**Dibenz(a,h)anthracene**	**4.0**	**18**	**600**
191-24-2	**Benzo(g,h,i)perylene**	**4.0**	**18**	**1,400**
90-12-0	**1-Methylnaphthalene**	**2.5**	**18**	**36**
TOTBFA	**Total Benzofluoranthenes**	**2.5**	**18**	**6,700 E**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	68.2%	2-Fluorobiphenyl	75.6%
d14-p-Terphenyl	85.8%	d4-1,2-Dichlorobenzene	63.6%
d5-Phenol	67.9%	2-Fluorophenol	65.5%
2,4,6-Tribromophenol	87.6%	d4-2-Chlorophenol	71.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: 410C/DP DILUTION

Lab Sample ID: UU16I
LIMS ID: 12-8731
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 13:22
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.9 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 10.0
Percent Moisture: 33.9%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	79	180	< 180 U
541-73-1	1,3-Dichlorobenzene	24	180	< 180 U
106-46-7	1,4-Dichlorobenzene	26	180	< 180 U
100-51-6	Benzyl Alcohol	56	180	< 180 U
95-50-1	1,2-Dichlorobenzene	23	180	< 180 U
95-48-7	2-Methylphenol	48	180	< 180 U
106-44-5	4-Methylphenol	61	370	< 370 U
67-72-1	Hexachloroethane	27	180	< 180 U
105-67-9	2,4-Dimethylphenol	32	370	< 370 U
65-85-0	Benzoic Acid	930	3,700	< 3,700 U
120-82-1	1,2,4-Trichlorobenzene	32	180	< 180 U
91-20-3	**Naphthalene**	**25**	**180**	**140 J**
87-68-3	Hexachlorobutadiene	42	920	< 920 U
91-57-6	2-Methylnaphthalene	28	180	< 180 U
131-11-3	Dimethylphthalate	27	180	< 180 U
208-96-8	Acenaphthylene	52	180	< 180 U
83-32-9	**Acenaphthene**	**30**	**180**	**260**
132-64-9	Dibenzofuran	38	180	< 180 U
84-66-2	Diethylphthalate	340	460	< 460 U
86-73-7	**Fluorene**	**40**	**180**	**140 J**
86-30-6	N-Nitrosodiphenylamine	49	180	< 180 U
118-74-1	Hexachlorobenzene	39	180	< 180 U
87-86-5	Pentachlorophenol	440	1,800	< 1,800 U
85-01-8	**Phenanthrene**	**33**	**180**	**1,600**
120-12-7	**Anthracene**	**41**	**180**	**310**
84-74-2	Di-n-Butylphthalate	75	180	< 180 U
206-44-0	**Fluoranthene**	**27**	**180**	**5,900**
129-00-0	**Pyrene**	**18**	**180**	**5,000**
85-68-7	Butylbenzylphthalate	56	180	< 180 U
56-55-3	**Benzo(a)anthracene**	**30**	**180**	**3,200**
117-81-7	bis(2-Ethylhexyl)phthalate	130	230	< 230 U
218-01-9	**Chrysene**	**34**	**180**	**3,800**
117-84-0	Di-n-Octyl phthalate	54	180	< 180 U
50-32-8	**Benzo(a)pyrene**	**50**	**180**	**3,900**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**43**	**180**	**2,300**
53-70-3	**Dibenz(a,h)anthracene**	**40**	**180**	**940**
191-24-2	**Benzo(g,h,i)perylene**	**40**	**180**	**2,500**
90-12-0	1-Methylnaphthalene	25	180	< 180 U
TOTBFA	**Total Benzofluoranthenes**	**25**	**180**	**6,200**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	56.0%	2-Fluorobiphenyl	64.0%
d14-p-Terphenyl	84.0%	d4-1,2-Dichlorobenzene	60.0%
d5-Phenol	42.7%	2-Fluorophenol	60.0%
2,4,6-Tribromophenol	61.3%	d4-2-Chlorophenol	52.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: 410A/NSM
SAMPLE

Lab Sample ID: UU16J
LIMS ID: 12-8732
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/12/12 23:46
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.4 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 40.4%

CAS Number	Analyte	MDL	RL	Result
108-95-2	**Phenol**	**8.3**	**19**	**24 M**
541-73-1	1,3-Dichlorobenzene	2.5	19	< 19 U
106-46-7	1,4-Dichlorobenzene	2.7	19	< 19 U
100-51-6	**Benzyl Alcohol**	**5.8**	**19**	**68**
95-50-1	1,2-Dichlorobenzene	2.4	19	< 19 U
95-48-7	2-Methylphenol	5.0	19	< 19 U
106-44-5	**4-Methylphenol**	**6.3**	**38**	**110**
67-72-1	Hexachloroethane	2.8	19	< 19 U
105-67-9	2,4-Dimethylphenol	3.3	38	< 38 U
65-85-0	**Benzoic Acid**	**97**	**380**	**120 J**
120-82-1	1,2,4-Trichlorobenzene	3.3	19	< 19 U
91-20-3	**Naphthalene**	**2.6**	**19**	**510**
87-68-3	Hexachlorobutadiene	4.4	96	< 96 U
91-57-6	**2-Methylnaphthalene**	**2.9**	**19**	**210**
131-11-3	Dimethylphthalate	2.8	19	< 19 U
208-96-8	**Acenaphthylene**	**5.5**	**19**	**29**
83-32-9	**Acenaphthene**	**3.1**	**19**	**460**
132-64-9	**Dibenzofuran**	**3.9**	**19**	**94**
84-66-2	Diethylphthalate	35	48	< 48 U
86-73-7	**Fluorene**	**4.2**	**19**	**120**
86-30-6	N-Nitrosodiphenylamine	5.2	19	< 19 U
118-74-1	Hexachlorobenzene	4.1	19	< 19 U
87-86-5	Pentachlorophenol	46	190	< 190 U
85-01-8	**Phenanthrene**	**3.5**	**19**	**1,000**
120-12-7	**Anthracene**	**4.3**	**19**	**100**
84-74-2	Di-n-Butylphthalate	7.8	19	< 19 U
206-44-0	**Fluoranthene**	**2.8**	**19**	**600**
129-00-0	**Pyrene**	**1.9**	**19**	**580**
85-68-7	Butylbenzylphthalate	5.9	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**3.1**	**19**	**160**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**14**	**24**	**65 B**
218-01-9	**Chrysene**	**3.6**	**19**	**190**
117-84-0	Di-n-Octyl phthalate	5.6	19	< 19 U
50-32-8	**Benzo(a)pyrene**	**5.2**	**19**	**170**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**4.5**	**19**	**65**
53-70-3	**Dibenz(a,h)anthracene**	**4.1**	**19**	**19**
191-24-2	**Benzo(g,h,i)perylene**	**4.2**	**19**	**74**
90-12-0	**1-Methylnaphthalene**	**2.6**	**19**	**68**
TOTBFA	**Total Benzofluoranthenes**	**2.6**	**19**	**260**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	73.4%	2-Fluorobiphenyl	83.6%
d14-p-Terphenyl	92.0%	d4-1,2-Dichlorobenzene	70.2%
d5-Phenol	75.1%	2-Fluorophenol	72.8%
2,4,6-Tribromophenol	93.9%	d4-2-Chlorophenol	86.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: 410B/NSM**
Page 1 of 1 **SAMPLE**

Lab Sample ID: UU16K
LIMS ID: 12-8733
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/13/12 00:23
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.8 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 25.7%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	8.0	19	< 19 U
541-73-1	1,3-Dichlorobenzene	2.4	19	< 19 U
106-46-7	1,4-Dichlorobenzene	2.7	19	< 19 U
100-51-6	Benzyl Alcohol	5.6	19	< 19 U
95-50-1	1,2-Dichlorobenzene	2.3	19	< 19 U
95-48-7	2-Methylphenol	4.9	19	< 19 U
106-44-5	**4-Methylphenol**	**6.2**	**37**	**9.3 J**
67-72-1	Hexachloroethane	2.7	19	< 19 U
105-67-9	2,4-Dimethylphenol	3.2	37	< 37 U
65-85-0	Benzoic Acid	94	370	< 370 U
120-82-1	1,2,4-Trichlorobenzene	3.2	19	< 19 U
91-20-3	**Naphthalene**	**2.6**	**19**	**47**
87-68-3	Hexachlorobutadiene	4.2	93	< 93 U
91-57-6	**2-Methylnaphthalene**	**2.8**	**19**	**21**
131-11-3	Dimethylphthalate	2.7	19	< 19 U
208-96-8	**Acenaphthylene**	**5.3**	**19**	**9.3 J**
83-32-9	**Acenaphthene**	**3.0**	**19**	**83**
132-64-9	**Dibenzofuran**	**3.8**	**19**	**18 J**
84-66-2	Diethylphthalate	34	46	< 46 U
86-73-7	**Fluorene**	**4.0**	**19**	**40**
86-30-6	N-Nitrosodiphenylamine	5.0	19	< 19 U
118-74-1	Hexachlorobenzene	4.0	19	< 19 U
87-86-5	Pentachlorophenol	45	190	< 190 U
85-01-8	**Phenanthrene**	**3.4**	**19**	**270**
120-12-7	**Anthracene**	**4.2**	**19**	**60**
84-74-2	Di-n-Butylphthalate	7.6	19	< 19 U
206-44-0	**Fluoranthene**	**2.7**	**19**	**500**
129-00-0	**Pyrene**	**1.8**	**19**	**450**
85-68-7	Butylbenzylphthalate	5.7	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**3.1**	**19**	**280**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**14**	**23**	**44 B**
218-01-9	**Chrysene**	**3.5**	**19**	**320**
117-84-0	Di-n-Octyl phthalate	5.4	19	< 19 U
50-32-8	**Benzo(a)pyrene**	**5.1**	**19**	**400**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**4.3**	**19**	**160**
53-70-3	**Dibenz(a,h)anthracene**	**4.0**	**19**	**58**
191-24-2	**Benzo(g,h,i)perylene**	**4.1**	**19**	**160**
90-12-0	1-Methylnaphthalene	2.5	19	< 19 U
TOTBFA	**Total Benzofluoranthenes**	**2.6**	**19**	**640**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	72.4%	2-Fluorobiphenyl	76.4%
d14-p-Terphenyl	87.6%	d4-1,2-Dichlorobenzene	69.2%
d5-Phenol	65.5%	2-Fluorophenol	70.9%
2,4,6-Tribromophenol	88.8%	d4-2-Chlorophenol	79.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: 410C/NSM**
Page 1 of 1 **SAMPLE**

Lab Sample ID: UU16L
LIMS ID: 12-8734
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/13/12 01:00
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.4 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 31.7%

CAS Number	Analyte	MDL	RL	Result
108-95-2	**Phenol**	**8.3**	**19**	**28 M**
541-73-1	1,3-Dichlorobenzene	2.5	19	< 19 U
106-46-7	1,4-Dichlorobenzene	2.8	19	< 19 U
100-51-6	**Benzyl Alcohol**	**5.9**	**19**	**12 J**
95-50-1	1,2-Dichlorobenzene	2.4	19	< 19 U
95-48-7	2-Methylphenol	5.1	19	< 19 U
106-44-5	**4-Methylphenol**	**6.4**	**39**	**34 J**
67-72-1	Hexachloroethane	2.8	19	< 19 U
105-67-9	2,4-Dimethylphenol	3.3	39	< 39 U
65-85-0	Benzoic Acid	97	390	< 390 U
120-82-1	1,2,4-Trichlorobenzene	3.4	19	< 19 U
91-20-3	**Naphthalene**	**2.7**	**19**	**150**
87-68-3	Hexachlorobutadiene	4.4	96	< 96 U
91-57-6	**2-Methylnaphthalene**	**3.0**	**19**	**88**
131-11-3	Dimethylphthalate	2.8	19	< 19 U
208-96-8	**Acenaphthylene**	**5.5**	**19**	**36**
83-32-9	**Acenaphthene**	**3.2**	**19**	**190**
132-64-9	**Dibenzofuran**	**4.0**	**19**	**62**
84-66-2	Diethylphthalate	35	48	< 48 U
86-73-7	**Fluorene**	**4.2**	**19**	**120**
86-30-6	**N-Nitrosodiphenylamine**	**5.2**	**19**	**30**
118-74-1	Hexachlorobenzene	4.1	19	< 19 U
87-86-5	Pentachlorophenol	47	190	< 190 U
85-01-8	**Phenanthrene**	**3.5**	**19**	**940**
120-12-7	**Anthracene**	**4.3**	**19**	**160**
84-74-2	Di-n-Butylphthalate	7.9	19	< 19 U
206-44-0	**Fluoranthene**	**2.8**	**19**	**1,400**
129-00-0	**Pyrene**	**1.9**	**19**	**1,200**
85-68-7	Butylbenzylphthalate	5.9	19	< 19 U
56-55-3	**Benzo(a)anthracene**	**3.2**	**19**	**560**
117-81-7	**bis(2-Ethylhexyl)phthalate**	**14**	**24**	**110 B**
218-01-9	**Chrysene**	**3.6**	**19**	**760**
117-84-0	Di-n-Octyl phthalate	5.6	19	< 19 U
50-32-8	**Benzo(a)pyrene**	**5.3**	**19**	**720**
193-39-5	**Indeno(1,2,3-cd)pyrene**	**4.5**	**19**	**260**
53-70-3	**Dibenz(a,h)anthracene**	**4.2**	**19**	**110**
191-24-2	**Benzo(g,h,i)perylene**	**4.2**	**19**	**250**
90-12-0	**1-Methylnaphthalene**	**2.6**	**19**	**36**
TOTBFA	**Total Benzofluoranthenes**	**2.7**	**19**	**1,300**

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	74.0%	2-Fluorobiphenyl	81.6%
d14-p-Terphenyl	87.0%	d4-1,2-Dichlorobenzene	72.4%
d5-Phenol	70.4%	2-Fluorophenol	72.8%
2,4,6-Tribromophenol	86.9%	d4-2-Chlorophenol	76.1%

ANALYTICAL RESOURCES INCORPORATED

SW8270 SEMIVOLATILES SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00

Client ID	NBZ	FBP	TPH	DCB	PHL	2FP	TBP	2CP	TOT OUT
401A/DP	72.4%	77.6%	83.0%	65.4%	69.9%	68.8%	83.3%	70.5%	0
401B/DP	73.6%	80.6%	87.6%	69.4%	73.5%	73.3%	90.5%	76.0%	0
401C/DP	74.0%	78.4%	82.2%	66.8%	72.3%	70.5%	87.5%	75.7%	0
401A/NSM	72.6%	78.4%	92.2%	68.0%	68.9%	71.2%	89.1%	74.8%	0
MB-051212	71.8%	71.2%	91.4%	67.4%	67.3%	70.1%	71.2%	77.6%	0
LCS-051212	70.0%	72.4%	94.2%	64.2%	73.2%	70.3%	81.5%	72.3%	0
LCSD-051212	76.8%	76.2%	93.4%	70.8%	78.7%	76.3%	81.5%	77.2%	0
401B/NSM	68.0%	65.0%	85.8%	66.4%	59.6%	66.4%	78.7%	67.1%	0
401B/NSM MS	70.6%	75.8%	92.4%	65.2%	71.5%	71.2%	85.1%	71.9%	0
401B/NSM MSD	72.0%	78.0%	88.0%	67.4%	73.7%	72.0%	82.0%	73.7%	0
401C/NSM	69.6%	77.2%	83.0%	64.2%	72.5%	69.5%	82.5%	73.9%	0
410A/DP	73.6%	79.6%	85.8%	67.6%	72.5%	70.7%	87.1%	75.6%	0
410B/DP	74.2%	79.2%	89.6%	69.4%	71.1%	72.4%	90.4%	75.2%	0
410C/DP	68.2%	75.6%	85.8%	63.6%	67.9%	65.5%	87.6%	71.1%	0
410C/DP DL	56.0%	64.0%	84.0%	60.0%	42.7%	60.0%	61.3%	52.0%	0
410A/NSM	73.4%	83.6%	92.0%	70.2%	75.1%	72.8%	93.9%	86.0%	0
410B/NSM	72.4%	76.4%	87.6%	69.2%	65.5%	70.9%	88.8%	79.2%	0
410C/NSM	74.0%	81.6%	87.0%	72.4%	70.4%	72.8%	86.9%	76.1%	0

	LCS/MB LIMITS	QC LIMITS
(NBZ) = d5-Nitrobenzene	(30-160)	(30-160)
(FBP) = 2-Fluorobiphenyl	(30-160)	(30-160)
(TPH) = d14-p-Terphenyl	(30-160)	(30-160)
(DCB) = d4-1,2-Dichlorobenzene	(30-160)	(30-160)
(PHL) = d5-Phenol	(30-160)	(30-160)
(2FP) = 2-Fluorophenol	(30-160)	(30-160)
(TBP) = 2,4,6-Tribromophenol	(30-160)	(30-160)
(2CP) = d4-2-Chlorophenol	(30-160)	(30-160)

Prep Method: SW3546
Log Number Range: 12-8723 to 12-8734

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: 401B/NSM
MS/MSD

Lab Sample ID: UU16E
LIMS ID: 12-8727
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted MS/MSD: 05/12/12

Date Analyzed MS: 05/12/12 20:03
MSD: 05/12/12 20:41
Instrument/Analyst MS: NT10/YZ
MSD: NT10/YZ
GPC Cleanup: No

Sample Amount MS: 11.0 g-dry-wt
MSD: 10.5 g-dry-wt
Final Extract Volume MS: 1.0 mL
MSD: 1.0 mL
Dilution Factor MS: 1.00
MSD: 1.00
Percent Moisture: 19.6 %

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Phenol	< 18.9 U	297	455	65.3%	328	476	68.9%	9.9%
1,3-Dichlorobenzene	< 18.9 U	285	455	62.6%	323	476	67.9%	12.5%
1,4-Dichlorobenzene	< 18.9 U	292	455	64.2%	321	476	67.4%	9.5%
Benzyl Alcohol	< 18.9 U	309	455	67.9%	351	476	73.7%	12.7%
1,2-Dichlorobenzene	< 18.9 U	298	455	65.5%	331	476	69.5%	10.5%
2-Methylphenol	< 18.9 U	267	455	58.7%	282	476	59.2%	5.5%
4-Methylphenol	< 37.9 U	544	910	59.8%	582	951	61.2%	6.7%
Hexachloroethane	< 18.9 U	213	455	46.8%	250	476	52.5%	16.0%
2,4-Dimethylphenol	< 37.9 U	934	1360	68.7%	851	1430	59.5%	9.3%
Benzoic Acid	< 379 U	977	2500	39.1%	745	2620	28.4%	26.9%
1,2,4-Trichlorobenzene	< 18.9 U	301	455	66.2%	322	476	67.6%	6.7%
Naphthalene	< 18.9 U	335	455	73.6%	365	476	76.7%	8.6%
Hexachlorobutadiene	< 94.7 U	304	455	66.8%	323	476	67.9%	6.1%
2-Methylnaphthalene	< 18.9 U	345	455	75.8%	366	476	76.9%	5.9%
Dimethylphthalate	< 18.9 U	417	455	91.6%	456	476	95.8%	8.9%
Acenaphthylene	< 18.9 U	384	455	84.4%	449	476	94.3%	15.6%
Acenaphthene	< 18.9 U	398	455	87.5%	428	476	89.9%	7.3%
Dibenzofuran	< 18.9 U	371	455	81.5%	413	476	86.8%	10.7%
Diethylphthalate	< 47.3 U	450	455	98.9%	474	476	99.6%	5.2%
Fluorene	< 18.9 U	434	455	95.4%	476	476	100%	9.2%
N-Nitrosodiphenylamine	< 18.9 U	427	455	93.8%	428	476	89.9%	0.2%
Hexachlorobenzene	< 18.9 U	389	455	85.5%	418	476	87.8%	7.2%
Pentachlorophenol	< 189 U	998 Q	1360	73.4%	1050 Q	1430	73.4%	5.1%
Phenanthrene	< 18.9 U	456	455	100%	498	476	105%	8.8%
Anthracene	< 18.9 U	439	455	96.5%	465	476	97.7%	5.8%
Di-n-Butylphthalate	< 18.9 U	510	455	112%	529	476	111%	3.7%
Fluoranthene	< 18.9 U	498	455	109%	520	476	109%	4.3%
Pyrene	< 18.9 U	443	455	97.4%	461	476	96.8%	4.0%
Butylbenzylphthalate	< 18.9 U	497	455	109%	507	476	107%	2.0%
Benzo(a)anthracene	< 18.9 U	455	455	100%	459	476	96.4%	0.9%
bis(2-Ethylhexyl)phthalate	33.1 B	486 B	455	99.5%	500 B	476	98.1%	2.8%
Chrysene	< 18.9 U	468	455	103%	466	476	97.9%	0.4%
Di-n-Octyl phthalate	< 18.9 U	459	455	101%	480	476	101%	4.5%
Benzo(a)pyrene	< 18.9 U	453	455	99.6%	451	476	94.7%	0.4%
Indeno(1,2,3-cd)pyrene	< 18.9 U	403	455	88.6%	438	476	92.0%	8.3%
Dibenz(a,h)anthracene	< 18.9 U	386	455	84.8%	525	476	110%	30.5%
Benzo(g,h,i)perylene	< 18.9 U	379	455	83.3%	408	476	85.7%	7.4%
1-Methylnaphthalene	< 18.9 U	334	455	73.4%	357	476	75.0%	6.7%
Total Benzofluoranthenes	< 18.9 U	912	910	100%	947	951	99.6%	3.8%

Reported in µg/kg (ppb)
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS **Sample ID: 401B/NSM**
Page 1 of 1 **MATRIX SPIKE**

Lab Sample ID: UU16E
LIMS ID: 12-8727
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/12/12 20:03
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 11.0 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 19.6%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	7.9	18	---
541-73-1	1,3-Dichlorobenzene	2.4	18	---
106-46-7	1,4-Dichlorobenzene	2.6	18	---
100-51-6	Benzyl Alcohol	5.5	18	---
95-50-1	1,2-Dichlorobenzene	2.3	18	---
95-48-7	2-Methylphenol	4.8	18	---
106-44-5	4-Methylphenol	6.0	36	---
67-72-1	Hexachloroethane	2.7	18	---
105-67-9	2,4-Dimethylphenol	3.1	36	---
65-85-0	Benzoic Acid	92	360	---
120-82-1	1,2,4-Trichlorobenzene	3.2	18	---
91-20-3	Naphthalene	2.5	18	---
87-68-3	Hexachlorobutadiene	4.2	91	---
91-57-6	2-Methylnaphthalene	2.8	18	---
131-11-3	Dimethylphthalate	2.6	18	---
208-96-8	Acenaphthylene	5.2	18	---
83-32-9	Acenaphthene	3.0	18	---
132-64-9	Dibenzofuran	3.7	18	---
84-66-2	Diethylphthalate	33	46	---
86-73-7	Fluorene	4.0	18	---
86-30-6	N-Nitrosodiphenylamine	4.9	18	---
118-74-1	Hexachlorobenzene	3.9	18	---
87-86-5	Pentachlorophenol	44	180	---
85-01-8	Phenanthrene	3.3	18	---
120-12-7	Anthracene	4.1	18	---
84-74-2	Di-n-Butylphthalate	7.4	18	---
206-44-0	Fluoranthene	2.6	18	---
129-00-0	Pyrene	1.8	18	---
85-68-7	Butylbenzylphthalate	5.6	18	---
56-55-3	Benzo(a)anthracene	3.0	18	---
117-81-7	bis(2-Ethylhexyl)phthalate	13	23	---
218-01-9	Chrysene	3.4	18	---
117-84-0	Di-n-Octyl phthalate	5.3	18	---
50-32-8	Benzo(a)pyrene	5.0	18	---
193-39-5	Indeno(1,2,3-cd)pyrene	4.3	18	---
53-70-3	Dibenz(a,h)anthracene	3.9	18	---
191-24-2	Benzo(g,h,i)perylene	4.0	18	---
90-12-0	1-Methylnaphthalene	2.4	18	---
TOTBFA	Total Benzofluoranthenes	2.5	18	---

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	70.6%	2-Fluorobiphenyl	75.8%
d14-p-Terphenyl	92.4%	d4-1,2-Dichlorobenzene	65.2%
d5-Phenol	71.5%	2-Fluorophenol	71.2%
2,4,6-Tribromophenol	85.1%	d4-2-Chlorophenol	71.9%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: 401B/NSM
MATRIX SPIKE DUPLICATE

Lab Sample ID: UU16E
LIMS ID: 12-8727
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/12/12 20:41
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.5 g-dry-wt
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: 19.6%

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	8.2	19	---
541-73-1	1,3-Dichlorobenzene	2.5	19	---
106-46-7	1,4-Dichlorobenzene	2.7	19	---
100-51-6	Benzyl Alcohol	5.8	19	---
95-50-1	1,2-Dichlorobenzene	2.4	19	---
95-48-7	2-Methylphenol	5.0	19	---
106-44-5	4-Methylphenol	6.3	38	---
67-72-1	Hexachloroethane	2.8	19	---
105-67-9	2,4-Dimethylphenol	3.3	38	---
65-85-0	Benzoic Acid	96	380	---
120-82-1	1,2,4-Trichlorobenzene	3.3	19	---
91-20-3	Naphthalene	2.6	19	---
87-68-3	Hexachlorobutadiene	4.3	95	---
91-57-6	2-Methylnaphthalene	2.9	19	---
131-11-3	Dimethylphthalate	2.8	19	---
208-96-8	Acenaphthylene	5.4	19	---
83-32-9	Acenaphthene	3.1	19	---
132-64-9	Dibenzofuran	3.9	19	---
84-66-2	Diethylphthalate	35	48	---
86-73-7	Fluorene	4.1	19	---
86-30-6	N-Nitrosodiphenylamine	5.1	19	---
118-74-1	Hexachlorobenzene	4.1	19	---
87-86-5	Pentachlorophenol	46	190	---
85-01-8	Phenanthrene	3.5	19	---
120-12-7	Anthracene	4.3	19	---
84-74-2	Di-n-Butylphthalate	7.8	19	---
206-44-0	Fluoranthene	2.8	19	---
129-00-0	Pyrene	1.8	19	---
85-68-7	Butylbenzylphthalate	5.8	19	---
56-55-3	Benzo(a)anthracene	3.1	19	---
117-81-7	bis(2-Ethylhexyl)phthalate	14	24	---
218-01-9	Chrysene	3.6	19	---
117-84-0	Di-n-Octyl phthalate	5.6	19	---
50-32-8	Benzo(a)pyrene	5.2	19	---
193-39-5	Indeno(1,2,3-cd)pyrene	4.5	19	---
53-70-3	Dibenz(a,h)anthracene	4.1	19	---
191-24-2	Benzo(g,h,i)perylene	4.2	19	---
90-12-0	1-Methylnaphthalene	2.5	19	---
TOTBFA	Total Benzofluoranthenes	2.6	19	---

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	72.0%	2-Fluorobiphenyl	78.0%
d14-p-Terphenyl	88.0%	d4-1,2-Dichlorobenzene	67.4%
d5-Phenol	73.7%	2-Fluorophenol	72.0%
2,4,6-Tribromophenol	82.0%	d4-2-Chlorophenol	73.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: LCS-051212
LCS/LCSD

Lab Sample ID: LCS-051212
LIMS ID: 12-8727
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted LCS/LCSD: 05/12/12

Sample Amount LCS: 10.0 g
LCSD: 10.0 g

Date Analyzed LCS: 05/12/12 15:44
LCSD: 05/12/12 16:21

Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL

Instrument/Analyst LCS: NT10/YZ
LCSD: NT10/YZ

Dilution Factor LCS: 1.00
LCSD: 1.00

GPC Cleanup: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Phenol	322	500	64.4%	366	500	73.2%	12.8%
1,3-Dichlorobenzene	299	500	59.8%	350	500	70.0%	15.7%
1,4-Dichlorobenzene	301	500	60.2%	354	500	70.8%	16.2%
Benzyl Alcohol	353	500	70.6%	397	500	79.4%	11.7%
1,2-Dichlorobenzene	310	500	62.0%	364	500	72.8%	16.0%
2-Methylphenol	278	500	55.6%	309	500	61.8%	10.6%
4-Methylphenol	587	1000	58.7%	646	1000	64.6%	9.6%
Hexachloroethane	306	500	61.2%	361	500	72.2%	16.5%
2,4-Dimethylphenol	880	1500	58.7%	967	1500	64.5%	9.4%
Benzoic Acid	1600	2750	58.2%	1480	2750	53.8%	7.8%
1,2,4-Trichlorobenzene	308	500	61.6%	357	500	71.4%	14.7%
Naphthalene	343	500	68.6%	394	500	78.8%	13.8%
Hexachlorobutadiene	303	500	60.6%	356	500	71.2%	16.1%
2-Methylnaphthalene	342	500	68.4%	395	500	79.0%	14.4%
Dimethylphthalate	437	500	87.4%	463	500	92.6%	5.8%
Acenaphthylene	388	500	77.6%	420	500	84.0%	7.9%
Acenaphthene	398	500	79.6%	435	500	87.0%	8.9%
Dibenzofuran	387	500	77.4%	415	500	83.0%	7.0%
Diethylphthalate	478	500	95.6%	515	500	103%	7.5%
Fluorene	444	500	88.8%	488	500	97.6%	9.4%
N-Nitrosodiphenylamine	434	500	86.8%	458	500	91.6%	5.4%
Hexachlorobenzene	401	500	80.2%	434	500	86.8%	7.9%
Pentachlorophenol	1090 Q	1500	72.7%	1140 Q	1500	76.0%	4.5%
Phenanthrene	484	500	96.8%	518	500	104%	6.8%
Anthracene	452	500	90.4%	471	500	94.2%	4.1%
Di-n-Butylphthalate	539	500	108%	570	500	114%	5.6%
Fluoranthene	513	500	103%	551	500	110%	7.1%
Pyrene	478	500	95.6%	498	500	99.6%	4.1%
Butylbenzylphthalate	524	500	105%	550	500	110%	4.8%
Benzo(a)anthracene	474	500	94.8%	500	500	100%	5.3%
bis(2-Ethylhexyl)phthalate	512 B	500	102%	559 B	500	112%	8.8%
Chrysene	492	500	98.4%	509	500	102%	3.4%
Di-n-Octyl phthalate	494	500	98.8%	529	500	106%	6.8%
Benzo(a)pyrene	459	500	91.8%	466	500	93.2%	1.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS

Sample ID: LCSD-051212
LCS/LCSD

Lab Sample ID: LCS-051212
LIMS ID: 12-8727
Matrix: Sediment
Date Analyzed LCS: 05/12/12 15:44
LCSD: 05/12/12 16:21

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Indeno(1,2,3-cd)pyrene	474	500	94.8%	502	500	100%	5.7%
Dibenz(a,h)anthracene	472	500	94.4%	508	500	102%	7.3%
Benzo(g,h,i)perylene	482	500	96.4%	506	500	101%	4.9%
1-Methylnaphthalene	334	500	66.8%	381	500	76.2%	13.1%
Total Benzofluoranthenes	964	1000	96.4%	1030	1000	103%	6.6%

Semivolatile Surrogate Recovery

	LCS	LCSD
d5-Nitrobenzene	70.0%	76.8%
2-Fluorobiphenyl	72.4%	76.2%
d14-p-Terphenyl	94.2%	93.4%
d4-1,2-Dichlorobenzene	64.2%	70.8%
d5-Phenol	73.2%	78.7%
2-Fluorophenol	70.3%	76.3%
2,4,6-Tribromophenol	81.5%	81.5%
d4-2-Chlorophenol	72.3%	77.2%

Reported in µg/kg (ppb)
RPD calculated using sample concentrations per SW846.

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

UU16MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UU16

Project: P.O.P. T4 MAINTENANC

Lab File ID: UU16MB

Date Extracted: 05/12/12

Instrument ID: NT10

Date Analyzed: 05/12/12

Matrix: SOLID

Time Analyzed: 1507

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	UU16LCSS1	UU16LCSS1	UU16SB	05/12/12
02	UU16LCSDS1	UU16LCSDS1	UU16SBD	05/12/12
03	401A/DP	UU16A	UU16A	05/12/12
04	401B/DP	UU16B	UU16B	05/12/12
05	401C/DP	UU16C	UU16C	05/12/12
06	401A/NSM	UU16D	UU16D	05/12/12
07	401B/NSM	UU16E	UU16E	05/12/12
08	401B/NSM MS	UU16EMS	UU16EMS	05/12/12
09	401B/NSM MSD	UU16EMSD	UU16EMSD	05/12/12
10	401C/NSM	UU16F	UU16F	05/12/12
11	410A/DP	UU16G	UU16G	05/12/12
12	410B/DP	UU16H	UU16H	05/12/12
13	410C/DP	UU16I	UU16I	05/12/12
14	410A/NSM	UU16J	UU16J	05/12/12
15	410B/NSM	UU16K	UU16K	05/13/12
16	410C/NSM	UU16L	UU16L	05/13/12
17	410C/DP	UU16I	UU16I10	05/14/12
18				
19				
20				
21				
22				
23				
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27				
28				
29				
30				

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Semivolatiles by SW8270D GC/MS
Page 1 of 1

Sample ID: MB-051212
METHOD BLANK

Lab Sample ID: MB-051212
LIMS ID: 12-8727
Matrix: Sediment
Data Release Authorized:
Reported: 05/14/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: NA
Date Received: NA

Date Extracted: 05/12/12
Date Analyzed: 05/12/12 15:07
Instrument/Analyst: NT10/YZ
GPC Cleanup: No

Sample Amount: 10.0 g
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
108-95-2	Phenol	8.6	20	< 20 U
541-73-1	1,3-Dichlorobenzene	2.6	20	< 20 U
106-46-7	1,4-Dichlorobenzene	2.9	20	< 20 U
100-51-6	Benzyl Alcohol	6.1	20	< 20 U
95-50-1	1,2-Dichlorobenzene	2.5	20	< 20 U
95-48-7	2-Methylphenol	5.2	20	< 20 U
106-44-5	4-Methylphenol	6.6	40	< 40 U
67-72-1	Hexachloroethane	2.9	20	< 20 U
105-67-9	2,4-Dimethylphenol	3.5	40	< 40 U
65-85-0	Benzoic Acid	100	400	< 400 U
120-82-1	1,2,4-Trichlorobenzene	3.5	20	< 20 U
91-20-3	Naphthalene	2.8	20	< 20 U
87-68-3	Hexachlorobutadiene	4.6	100	< 100 U
91-57-6	2-Methylnaphthalene	3.1	20	< 20 U
131-11-3	Dimethylphthalate	2.9	20	< 20 U
208-96-8	Acenaphthylene	5.7	20	< 20 U
83-32-9	Acenaphthene	3.3	20	< 20 U
132-64-9	Dibenzofuran	4.1	20	< 20 U
84-66-2	Diethylphthalate	37	50	< 50 U
86-73-7	Fluorene	4.4	20	< 20 U
86-30-6	N-Nitrosodiphenylamine	5.4	20	< 20 U
118-74-1	Hexachlorobenzene	4.3	20	< 20 U
87-86-5	Pentachlorophenol	48	200	< 200 U
85-01-8	Phenanthrene	3.6	20	< 20 U
120-12-7	Anthracene	4.5	20	< 20 U
84-74-2	Di-n-Butylphthalate	8.2	20	< 20 U
206-44-0	Fluoranthene	2.9	20	< 20 U
129-00-0	Pyrene	1.9	20	< 20 U
85-68-7	Butylbenzylphthalate	6.1	20	< 20 U
56-55-3	Benzo(a)anthracene	3.3	20	< 20 U
117-81-7	**bis(2-Ethylhexyl)phthalate**	**15**	**25**	**19 J**
218-01-9	Chrysene	3.8	20	< 20 U
117-84-0	Di-n-Octyl phthalate	5.8	20	< 20 U
50-32-8	Benzo(a)pyrene	5.4	20	< 20 U
193-39-5	Indeno(1,2,3-cd)pyrene	4.7	20	< 20 U
53-70-3	Dibenz(a,h)anthracene	4.3	20	< 20 U
191-24-2	Benzo(g,h,i)perylene	4.4	20	< 20 U
90-12-0	1-Methylnaphthalene	2.7	20	< 20 U
TOTBFA	Total Benzofluoranthenes	2.8	20	< 20 U

Reported in µg/kg (ppb)

Semivolatile Surrogate Recovery

d5-Nitrobenzene	71.8%	2-Fluorobiphenyl	71.2%
d14-p-Terphenyl	91.4%	d4-1,2-Dichlorobenzene	67.4%
d5-Phenol	67.3%	2-Fluorophenol	70.1%
2,4,6-Tribromophenol	71.2%	d4-2-Chlorophenol	77.6%

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

Instrument ID: NT10 Project: P.O.P. T4 MAINTENANCE

DFTPP Injection Date: 05/07/12 DFTPP Injection Time: 1408

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	24.5
68	Less than 2.0% of mass 69	0.6 (1.4)1
69	Mass 69 relative abundance	39.2
70	Less than 2.0% of mass 69	0.2 (0.4)1
127	10.0 - 80.0% of mass 198	47.6
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.8
275	10.0 - 60.0% of mass 198	26.3
365	Greater than 1.0% of mass 198	3.43
441	0.0 - 24.0% of mass 442	13.1 (15.5)2
442	50.0 - 200.0% of mass 198	84.2
443	15.0 - 24.0% of mass 442	17.0 (20.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		IC05075	IC0507A	05/07/12	1423
02		IC050720	IC0507B	05/07/12	1500
03		IC05070.2	IC0507C	05/07/12	1537
04		IC05071	IC0507D	05/07/12	1614
05		IC05072.5	IC0507E	05/07/12	1651
06		IC050710	IC0507G	05/07/12	1805
07		IC05070.5	IC0507I	05/07/12	1919
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

Instrument ID: NT10 Project: P.O.P. T4 MAINTENANCE

DFTPP Injection Date: 05/12/12 DFTPP Injection Time: 1357

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	10.0 - 80.0% of mass 198	27.3	
68	Less than 2.0% of mass 69	0.7	(1.5)1
69	Mass 69 relative abundance	44.8	
70	Less than 2.0% of mass 69	0.2	(0.5)1
127	10.0 - 80.0% of mass 198	52.9	
197	Less than 2.0% of mass 198	0.2	
198	Base Peak, 100% relative abundance	100.0	
199	5.0 to 9.0% of mass 198	6.8	
275	10.0 - 60.0% of mass 198	24.2	
365	Greater than 1.0% of mass 198	3.31	
441	0.0 - 24.0% of mass 442	11.1	(15.8)2
442	50.0 - 200.0% of mass 198	70.3	
443	15.0 - 24.0% of mass 442	14.1	(20.0)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		CC0512	CC0512	05/12/12	1412
02	UU16MBS1	UU16MBS1	UU16MB	05/12/12	1507
03	UU16LCSS1	UU16LCSS1	UU16SB	05/12/12	1544
04	UU16LCSDS1	UU16LCSDS1	UU16SBD	05/12/12	1621
05	401A/DP	UU16A	UU16A	05/12/12	1658
06	401B/DP	UU16B	UU16B	05/12/12	1736
07	401C/DP	UU16C	UU16C	05/12/12	1813
08	401A/NSM	UU16D	UU16D	05/12/12	1850
09	401B/NSM	UU16E	UU16E	05/12/12	1926
10	401B/NSM MS	UU16EMS	UU16EMS	05/12/12	2003
11	401B/NSM MSD	UU16EMSD	UU16EMSD	05/12/12	2041
12	401C/NSM	UU16F	UU16F	05/12/12	2118
13	410A/DP	UU16G	UU16G	05/12/12	2155
14	410B/DP	UU16H	UU16H	05/12/12	2232
15	410C/DP	UU16I	UU16I	05/12/12	2309
16	410A/NSM	UU16J	UU16J	05/12/12	2346
17	410B/NSM	UU16K	UU16K	05/13/12	0023
18	410C/NSM	UU16L	UU16L	05/13/12	0100
19					
20					
21					
22					

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

Instrument ID: NT10 Project: P.O.P. T4 MAINTENANCE

DFTPP Injection Date: 05/14/12 DFTPP Injection Time: 1230

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	10.0 - 80.0% of mass 198	27.1	
68	Less than 2.0% of mass 69	0.6	(1.4)1
69	Mass 69 relative abundance	43.8	
70	Less than 2.0% of mass 69	0.2	(0.4)1
127	10.0 - 80.0% of mass 198	52.1	
197	Less than 2.0% of mass 198	0.0	
198	Base Peak, 100% relative abundance	100.0	
199	5.0 to 9.0% of mass 198	6.8	
275	10.0 - 60.0% of mass 198	24.2	
365	Greater than 1.0% of mass 198	3.24	
441	0.0 - 24.0% of mass 442	11.4	(16.0)2
442	50.0 - 200.0% of mass 198	71.3	
443	15.0 - 24.0% of mass 442	14.2	(19.9)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		CC0514	CC0514	05/14/12	1245
02	410C/DP	UU16I	UU16I10	05/14/12	1322
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM V SV

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P. T4 MAINTENANCE

Instrument ID: NT10 Calibration Date: 05/07/12

LAB FILE ID: RRF0.2=IC0507C RRF0.5=IC0507I RRF1 =IC0507D
RRF2.5=IC0507E RRF5 =IC0507A RRF10 =IC0507G
RRF20 =IC0507B

COMPOUND	RRF 0.2	RRF 0.5	RRF 1	RRF 2.5	RRF 5	RRF 10	RRF 20	___ RRF	%RSD /R^2
Phenol	1.935	1.954	1.980	1.891	1.807	1.751	1.734	1.864	5.4
1,3-Dichlorobenzene	1.779	1.736	1.756	1.645	1.597	1.507	1.488	1.644	7.2
1,4-Dichlorobenzene	1.705	1.644	1.723	1.586	1.569	1.464	1.481	1.596	6.4
1,2-Dichlorobenzene	1.621	1.677	1.607	1.566	1.525	1.424	1.426	1.549	6.3
Benzyl alcohol	0.878	0.871	0.920	0.873	0.868	0.838	0.836	0.869	3.2
2-Methylphenol	1.498	1.519	1.530	1.483	1.439	1.413	1.391	1.468	3.7
Hexachloroethane	0.620	0.656	0.653	0.627	0.607	0.591	0.604	0.622	4.0
4-Methylphenol	1.580	1.546	1.633	1.554	1.512	1.457	1.431	1.530	4.6
2,4-Dimethylphenol	0.378	0.376	0.384	0.355	0.340	0.330	0.323	0.355	7.0
1,2,4-Trichlorobenzene	0.346	0.349	0.346	0.320	0.314	0.299	0.298	0.324	7.0
Naphthalene	1.070	1.028	1.044	0.996	0.959	0.950	0.945	0.999	5.0
Benzoic acid	0.192	0.228	0.279	0.297	0.300	0.311	0.322	0.276	17.3
Hexachlorobutadiene	0.192	0.180	0.190	0.175	0.174	0.168	0.166	0.178	5.7
2-Methylnaphthalene	0.708	0.690	0.705	0.682	0.673	0.668	0.669	0.685	2.4
Acenaphthylene	1.933	1.799	1.908	1.732	1.704	1.677	1.656	1.773	6.3
Dimethylphthalate	1.369	1.250	1.336	1.212	1.166	1.114	1.096	1.220	8.6
Acenaphthene	1.120	1.087	1.119	1.038	1.015	1.011	1.016	1.058	4.7
Dibenzofuran	1.663	1.616	1.675	1.541	1.519	1.511	1.499	1.575	4.7
Fluorene	1.279	1.233	1.287	1.194	1.152	1.142	1.124	1.202	5.5
Diethylphthalate	1.250	1.217	1.262	1.155	1.134	1.089	1.071	1.168	6.5
N-Nitrosodiphenylamine (1)	0.548	0.536	0.570	0.514	0.494	0.475	0.467	0.515	7.5
Hexachlorobenzene	0.265	0.255	0.254	0.241	0.236	0.227	0.225	0.243	6.2
Pentachlorophenol	0.149	0.153	0.181	0.175	0.177	0.172	0.176	0.169	7.4
Phenanthrene	1.034	1.002	1.054	0.961	0.951	0.956	0.966	0.989	4.2
Anthracene	1.094	1.028	1.073	1.052	1.018	1.015	1.029	1.044	2.9
Di-n-butylphthalate	1.273	1.184	1.308	1.263	1.292	1.327	1.342	1.284	4.1
Fluoranthene	1.137	1.060	1.180	1.117	1.121	1.121	1.144	1.126	3.2
Pyrene	1.271	1.213	1.276	1.196	1.160	1.172	1.173	1.209	3.9
Butylbenzylphthalate	0.557	0.494	0.547	0.508	0.501	0.500	0.493	0.514	5.1
Benzo(a)anthracene	1.196	1.104	1.136	1.072	1.030	1.022	1.032	1.084	6.0
Chrysene	1.045	0.978	1.003	0.959	0.924	0.938	0.931	0.968	4.5
bis(2-Ethylhexyl)phthalate	0.552	0.538	0.547	0.512	0.489	0.507	0.495	0.520	4.9
Di-n-octylphthalate	1.073	1.003	0.999	0.931	0.883	0.896	0.879	0.952	7.8
Benzo(a)pyrene	0.990	0.955	0.999	0.953	0.951	0.971	0.983	0.972	2.0
Indeno(1,2,3-cd)pyrene	1.115	1.022	1.130	1.102	1.097	1.123	1.150	1.106	3.7
Dibenzo(a,h)anthracene	0.829	0.790	0.875	0.845	0.844	0.868	0.897	0.850	4.1
Benzo(g,h,i)perylene	0.965	0.889	1.000	0.939	0.937	0.970	0.992	0.956	4.0

(1) Cannot be seperated from Diphenylamine

<- Outside QC limits: %RSD <20% or R^2 > 0.990

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P. T4 MAINTENANCE

Instrument ID: NT10 Calibration Date: 05/07/12

LAB FILE ID: RRF0.2=IC0507C RRF0.5=IC0507I RRF1 =IC0507D
RRF2.5=IC0507E RRF5 =IC0507A RRF10 =IC0507G
RRF20 =IC0507B

COMPOUND	RRF 0.2	RRF 0.5	RRF 1	RRF 2.5	RRF 5	RRF 10	RRF 20	___ RRF	%RSD /R^2
1-methylnaphthalene	0.714	0.700	0.722	0.699	0.693	0.681	0.682	0.699	2.2
Total Benzofluoranthenes	1.153	1.098	1.140	1.072	1.045	1.057	1.052	1.088	4.0
2-Fluorophenol	1.436	1.407	1.447	1.381	1.344	1.290	1.273	1.368	5.0
Phenol-d5	1.717	1.732	1.732	1.699	1.696	1.661	1.673	1.701	1.6
2-Chlorophenol-d4	1.531	1.494	1.525	1.486	1.461	1.404	1.407	1.472	3.5
1,2-Dichlorobenzene-d4	1.083	1.035	1.042	0.998	0.967	0.924	0.934	0.998	5.9
Nitrobenzene-d5	0.356	0.348	0.362	0.342	0.326	0.334	0.325	0.342	4.2
2-Fluorobiphenyl	1.486	1.395	1.459	1.341	1.308	1.288	1.274	1.364	6.2
2,4,6-Tribromophenol	0.174	0.179	0.196	0.180	0.187	0.181	0.186	0.183	3.8
Terphenyl-d14	0.852	0.788	0.818	0.749	0.712	0.696	0.690	0.758	8.3

<- Outside QC limits: %RSD <20% or R^2 > 0.990

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P. T4 MAINTENANCE

Instrument ID: NT10 Cont. Calib. Date: 05/12/12

Init. Calib. Date: 05/07/12 Cont. Calib. Time: 1412

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
Phenol	1.864	1.700	0.800	AVRG	-8.8	
1,3-Dichlorobenzene	1.644	1.589	0.010	AVRG	-3.3	
1,4-Dichlorobenzene	1.596	1.546	0.010	AVRG	-3.1	
1,2-Dichlorobenzene	1.549	1.495	0.010	AVRG	-3.5	
Benzyl alcohol	0.869	0.728	0.010	AVRG	-16.2	
2-Methylphenol	1.468	1.378	0.700	AVRG	-6.1	
Hexachloroethane	0.622	0.631	0.300	AVRG	1.4	
4-Methylphenol	1.530	1.401	0.600	AVRG	-8.4	
2,4-Dimethylphenol	0.355	0.333	0.200	AVRG	-6.2	
1,2,4-Trichlorobenzene	0.324	0.302	0.010	AVRG	-6.8	
Naphthalene	0.999	0.955	0.700	AVRG	-4.4	
Benzoic acid	0.276	0.252	0.010	AVRG	-8.7	
Hexachlorobutadiene	0.178	0.170	0.010	AVRG	-4.5	
2-Methylnaphthalene	0.685	0.656	0.400	AVRG	-4.2	
Acenaphthylene	1.773	1.868	0.900	AVRG	5.4	
Dimethylphthalate	1.220	1.154	0.010	AVRG	-5.4	
Acenaphthene	1.058	1.020	0.900	AVRG	-3.6	
Dibenzofuran	1.575	1.478	0.800	AVRG	-6.2	
Fluorene	1.202	1.187	0.900	AVRG	-1.2	
Diethylphthalate	1.168	1.152	0.010	AVRG	-1.4	
N-Nitrosodiphenylamine(1)	0.515	0.492	0.010	AVRG	-4.5	
Hexachlorobenzene	0.243	0.219	0.100	AVRG	-9.9	
Pentachlorophenol	0.169	0.133	0.050	AVRG	-21.3	<-
Phenanthrene	0.989	0.943	0.700	AVRG	-4.6	
Anthracene	1.044	1.020	0.700	AVRG	-2.3	
Di-n-butylphthalate	1.284	1.351	0.010	AVRG	5.2	
Fluoranthene	1.126	1.103	0.600	AVRG	-2.0	
Pyrene	1.209	1.150	0.600	AVRG	-4.9	
Butylbenzylphthalate	0.514	0.538	0.010	AVRG	4.7	
Benzo(a)anthracene	1.084	1.019	0.800	AVRG	-6.0	
Chrysene	0.968	0.932	0.700	AVRG	-3.7	
bis(2-Ethylhexyl)phthalate	0.520	0.502	0.010	AVRG	-3.5	
Di-n-octylphthalate	0.952	0.884	0.010	AVRG	-7.1	
Benzo(a)pyrene	0.972	0.950	0.700	AVRG	-2.3	
Indeno(1,2,3-cd)pyrene	1.106	1.093	0.500	AVRG	-1.2	
Dibenzo(a,h)anthracene	0.850	0.860	0.400	AVRG	1.2	
Benzo(g,h,i)perylene	0.956	0.909	0.500	AVRG	-4.9	

(1) Cannot be separated from Diphenylamine

<- Exceeds QC limit of 20% D

* RF less than minimum RF

7C

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P. T4 MAINTENANCE

Instrument ID: NT10 Cont. Calib. Date: 05/12/12

Init. Calib. Date: 05/07/12 Cont. Calib. Time: 1412

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
1-methylnaphthalene	0.699	0.682	0.010	AVRG	-2.4
Total Benzofluoranthenes	1.088	1.028	0.010	AVRG	-5.5
2-Fluorophenol	1.368	1.331	0.010	AVRG	-2.7
Phenol-d5	1.701	1.610	0.010	AVRG	-5.3
2-Chlorophenol-d4	1.472	1.419	0.010	AVRG	-3.6
1,2-Dichlorobenzene-d4	0.998	0.960	0.010	AVRG	-3.8
Nitrobenzene-d5	0.342	0.325	0.010	AVRG	-5.0
2-Fluorobiphenyl	1.364	1.282	0.010	AVRG	-6.0
2,4,6-Tribromophenol	0.183	0.162	0.010	AVRG	-11.5
Terphenyl-d14	0.758	0.679	0.010	AVRG	-10.4

<- Exceeds QC limit of 20% D
* RF less than minimum RF

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P. T4 MAINTENANCE

Instrument ID: NT10 Cont. Calib. Date: 05/14/12

Init. Calib. Date: 05/07/12 Cont. Calib. Time: 1245

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
Phenol	1.864	1.724	0.800	AVRG	-7.5	
1,3-Dichlorobenzene	1.644	1.598	0.010	AVRG	-2.8	
1,4-Dichlorobenzene	1.596	1.551	0.010	AVRG	-2.8	
1,2-Dichlorobenzene	1.549	1.498	0.010	AVRG	-3.3	
Benzyl alcohol	0.869	0.766	0.010	AVRG	-11.8	
2-Methylphenol	1.468	1.349	0.700	AVRG	-8.1	
Hexachloroethane	0.622	0.627	0.300	AVRG	0.8	
4-Methylphenol	1.530	1.360	0.600	AVRG	-11.1	
2,4-Dimethylphenol	0.355	0.323	0.200	AVRG	-9.0	
1,2,4-Trichlorobenzene	0.324	0.305	0.010	AVRG	-5.9	
Naphthalene	0.999	0.960	0.700	AVRG	-3.9	
Benzoic acid	0.276	0.181	0.010	AVRG	-34.4	<-
Hexachlorobutadiene	0.178	0.167	0.010	AVRG	-6.2	
2-Methylnaphthalene	0.685	0.658	0.400	AVRG	-3.9	
Acenaphthylene	1.773	1.826	0.900	AVRG	3.0	
Dimethylphthalate	1.220	1.153	0.010	AVRG	-5.5	
Acenaphthene	1.058	1.004	0.900	AVRG	-5.1	
Dibenzofuran	1.575	1.445	0.800	AVRG	-8.2	
Fluorene	1.202	1.172	0.900	AVRG	-2.5	
Diethylphthalate	1.168	1.127	0.010	AVRG	-3.5	
N-Nitrosodiphenylamine(1)	0.515	0.484	0.010	AVRG	-6.0	
Hexachlorobenzene	0.243	0.225	0.100	AVRG	-7.4	
Pentachlorophenol	0.169	0.132	0.050	AVRG	-21.9	<-
Phenanthrene	0.989	0.936	0.700	AVRG	-5.4	
Anthracene	1.044	1.020	0.700	AVRG	-2.3	
Di-n-butylphthalate	1.284	1.371	0.010	AVRG	6.8	
Fluoranthene	1.126	1.125	0.600	AVRG	-0.1	
Pyrene	1.209	1.095	0.600	AVRG	-9.4	
Butylbenzylphthalate	0.514	0.516	0.010	AVRG	0.4	
Benzo(a)anthracene	1.084	1.003	0.800	AVRG	-7.5	
Chrysene	0.968	0.908	0.700	AVRG	-6.2	
bis(2-Ethylhexyl)phthalate	0.520	0.486	0.010	AVRG	-6.5	
Di-n-octylphthalate	0.952	0.877	0.010	AVRG	-7.9	
Benzo(a)pyrene	0.972	0.941	0.700	AVRG	-3.2	
Indeno(1,2,3-cd)pyrene	1.106	1.112	0.500	AVRG	0.5	
Dibenzo(a,h)anthracene	0.850	0.884	0.400	AVRG	4.0	
Benzo(g,h,i)perylene	0.956	0.940	0.500	AVRG	-1.7	

(1) Cannot be separated from Diphenylamine

<- Exceeds QC limit of 20% D

* RF less than minimum RF

7C

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P. T4 MAINTENANCE

Instrument ID: NT10 Cont. Calib. Date: 05/14/12

Init. Calib. Date: 05/07/12 Cont. Calib. Time: 1245

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
1-methylnaphthalene	0.699	0.684	0.010	AVRG	-2.1
Total Benzofluoranthenes	1.088	1.016	0.010	AVRG	-6.6
2-Fluorophenol	1.368	1.310	0.010	AVRG	-4.2
Phenol-d5	1.701	1.540	0.010	AVRG	-9.5
2-Chlorophenol-d4	1.472	1.396	0.010	AVRG	-5.2
1,2-Dichlorobenzene-d4	0.998	0.962	0.010	AVRG	-3.6
Nitrobenzene-d5	0.342	0.316	0.010	AVRG	-7.6
2-Fluorobiphenyl	1.364	1.252	0.010	AVRG	-8.2
2,4,6-Tribromophenol	0.183	0.154	0.010	AVRG	-15.8
Terphenyl-d14	0.758	0.653	0.010	AVRG	-13.8

<- Exceeds QC limit of 20% D
* RF less than minimum RF

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P. T4 MAINTENANCE

Ical Midpoint ID: IC0507A Ical Date: 05/07/12

Instrument ID: NT10 Cont. Cal Date: 05/12/12

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	ICAL MIDPT	271872	9.02	1080694	11.70	623821	15.60
	UPPER LIMIT	543744		2161388		1247642	
	LOWER LIMIT	135936		540347		311910	
	CCAL	211630	9.06	846583	11.73	483640	15.65
	UPPER LIMIT		9.56		12.23		16.15
	LOWER LIMIT		8.56		11.23		15.15
01	UU16MBS1	200167	9.06	765559	11.74	403599	15.65
02	UU16LCSS1	196328	9.05	789583	11.73	429365	15.64
03	UU16LCSDS1	191847	9.05	756776	11.73	417279	15.65
04	401A/DP	203562	9.05	783832	11.73	424242	15.64
05	401B/DP	198089	9.06	767143	11.73	417641	15.64
06	401C/DP	200987	9.05	783992	11.73	429596	15.64
07	401A/NSM	200740	9.06	763953	11.73	427811	15.65
08	401B/NSM	201393	9.06	762652	11.73	396485	15.65
09	401B/NSM MS	189586	9.06	735940	11.73	413159	15.65
10	401B/NSM MSD	191220	9.06	762676	11.73	413675	15.64
11	401C/NSM	199456	9.06	777120	11.73	426556	15.64
12	410A/DP	206492	9.06	811652	11.73	436846	15.64
13	410B/DP	200117	9.06	772590	11.73	422594	15.64
14	410C/DP	209726	9.06	812612	11.73	451071	15.64
15	410A/NSM	195217	9.06	762961	11.73	417862	15.65
16	410B/NSM	193308	9.06	734684	11.73	408433	15.65
17	410C/NSM	200515	9.06	778032	11.73	430204	15.65
18							
19							
20							
21							
22							
23							
24							
25							

IS1 = 1,4-Dichlorobenzene-d4
IS2 = Naphthalene-d8
IS3 = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P. T4 MAINTENANCE

Ical Midpoint ID: IC0507A Ical Date: 05/07/12

Instrument ID: NT10 Cont. Cal Date: 05/12/12

		IS4(PHN) AREA #	RT #	IS5(CRY) AREA #	RT #	IS6(PRY) AREA #	RT #
	ICAL MIDPT	999143	18.87	1001009	23.93	988348	26.40
	UPPER LIMIT	1998286		2002018		1976696	
	LOWER LIMIT	499572		500504		494174	
	CCAL	768993	18.93	774214	23.98	781228	26.46
	UPPER LIMIT		19.43		24.48		26.96
	LOWER LIMIT		18.43		23.48		25.96
01	UU16MBS1	652694	18.93	636729	23.98	625605	26.46
02	UU16LCSS1	653202	18.93	672959	23.98	671485	26.46
03	UU16LCSDS1	624922	18.92	651242	23.98	648616	26.46
04	401A/DP	672423	18.92	696718	23.98	688696	26.46
05	401B/DP	654924	18.93	690896	23.98	685875	26.46
06	401C/DP	679957	18.93	725106	23.98	682711	26.47
07	401A/NSM	672911	18.93	705306	23.99	682313	26.47
08	401B/NSM	625435	18.93	688612	23.99	661534	26.46
09	401B/NSM MS	629309	18.93	661621	23.98	659695	26.46
10	401B/NSM MSD	629873	18.93	683761	23.98	653018	26.46
11	401C/NSM	663603	18.93	720191	23.99	668285	26.46
12	410A/DP	697406	18.93	723070	23.98	673209	26.46
13	410B/DP	665015	18.93	694445	23.98	635099	26.46
14	410C/DP	722834	18.93	742319	24.00	663113	26.49
15	410A/NSM	676056	18.93	699645	23.99	617747	26.48
16	410B/NSM	669039	18.93	698747	23.99	614904	26.47
17	410C/NSM	698519	18.93	719781	24.00	605198	26.49
18							
19							
20							
21							
22							
23							
24							
25							

IS4 = Phenanthrene-d10
IS5 = Chrysene-d12
IS6 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC | Client: HART CROWSER

ARI Job No: UU16 | Project: P.O.P. T4 MAINTENANCE

Ical Midpoint ID: IC0507A | Ical Date: 05/07/12

Instrument ID: NT10 | Cont. Cal Date: 05/12/12

		IS7 AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	1489422	25.02				
	UPPER LIMIT	2978844					
	LOWER LIMIT	744711					
	CCAL	1235054	25.07				
	UPPER LIMIT		25.57				
	LOWER LIMIT		24.57				
01	UU16MBS1	982550	25.07				
02	UU16LCSS1	1042110	25.06				
03	UU16LCSDS1	978352	25.07				
04	401A/DP	1078039	25.07				
05	401B/DP	1074692	25.07				
06	401C/DP	1112884	25.07				
07	401A/NSM	1112460	25.07				
08	401B/NSM	1062392	25.06				
09	401B/NSM MS	1058736	25.06				
10	401B/NSM MSD	1056339	25.07				
11	401C/NSM	1103854	25.07				
12	410A/DP	1128169	25.06				
13	410B/DP	1089840	25.07				
14	410C/DP	1108385	25.08				
15	410A/NSM	1076668	25.07				
16	410B/NSM	1082550	25.07				
17	410C/NSM	1121891	25.08				
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23							
24							
25							

IS7 = Di-n-octylphthalate-d4

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

8B
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P. T4 MAINTENANCE

Ical Midpoint ID: IC0507A Ical Date: 05/07/12

Instrument ID: NT10 Cont. Cal Date: 05/14/12

		IS1(DCB) AREA #	RT #	IS2(NPT) AREA #	RT #	IS3(ANT) AREA #	RT #
	ICAL MIDPT	271872	9.02	1080694	11.70	623821	15.60
	UPPER LIMIT	543744		2161388		1247642	
	LOWER LIMIT	135936		540347		311910	
	CCAL	213901	9.06	849142	11.73	489775	15.65
	UPPER LIMIT		9.56		12.23		16.15
	LOWER LIMIT		8.56		11.23		15.15
01	410C/DP	199208	9.06	700833	11.73	388403	15.64
02							
03							
04							
05							
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25							

IS1 = 1,4-Dichlorobenzene-d4
IS2 = Naphthalene-d8
IS3 = Acenaphthene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P. T4 MAINTENANCE

Ical Midpoint ID: IC0507A Ical Date: 05/07/12

Instrument ID: NT10 Cont. Cal Date: 05/14/12

		IS4(PHN) AREA	#	RT	#	IS5(CRY) AREA	#	RT	#	IS6(PRY) AREA	#	RT	#
	ICAL MIDPT	999143		18.87		1001009		23.93		988348		26.40	
	UPPER LIMIT	1998286				2002018				1976696			
	LOWER LIMIT	499572				500504				494174			
	CCAL	749957		18.93		810765		23.99		827698		26.46	
	UPPER LIMIT			19.43				24.49				26.96	
	LOWER LIMIT			18.43				23.49				25.96	
01	410C/DP	615958		18.93		674214		23.98		706514		26.46	
02													
03													
04													
05													
06													
07													
08													
09													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													
21													
22													
23													
24													
25													

IS4 = Phenanthrene-d10
IS5 = Chrysene-d12
IS6 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P. T4 MAINTENANCE

Ical Midpoint ID: IC0507A Ical Date: 05/07/12

Instrument ID: NT10 Cont. Cal Date: 05/14/12

		IS7 AREA #	RT #	AREA #	RT #	AREA #	RT #
	ICAL MIDPT	1489422	25.02				
	UPPER LIMIT	2978844					
	LOWER LIMIT	744711					
	CCAL	1290931	25.07				
	UPPER LIMIT		25.57				
	LOWER LIMIT		24.57				
01	410C/DP	1047391	25.06				
02							
03							
04							
05							
06							
07							
08							
09							
10							
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22							
23							
24							
25							

IS7 = Di-n-octylphthalate-d4

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-3

SIM PAH Analysis
Report and Summary QC Forms

ARI Job ID: UU16

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: 401A/DP
SAMPLE

Lab Sample ID: UU16A
LIMS ID: 12-8723
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 14:30
Instrument/Analyst: NT4/JZ
GPC Cleanup: No

Sample Amount: 10.6 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 45.1 %

CAS Number	Analyte	LOD	LOQ	Result	
91-20-3	Naphthalene	2.5	4.7	130	
91-57-6	2-Methylnaphthalene	1.4	4.7	40	
90-12-0	1-Methylnaphthalene	1.6	4.7	16	
208-96-8	Acenaphthylene	1.2	4.7	16	
83-32-9	Acenaphthene	1.2	4.7	49	
86-73-7	Fluorene	1.2	4.7	30	
85-01-8	Phenanthrene	1.9	4.7	190	
120-12-7	Anthracene	1.4	4.7	42	
206-44-0	Fluoranthene	1.7	4.7	320	
129-00-0	Pyrene	2.1	4.7	280	
56-55-3	Benzo(a)anthracene	1.5	4.7	99	Q
218-01-9	Chrysene	1.8	4.7	130	
50-32-8	Benzo(a)pyrene	1.7	4.7	140	
193-39-5	Indeno(1,2,3-cd)pyrene	3.3	4.7	80	
53-70-3	Dibenz(a,h)anthracene	2.3	4.7	17	
191-24-2	Benzo(g,h,i)perylene	2.9	4.7	110	
132-64-9	Dibenzofuran	1.4	4.7	19	
TOTBFA	Total Benzofluoranthenes	1.8	4.7	190	

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	66.3%
d14-Dibenzo(a,h)anthracen	72.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS **Sample ID: 401B/DP**
Page 1 of 1 **SAMPLE**

Lab Sample ID: UU16B
LIMS ID: 12-8724
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 14:57
Instrument/Analyst: NT4/JZ
GPC Cleanup: No

Sample Amount: 10.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 35.0 %

CAS Number	Analyte	LOD	LOQ	Result	
91-20-3	Naphthalene	2.4	4.6	460	
91-57-6	2-Methylnaphthalene	1.4	4.6	160	
90-12-0	1-Methylnaphthalene	1.6	4.6	61	
208-96-8	Acenaphthylene	1.2	4.6	36	
83-32-9	Acenaphthene	1.2	4.6	170	
86-73-7	Fluorene	1.2	4.6	74	
85-01-8	Phenanthrene	1.8	4.6	470	E
120-12-7	Anthracene	1.3	4.6	63	
206-44-0	Fluoranthene	1.6	4.6	400	
129-00-0	Pyrene	2.1	4.6	430	
56-55-3	Benzo(a)anthracene	1.5	4.6	130	Q
218-01-9	Chrysene	1.7	4.6	160	
50-32-8	Benzo(a)pyrene	1.6	4.6	150	
193-39-5	Indeno(1,2,3-cd)pyrene	3.2	4.6	100	
53-70-3	Dibenz(a,h)anthracene	2.2	4.6	21	
191-24-2	Benzo(g,h,i)perylene	2.8	4.6	140	
132-64-9	Dibenzofuran	1.4	4.6	48	
TOTBFA	Total Benzofluoranthenes	1.7	4.6	200	

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	73.3%
d14-Dibenzo(a,h)anthracen	101%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: 401B/DP DILUTION

Lab Sample ID: UU16B
LIMS ID: 12-8724
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 18:08
Instrument/Analyst: NT4/JZ
GPC Cleanup: No

Sample Amount: 10.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 3.00
Percent Moisture: 35.0 %

CAS Number	Analyte	LOD	LOQ	Result	
91-20-3	Naphthalene	7.3	14	450	
91-57-6	2-Methylnaphthalene	4.2	14	170	
90-12-0	1-Methylnaphthalene	4.7	14	69	
208-96-8	Acenaphthylene	3.5	14	37	
83-32-9	Acenaphthene	3.7	14	170	
86-73-7	Fluorene	3.6	14	75	
85-01-8	Phenanthrene	5.5	14	460	
120-12-7	Anthracene	4.0	14	56	
206-44-0	Fluoranthene	4.9	14	400	
129-00-0	Pyrene	6.2	14	450	
56-55-3	Benzo(a)anthracene	4.4	14	140	Q
218-01-9	Chrysene	5.2	14	160	
50-32-8	Benzo(a)pyrene	4.9	14	160	
193-39-5	Indeno(1,2,3-cd)pyrene	9.6	14	98	
53-70-3	Dibenz(a,h)anthracene	6.6	14	20	
191-24-2	Benzo(g,h,i)perylene	8.5	14	130	
132-64-9	Dibenzofuran	4.2	14	47	
TOTBFA	Total Benzofluoranthenes	5.1	14	220	

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	84.0%
d14-Dibenzo(a,h)anthracen	81.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: 401C/DP
SAMPLE

Lab Sample ID: UU16C
LIMS ID: 12-8725
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 15:24
Instrument/Analyst: NT4/JZ
GPC Cleanup: No

Sample Amount: 10.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 52.4 %

CAS Number	Analyte	LOD	LOQ	Result	
91-20-3	Naphthalene	2.4	4.6	34	
91-57-6	2-Methylnaphthalene	1.4	4.6	11	
90-12-0	1-Methylnaphthalene	1.6	4.6	6.7	
208-96-8	Acenaphthylene	1.2	4.6	8.9	
83-32-9	Acenaphthene	1.2	4.6	12	
86-73-7	Fluorene	1.2	4.6	11	
85-01-8	Phenanthrene	1.8	4.6	58	
120-12-7	Anthracene	1.4	4.6	18	
206-44-0	Fluoranthene	1.6	4.6	110	
129-00-0	Pyrene	2.1	4.6	120	
56-55-3	Benzo(a)anthracene	1.5	4.6	50	Q
218-01-9	Chrysene	1.7	4.6	67	
50-32-8	Benzo(a)pyrene	1.6	4.6	69	
193-39-5	Indeno(1,2,3-cd)pyrene	3.2	4.6	42	
53-70-3	Dibenz(a,h)anthracene	2.2	4.6	7.2	
191-24-2	Benzo(g,h,i)perylene	2.8	4.6	52	
132-64-9	Dibenzofuran	1.4	4.6	7.1	
TOTBFA	Total Benzofluoranthenes	1.7	4.6	97	

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	63.0%
d14-Dibenzo(a,h)anthracen	73.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: 410A/DP
SAMPLE

Lab Sample ID: UU16G
LIMS ID: 12-8729
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 15:52
Instrument/Analyst: NT4/JZ
GPC Cleanup: No

Sample Amount: 10.2 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 44.1 %

CAS Number	Analyte	LOD	LOQ	Result	
91-20-3	Naphthalene	2.6	4.9	29	
91-57-6	2-Methylnaphthalene	1.5	4.9	12	
90-12-0	1-Methylnaphthalene	1.7	4.9	11	
208-96-8	Acenaphthylene	1.2	4.9	7.1	
83-32-9	Acenaphthene	1.3	4.9	35	
86-73-7	Fluorene	1.3	4.9	27	
85-01-8	Phenanthrene	1.9	4.9	100	
120-12-7	Anthracene	1.4	4.9	23	
206-44-0	Fluoranthene	1.7	4.9	160	
129-00-0	Pyrene	2.2	4.9	160	
56-55-3	Benzo(a)anthracene	1.6	4.9	68	Q
218-01-9	Chrysene	1.8	4.9	83	
50-32-8	Benzo(a)pyrene	1.7	4.9	80	
193-39-5	Indeno(1,2,3-cd)pyrene	3.4	4.9	50	
53-70-3	Dibenz(a,h)anthracene	2.3	4.9	12	
191-24-2	Benzo(g,h,i)perylene	3.0	4.9	62	
132-64-9	Dibenzofuran	1.5	4.9	14	
TOTBFA	Total Benzofluoranthenes	1.8	4.9	130	

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	62.3%
d14-Dibenzo(a,h)anthracen	79.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: 410B/DP
SAMPLE

Lab Sample ID: UU16H
LIMS ID: 12-8730
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 16:19
Instrument/Analyst: NT4/JZ
GPC Cleanup: No

Sample Amount: 10.3 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 27.4 %

CAS Number	Analyte	LOD	LOQ	Result
91-20-3	Naphthalene	2.6	4.9	21
91-57-6	2-Methylnaphthalene	1.5	4.9	20
90-12-0	1-Methylnaphthalene	1.7	4.9	14
208-96-8	Acenaphthylene	1.2	4.9	4.1 J
83-32-9	Acenaphthene	1.3	4.9	38
86-73-7	Fluorene	1.3	4.9	28
85-01-8	Phenanthrene	1.9	4.9	130
120-12-7	Anthracene	1.4	4.9	36
206-44-0	Fluoranthene	1.7	4.9	140
129-00-0	Pyrene	2.2	4.9	140
56-55-3	Benzo(a)anthracene	1.6	4.9	46 Q
218-01-9	Chrysene	1.8	4.9	56
50-32-8	Benzo(a)pyrene	1.7	4.9	52
193-39-5	Indeno(1,2,3-cd)pyrene	3.4	4.9	34
53-70-3	Dibenz(a,h)anthracene	2.3	4.9	8.4
191-24-2	Benzo(g,h,i)perylene	3.0	4.9	44
132-64-9	Dibenzofuran	1.5	4.9	17
TOTBFA	Total Benzofluoranthenes	1.8	4.9	89

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	69.3%
d14-Dibenzo(a,h)anthracen	85.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: 410C/DP
SAMPLE

Lab Sample ID: UU16I
LIMS ID: 12-8731
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 17:41
Instrument/Analyst: NT4/JZ
GPC Cleanup: No

Sample Amount: 10.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 33.9 %

CAS Number	Analyte	LOD	LOQ	Result
91-20-3	Naphthalene	2.4	4.6	140
91-57-6	2-Methylnaphthalene	1.4	4.6	64
90-12-0	1-Methylnaphthalene	1.6	4.6	32
208-96-8	Acenaphthylene	1.2	4.6	21
83-32-9	Acenaphthene	1.2	4.6	210
86-73-7	Fluorene	1.2	4.6	120
85-01-8	Phenanthrene	1.8	4.6	820 E
120-12-7	Anthracene	1.3	4.6	190
206-44-0	Fluoranthene	1.6	4.6	1,400 ES
129-00-0	Pyrene	2.0	4.6	1,200 ES
56-55-3	Benzo(a)anthracene	1.5	4.6	1,200 QES
218-01-9	Chrysene	1.7	4.6	1,300 ES
50-32-8	Benzo(a)pyrene	1.6	4.6	1,400 ES
193-39-5	Indeno(1,2,3-cd)pyrene	3.2	4.6	1,000 ES
53-70-3	Dibenz(a,h)anthracene	2.2	4.6	280
191-24-2	Benzo(g,h,i)perylene	2.8	4.6	1,200 ES
132-64-9	Dibenzofuran	1.4	4.6	53
TOTBFA	Total Benzofluoranthenes	1.7	4.6	2,800 ES

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	64.7%
d14-Dibenzo(a,h)anthracen	110%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: 410C/DP
DILUTION

Lab Sample ID: UU16I
LIMS ID: 12-8731
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 18:35
Instrument/Analyst: NT4/JZ
GPC Cleanup: No

Sample Amount: 10.8 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 10.0
Percent Moisture: 33.9 %

CAS Number	Analyte	LOD	LOQ	Result	
91-20-3	Naphthalene	24	46	160	
91-57-6	2-Methylnaphthalene	14	46	70	
90-12-0	1-Methylnaphthalene	16	46	37	J
208-96-8	Acenaphthylene	12	46	24	J
83-32-9	Acenaphthene	12	46	230	
86-73-7	Fluorene	12	46	140	
85-01-8	Phenanthrene	18	46	1,100	
120-12-7	Anthracene	13	46	190	
206-44-0	Fluoranthene	16	46	2,700	
129-00-0	Pyrene	20	46	2,400	
56-55-3	Benzo(a)anthracene	15	46	1,500	Q
218-01-9	Chrysene	17	46	1,900	
50-32-8	Benzo(a)pyrene	16	46	1,900	
193-39-5	Indeno(1,2,3-cd)pyrene	32	46	1,200	
53-70-3	Dibenz(a,h)anthracene	22	46	300	
191-24-2	Benzo(g,h,i)perylene	28	46	1,400	
132-64-9	Dibenzofuran	14	46	60	
TOTBFA	Total Benzofluoranthenes	17	46	3,400	

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	70.0%
d14-Dibenzo(a,h)anthracen	113%

FORM I

ANALYTICAL RESOURCES INCORPORATED

SIM SW8270 SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00

Client ID	MNP	DBA	TOT OUT
401A/DP	66.3%	72.3%	0
401B/DP	73.3%	101%	0
401B/DP DL	84.0%	81.0%	0
401C/DP	63.0%	73.0%	0
410A/DP	62.3%	79.3%	0
MB-051212	64.7%	70.7%	0
LCS-051212	61.3%	75.3%	0
LCSD-051212	61.7%	78.7%	0
410B/DP	69.3%	85.0%	0
410B/DP MS	65.0%	81.0%	0
410B/DP MSD	65.7%	85.0%	0
410C/DP	64.7%	110%	0
410C/DP DL	70.0%	113%	0

	LCS/MB LIMITS	QC LIMITS
(MNP) = d10-2-Methylnaphthalene	(35-100)	(34-100)
(DBA) = d14-Dibenzo(a,h)anthracene	(37-120)	(10-117)

Prep Method: SW3546
Log Number Range: 12-8723 to 12-8731

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: 410B/DP
MATRIX SPIKE

Lab Sample ID: UU16H
LIMS ID: 12-8730
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted MS/MSD: 05/12/12

Sample Amount MS: 10.6 g-dry-wt
MSD: 10.2 g-dry-wt

Date Analyzed MS: 05/14/12 16:46
MSD: 05/14/12 17:14

Final Extract Volume MS: 0.50 mL
MSD: 0.50 mL

Instrument/Analyst MS: NT4/JZ
MSD: NT4/JZ

Dilution Factor MS: 1.00
MSD: 1.00

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Naphthalene	21.3	94.8	142	51.8%	103	146	56.0%	8.3%
2-Methylnaphthalene	20.3	84.5	142	45.2%	89.0	146	47.1%	5.2%
1-Methylnaphthalene	14.0	90.9	142	54.2%	96.2	146	56.3%	5.7%
Acenaphthylene	4.1 J	98.8	142	66.7%	106	146	69.8%	7.0%
Acenaphthene	38.5	106	142	47.5%	107	146	46.9%	0.9%
Fluorene	27.6	110	142	58.0%	146	146	81.1%	28.1%
Phenanthrene	127	162	142	24.6%	169	146	28.8%	4.2%
Anthracene	35.9	113	142	54.3%	116	146	54.9%	2.6%
Fluoranthene	145	261	142	81.7%	220	146	51.4%	17.0%
Pyrene	145	209	142	45.1%	229	146	57.5%	9.1%
Benzo(a)anthracene	46.4 Q	148 Q	142	71.5%	154 Q	146	73.7%	4.0%
Chrysene	55.5	152	142	68.0%	158	146	70.2%	3.9%
Benzo(a)pyrene	52.1	148	142	67.5%	156	146	71.2%	5.3%
Indeno(1,2,3-cd)pyrene	34.2	131	142	68.2%	136	146	69.7%	3.7%
Dibenz(a,h)anthracene	8.4	108	142	70.1%	114	146	72.3%	5.4%
Benzo(g,h,i)perylene	44.2	138	142	66.1%	145	146	69.0%	4.9%
Dibenzofuran	16.8	88.7	142	50.6%	95.7	146	54.0%	7.6%
Total Benzofluoranthenes	89.4	266	284	62.2%	276	293	63.7%	3.7%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: 410B/DP
MATRIX SPIKE

Lab Sample ID: UU16H
LIMS ID: 12-8730
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 16:46
Instrument/Analyst: NT4/JZ
GPC Cleanup: No

Sample Amount: 10.6 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 27.4 %

CAS Number	Analyte	LOD	LOQ	Result
91-20-3	Naphthalene	2.5	4.7	---
91-57-6	2-Methylnaphthalene	1.4	4.7	---
90-12-0	1-Methylnaphthalene	1.6	4.7	---
208-96-8	Acenaphthylene	1.2	4.7	---
83-32-9	Acenaphthene	1.2	4.7	---
86-73-7	Fluorene	1.2	4.7	---
85-01-8	Phenanthrene	1.9	4.7	---
120-12-7	Anthracene	1.4	4.7	---
206-44-0	Fluoranthene	1.7	4.7	---
129-00-0	Pyrene	2.1	4.7	---
56-55-3	Benzo(a)anthracene	1.5	4.7	---
218-01-9	Chrysene	1.8	4.7	---
50-32-8	Benzo(a)pyrene	1.7	4.7	---
193-39-5	Indeno(1,2,3-cd)pyrene	3.3	4.7	---
53-70-3	Dibenz(a,h)anthracene	2.3	4.7	---
191-24-2	Benzo(g,h,i)perylene	2.9	4.7	---
132-64-9	Dibenzofuran	1.4	4.7	---
TOTBFA	Total Benzofluoranthenes	1.8	4.7	---

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	65.0%
d14-Dibenzo(a,h)anthracen	81.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: 410B/DP
MATRIX SPIKE DUP

Lab Sample ID: UU16H
LIMS ID: 12-8730
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 17:14
Instrument/Analyst: NT4/JZ
GPC Cleanup: No

Sample Amount: 10.2 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: 27.4 %

CAS Number	Analyte	LOD	LOQ	Result
91-20-3	Naphthalene	2.6	4.9	---
91-57-6	2-Methylnaphthalene	1.5	4.9	---
90-12-0	1-Methylnaphthalene	1.7	4.9	---
208-96-8	Acenaphthylene	1.2	4.9	---
83-32-9	Acenaphthene	1.3	4.9	---
86-73-7	Fluorene	1.3	4.9	---
85-01-8	Phenanthrene	1.9	4.9	---
120-12-7	Anthracene	1.4	4.9	---
206-44-0	Fluoranthene	1.7	4.9	---
129-00-0	Pyrene	2.2	4.9	---
56-55-3	Benzo(a)anthracene	1.6	4.9	---
218-01-9	Chrysene	1.8	4.9	---
50-32-8	Benzo(a)pyrene	1.7	4.9	---
193-39-5	Indeno(1,2,3-cd)pyrene	3.4	4.9	---
53-70-3	Dibenz(a,h)anthracene	2.3	4.9	---
191-24-2	Benzo(g,h,i)perylene	3.0	4.9	---
132-64-9	Dibenzofuran	1.5	4.9	---
TOTBFA	Total Benzofluoranthenes	1.8	4.9	---

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	65.7%
d14-Dibenzo(a,h)anthracen	85.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: LCS-051212
LAB CONTROL SAMPLE

Lab Sample ID: LCS-051212
LIMS ID: 12-8730
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: NA
Date Received: NA

Date Extracted: 05/12/12

Sample Amount LCS: 10.0 g-dry-wt
LCSD: 10.0 g-dry-wt

Date Analyzed LCS: 05/14/12 13:35
LCSD: 05/14/12 14:02

Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL

Instrument/Analyst LCS: NT4/JZ
LCSD: NT4/JZ

Dilution Factor LCS: 1.00
LCSD: 1.00

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Naphthalene	80.6	150	53.7%	79.9	150	53.3%	0.9%
2-Methylnaphthalene	76.9	150	51.3%	78.6	150	52.4%	2.2%
1-Methylnaphthalene	85.2	150	56.8%	86.6	150	57.7%	1.6%
Acenaphthylene	78.0	150	52.0%	80.3	150	53.5%	2.9%
Acenaphthene	85.5	150	57.0%	84.4	150	56.3%	1.3%
Fluorene	91.5	150	61.0%	95.8	150	63.9%	4.6%
Phenanthrene	103	150	68.7%	104	150	69.3%	1.0%
Anthracene	103	150	68.7%	91.5	150	61.0%	11.8%
Fluoranthene	112	150	74.7%	115	150	76.7%	2.6%
Pyrene	112	150	74.7%	117	150	78.0%	4.4%
Benzo(a)anthracene	103 Q	150	68.7%	109 Q	150	72.7%	5.7%
Chrysene	112	150	74.7%	116	150	77.3%	3.5%
Benzo(a)pyrene	93.2	150	62.1%	96.6	150	64.4%	3.6%
Indeno(1,2,3-cd)pyrene	101	150	67.3%	107	150	71.3%	5.8%
Dibenz(a,h)anthracene	93.9	150	62.6%	94.9	150	63.3%	1.1%
Benzo(g,h,i)perylene	105	150	70.0%	109	150	72.7%	3.7%
Dibenzofuran	82.4	150	54.9%	87.8	150	58.5%	6.3%
Total Benzofluoranthenes	238	300	79.3%	241	300	80.3%	1.3%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

SIM Semivolatile Surrogate Recovery

	LCS	LCSD
d10-2-Methylnaphthalene	61.3%	61.7%
d14-Dibenzo(a,h)anthracen	75.3%	78.7%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

UU16MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UU16

Project: P.O.P. T4 MAINTENANC

Lab File ID: 05141203

Date Extracted: 05/12/12

Instrument ID: NT4

Date Analyzed: 05/14/12

Matrix: SOLID

Time Analyzed: 1308

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	UU16LCSS1	UU16LCSS1	05141204	05/14/12
02	UU16LCSDS1	UU16LCSDS1	05141205	05/14/12
03	401A/DP	UU16A	05141206	05/14/12
04	401B/DP	UU16B	05141207	05/14/12
05	401C/DP	UU16C	05141208	05/14/12
06	410A/DP	UU16G	05141209	05/14/12
07	410B/DP	UU16H	05141210	05/14/12
08	410B/DP MS	UU16HMS	05141211	05/14/12
09	410B/DP MSD	UU16HMSD	05141212	05/14/12
10	410C/DP	UU16I	05141213	05/14/12
11	401B/DP	UU16B	05141214	05/14/12
12	410C/DP	UU16I	05141215	05/14/12
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ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by SIM SW8270D-SIM GC/MS

Sample ID: MB-051212
METHOD BLANK

Lab Sample ID: MB-051212
LIMS ID: 12-8730
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance 15753-00
Date Sampled: NA
Date Received: NA

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 13:08
Instrument/Analyst: NT4/JZ
GPC Cleanup: No

Sample Amount: 10.0 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Percent Moisture: NA

CAS Number	Analyte	LOD	LOQ	Result
91-20-3	Naphthalene	2.6	5.0	< 5.0 U
91-57-6	2-Methylnaphthalene	1.5	5.0	< 5.0 U
90-12-0	1-Methylnaphthalene	1.7	5.0	< 5.0 U
208-96-8	Acenaphthylene	1.3	5.0	< 5.0 U
83-32-9	Acenaphthene	1.3	5.0	< 5.0 U
86-73-7	Fluorene	1.3	5.0	< 5.0 U
85-01-8	Phenanthrene	2.0	5.0	< 5.0 U
120-12-7	Anthracene	1.5	5.0	< 5.0 U
206-44-0	Fluoranthene	1.8	5.0	< 5.0 U
129-00-0	Pyrene	2.2	5.0	< 5.0 U
56-55-3	Benzo(a)anthracene	1.6	5.0	< 5.0 U
218-01-9	Chrysene	1.9	5.0	< 5.0 U
50-32-8	Benzo(a)pyrene	1.8	5.0	< 5.0 U
193-39-5	Indeno(1,2,3-cd)pyrene	3.5	5.0	< 5.0 U
53-70-3	Dibenz(a,h)anthracene	2.4	5.0	< 5.0 U
191-24-2	Benzo(g,h,i)perylene	3.0	5.0	< 5.0 U
132-64-9	Dibenzofuran	1.5	5.0	< 5.0 U
TOTBFA	Total Benzofluoranthenes	1.8	5.0	< 5.0 U

Reported in µg/kg (ppb)

SIM Semivolatile Surrogate Recovery

d10-2-Methylnaphthalene	64.7%
d14-Dibenzo(a,h)anthracen	70.7%

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

Instrument ID: NT4 Project: P.O.P T4 MAINTENANCE

DFTPP Injection Date: 03/16/12 DFTPP Injection Time: 1132

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	34.7
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	41.8
70	Less than 2.0% of mass 69	0.2 (0.5)1
127	10.0 - 80.0% of mass 198	48.8
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.1
275	10.0 - 60.0% of mass 198	28.9
365	Greater than 1.0% of mass 198	3.31
441	0.0 - 24.0% of mass 442	14.6 (17.2)2
442	50.0 - 200.0% of mass 198	84.4
443	15.0 - 24.0% of mass 442	17.0 (20.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	IC010316	IC010316	03161202	03/16/12	1311
02	IC050316	IC050316	03161203	03/16/12	1340
03	IC100316	IC100316	03161204	03/16/12	1409
04	IC250316	IC250316	03161205	03/16/12	1438
05	IC50316	IC50316	03161206	03/16/12	1507
06	IC100316	IC100316	03161207	03/16/12	1536
07					
08					
09					
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20					
21					
22					

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

Instrument ID: NT4 Project: P.O.P T4 MAINTENANCE

DFTPP Injection Date: 05/14/12 DFTPP Injection Time: 1147

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	36.6
68	Less than 2.0% of mass 69	0.0 (0.0)1
69	Mass 69 relative abundance	43.5
70	Less than 2.0% of mass 69	0.2 (0.4)1
127	10.0 - 80.0% of mass 198	49.1
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	8.1
275	10.0 - 60.0% of mass 198	29.4
365	Greater than 1.0% of mass 198	3.12
441	0.0 - 24.0% of mass 442	14.8 (15.5)2
442	50.0 - 200.0% of mass 198	95.5
443	15.0 - 24.0% of mass 442	19.0 (19.9)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	CC0514	CC0514	05141202	05/14/12	1204
02	UU16MBS1	UU16MBS1	05141203	05/14/12	1308
03	UU16LCSS1	UU16LCSS1	05141204	05/14/12	1335
04	UU16LCSDS1	UU16LCSDS1	05141205	05/14/12	1402
05	401A/DP	UU16A	05141206	05/14/12	1430
06	401B/DP	UU16B	05141207	05/14/12	1457
07	401C/DP	UU16C	05141208	05/14/12	1524
08	410A/DP	UU16G	05141209	05/14/12	1552
09	410B/DP	UU16H	05141210	05/14/12	1619
10	410B/DP MS	UU16HMS	05141211	05/14/12	1646
11	410B/DP MSD	UU16HMSD	05141212	05/14/12	1714
12	410C/DP	UU16I	05141213	05/14/12	1741
13	401B/DP	UU16B	05141214	05/14/12	1808
14	410C/DP	UU16I	05141215	05/14/12	1835
15					
16					
17					
18					
19					
20					
21					
22					

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P T4 MAINTENANCE

Instrument ID: NT4 Calibration Date: 03/16/12

LAB FILE ID: RRF0.1=03161202 RRF0.5=03161203 RRF1 =03161204
RRF2.5=03161205 RRF5 =03161206 RRF10 =03161207

COMPOUND	RRF 0.1	RRF 0.5	RRF 1	RRF 2.5	RRF 5	RRF 10	___ RRF	%RSD /R^2
Naphthalene	1.249	1.109	1.164	1.063	0.928	0.856	1.062	13.8
2-Methylnaphthalene	0.811	0.660	0.675	0.641	0.552	0.542	0.647	15.1
Acenaphthylene	1.608	1.650	1.669	1.658	1.466	1.543	1.599	5.0
Acenaphthene	1.263	1.194	1.228	1.155	1.025	1.070	1.156	8.0
Dibenzofuran	1.856	1.755	1.741	1.656	1.442	1.474	1.654	10.0
Fluorene	1.420	1.291	1.346	1.280	1.127	1.180	1.274	8.4
Phenanthrene	1.285	1.172	1.220	1.146	0.996	1.004	1.137	10.2
Anthracene	1.304	1.068	1.187	1.119	0.986	1.020	1.114	10.5
Fluoranthene	1.538	1.209	1.324	1.265	1.099	1.143	1.263	12.5
Pyrene	1.262	1.140	1.202	1.123	1.005	1.048	1.130	8.4
Benzo(a)anthracene	1.224	1.012	1.088	1.039	0.949	1.019	1.055	8.9
Chrysene	1.313	1.071	1.094	1.076	0.964	1.012	1.088	11.0
Benzo(b)fluoranthene	1.112	1.194	1.256	1.148	1.030	1.103	1.140	6.9
Benzo(k)fluoranthene	1.235	1.205	1.336	1.233	1.040	1.138	1.198	8.4
Benzo(j)fluoranthene	0.914	1.094	1.218	1.078	0.959	1.091	1.059	10.3
Benzo(a)pyrene		1.002	1.117	1.099	1.006	1.141	1.073	6.0
Indeno(1,2,3-cd)pyrene	1.256	1.245	1.363	1.322	1.209	1.364	1.293	5.1
Dibenzo(a,h)anthracene	1.176	1.014	1.110	1.079	1.017	1.147	1.090	6.1
Benzo(g,h,i)perylene	1.274	1.067	1.226	1.156	1.069	1.165	1.160	7.1
1-methylnaphthalene	0.742	0.607	0.639	0.602	0.525	0.516	0.605	13.7
Perylene	0.725	1.122	1.185	1.130	1.027	1.138	1.054	16.1
2-Methylnaphthalene-d10	0.803	0.619	0.705	0.649	0.553	0.546	0.646	15.1
Dibenzo(a,h)anthracene-d14	0.854	0.755	0.845	0.883	0.808	0.930	0.846	7.2

<- Outside QC limits: %RSD <20% or R^2 > 0.990

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P T4 MAINTENANCE

Instrument ID: NT4 Cont. Calib. Date: 05/14/12

Init. Calib. Date: 03/16/12 Cont. Calib. Time: 1204

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift	
Naphthalene	1.062	1.001	0.700	AVRG	-5.7	
2-Methylnaphthalene	0.647	0.607	0.400	AVRG	-6.2	
Acenaphthylene	1.599	1.422	0.900	AVRG	-11.1	
Acenaphthene	1.156	1.061	0.900	AVRG	-8.2	
Dibenzofuran	1.654	1.571	0.800	AVRG	-5.0	
Fluorene	1.274	1.180	0.900	AVRG	-7.4	
Phenanthrene	1.137	1.078	0.700	AVRG	-5.2	
Anthracene	1.114	0.947	0.700	AVRG	-15.0	
Fluoranthene	1.263	1.025	0.600	AVRG	-18.8	
Pyrene	1.130	1.014	0.600	AVRG	-10.3	
Benzo(a)anthracene	1.055	0.841	0.800	AVRG	-20.3	<-
Chrysene	1.088	1.003	0.700	AVRG	-7.8	
Benzo(b)fluoranthene	1.140	1.189	0.700	AVRG	4.3	
Benzo(k)fluoranthene	1.198	1.202	0.700	AVRG	0.3	
Benzo(j)fluoranthene	1.059	1.155	0.010	AVRG	9.1	
Benzo(a)pyrene	1.073	1.004	0.700	AVRG	-6.4	
Indeno(1,2,3-cd)pyrene	1.293	1.205	0.500	AVRG	-6.8	
Dibenzo(a,h)anthracene	1.090	0.934	0.400	AVRG	-14.3	
Benzo(g,h,i)perylene	1.160	1.140	0.500	AVRG	-1.7	
1-methylnaphthalene	0.605	0.580	0.010	AVRG	-4.1	
Perylene	1.054	1.100	0.010	AVRG	4.4	
2-Methylnaphthalene-d10	0.646	0.609	0.010	AVRG	-5.7	
Dibenzo(a,h)anthracene-d14	0.846	0.780	0.010	AVRG	-7.8	

<- Exceeds QC limit of 20% D

* RF less than minimum RF

FORM VII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P T4 MAINTENANCE

Ical Midpoint ID: 03161205 Ical Date: 03/16/12

Instrument ID: NT4 Cont. Cal Date: 05/14/12

		IS1(NPT) AREA #	RT #	IS2(ANT) AREA #	RT #	IS3(PHN) AREA #	RT #
	ICAL MIDPT	364113	5.43	210739	7.72	347113	9.69
	UPPER LIMIT	728226		421478		694226	
	LOWER LIMIT	182056		105370		173556	
	CCAL	384779	4.39	237979	6.62	488928	8.54
	UPPER LIMIT		4.89		7.12		9.04
	LOWER LIMIT		3.89		6.12		8.04
01	UU16MBS1	394255	4.38	232386	6.61	427297	8.53
02	UU16LCSS1	453442	4.38	276218	6.61	478231	8.53
03	UU16LCSDS1	364035	4.38	280096	6.61	495339	8.53
04	401A/DP	344633	4.38	228018	6.61	415032	8.53
05	401B/DP	347223	4.38	230408	6.61	404175	8.53
06	401C/DP	373175	4.38	232274	6.61	431878	8.53
07	410A/DP	372531	4.38	229182	6.61	415831	8.53
08	410B/DP	337894	4.38	221453	6.61	385282	8.53
09	410B/DP MS	355611	4.38	236357	6.61	428643	8.53
10	410B/DP MSD	343042	4.38	229752	6.61	512097	8.53
11	410C/DP	320796	4.38	259567	6.61	461625	8.53
12	401B/DP	325468	4.38	258433	6.61	460989	8.53
13	410C/DP	451610	4.38	280781	6.61	515746	8.53
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

IS1 = Naphthalene-d8
IS2 = Acenaphthene-d10
IS3 = Phenanthrene-d10

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-1

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P T4 MAINTENANCE

Ical Midpoint ID: 03161205 Ical Date: 03/16/12

Instrument ID: NT4 Cont. Cal Date: 05/14/12

		IS4(CRY) AREA #	RT #	IS5(PRY) AREA #	RT #	AREA #	RT #
	ICAL MIDPT	412003	14.89	386633	18.72		
	UPPER LIMIT	824006		773266			
	LOWER LIMIT	206002		193316			
	CCAL	529116	12.87	429765	16.35		
	UPPER LIMIT		13.37		16.85		
	LOWER LIMIT		12.37		15.85		
01	UU16MBS1	428917	12.86	328735	16.34		
02	UU16LCSS1	541308	12.85	455583	16.34		
03	UU16LCSDS1	551090	12.86	469935	16.33		
04	401A/DP	640063	12.86	650427	16.34		
05	401B/DP	496425	12.86	529777	16.33		
06	401C/DP	502945	12.85	636129	16.34		
07	410A/DP	503351	12.85	493256	16.33		
08	410B/DP	454589	12.85	449529	16.34		
09	410B/DP MS	620667	12.86	598083	16.34		
10	410B/DP MSD	579671	12.85	572943	16.34		
11	410C/DP	574865	12.86	578670	16.34		
12	401B/DP	548454	12.86	531902	16.33		
13	410C/DP	607770	12.86	604014	16.34		
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

IS4 = Chrysene-d12
IS5 = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

FORM VIII SV-2

Butyl Tin Analysis
Report and Summary QC Forms

ARI Job ID: UU16

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1

Sample ID: 401A/DP
SAMPLE

Lab Sample ID: UU16A
LIMS ID: 12-8723
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 16:03
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.53 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes
Moisture: 45.1%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	0.9	3.5	140	
14488-53-0	Dibutyltin Ion	3.4	5.2	9.8	
78763-54-9	Butyltin Ion	2.1	3.7	2.9	J

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	74.4%
Tripentyl Tin Chloride	90.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1

Sample ID: 401B/DP
SAMPLE

Lab Sample ID: UU16B
LIMS ID: 12-8724
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 16:16
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.38 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes
Moisture: 35.0%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	**Tributyltin Ion**	**0.9**	**3.6**	**2.4**	**J**
14488-53-0	Dibutyltin Ion	3.5	5.4	< 5.4	U
78763-54-9	Butyltin Ion	2.1	3.8	< 3.8	U

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	60.6%
Tripentyl Tin Chloride	84.4%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1

Sample ID: 401C/DP
SAMPLE

Lab Sample ID: UU16C
LIMS ID: 12-8725
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 16:29
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.37 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes
Moisture: 52.4%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	**Tributyltin Ion**	**0.9**	**3.6**	**5.2**	
14488-53-0	Dibutyltin Ion	3.5	5.4	< 5.4	U
78763-54-9	**Butyltin Ion**	**2.1**	**3.8**	**4.1**	**M**

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	65.0%
Tripentyl Tin Chloride	89.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS

Sample ID: 401A/NSM
SAMPLE

Lab Sample ID: UU16D
LIMS ID: 12-8726
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 16:42
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.32 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes
Moisture: 24.8%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	**Tributyltin Ion**	**1.0**	**3.6**	**17**	
14488-53-0	Dibutyltin Ion	3.6	5.4	< 5.4	U
78763-54-9	Butyltin Ion	2.2	3.8	< 3.8	U

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	71.1%
Tripentyl Tin Chloride	92.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1

Sample ID: 401B/NSM
SAMPLE

Lab Sample ID: UU16E
LIMS ID: 12-8727
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 17:20
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.91 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes
Moisture: 19.6%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	0.9	3.3	< 3.3	U
14488-53-0	Dibutyltin Ion	3.2	4.9	< 4.9	U
78763-54-9	Butyltin Ion	1.9	3.4	< 3.4	U

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	76.7%
Tripentyl Tin Chloride	91.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1

Sample ID: 401C/NSM
SAMPLE

Lab Sample ID: UU16F
LIMS ID: 12-8728
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 17:33
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.61 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes
Moisture: 44.8%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	0.9	3.4	32	
14488-53-0	Dibutyltin Ion	3.4	5.2	3.4	J
78763-54-9	Butyltin Ion	2.0	3.6	2.0	JM

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	66.7%
Tripentyl Tin Chloride	71.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS

Sample ID: 410A/DP
SAMPLE

Lab Sample ID: UU16G
LIMS ID: 12-8729
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 17:46
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.23 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes
Moisture: 44.1%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	1.0	3.7	< 3.7	U
14488-53-0	Dibutyltin Ion	3.6	5.5	< 5.5	U
78763-54-9	Butyltin Ion	2.2	3.9	< 3.9	U

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	64.3%
Tripentyl Tin Chloride	74.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1

Sample ID: 410B/DP
SAMPLE

Lab Sample ID: UU16H
LIMS ID: 12-8730
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 17:59
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.30 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes
Moisture: 27.4%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	**Tributyltin Ion**	**1.0**	**3.6**	**1.9**	**J**
14488-53-0	Dibutyltin Ion	3.6	5.4	< 5.4	U
78763-54-9	Butyltin Ion	2.2	3.8	< 3.8	U

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	63.1%
Tripentyl Tin Chloride	69.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1

Sample ID: 410C/DP
SAMPLE

Lab Sample ID: UU16I
LIMS ID: 12-8731
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 18:11
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.31 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes
Moisture: 33.9%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	**Tributyltin Ion**	**1.0**	**3.6**	**10**	
14488-53-0	Dibutyltin Ion	3.6	5.4	< 5.4	U
78763-54-9	Butyltin Ion	2.2	3.8	< 3.8	U

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	62.3%
Tripentyl Tin Chloride	71.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1

Sample ID: 410A/NSM
SAMPLE

Lab Sample ID: UU16J
LIMS ID: 12-8732
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 18:24
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.41 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes
Moisture: 40.4%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	**Tributyltin Ion**	**0.9**	**3.6**	**2.9**	**J**
14488-53-0	Dibutyltin Ion	3.5	5.3	< 5.3	U
78763-54-9	Butyltin Ion	2.1	3.8	< 3.8	U

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	63.1%
Tripentyl Tin Chloride	75.6%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1

Sample ID: 410B/NSM
SAMPLE

Lab Sample ID: UU16K
LIMS ID: 12-8733
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 18:37
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.26 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes
Moisture: 25.7%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	**Tributyltin Ion**	**1.0**	**3.7**	**14**	
14488-53-0	Dibutyltin Ion	3.6	5.5	< 5.5	U
78763-54-9	Butyltin Ion	2.2	3.9	< 3.9	U

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	54.5%
Tripentyl Tin Chloride	65.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1

Sample ID: 410C/NSM
SAMPLE

Lab Sample ID: UU16L
LIMS ID: 12-8734
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 18:50
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.50 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes
Moisture: 31.7%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	**Tributyltin Ion**	**0.9**	**3.5**	**18**	
14488-53-0	Dibutyltin Ion	3.5	5.2	< 5.2	U
78763-54-9	Butyltin Ion	2.1	3.7	< 3.7	U

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	70.6%
Tripentyl Tin Chloride	77.5%

ANALYTICAL RESOURCES INCORPORATED

TBT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00

Client ID	TPRT	TPNT	TOT OUT
401A/DP	74.4%	90.4%	0
401B/DP	60.6%	84.4%	0
401C/DP	65.0%	89.5%	0
MB-051212	66.0%	90.0%	0
LCS-051212	72.7%	89.9%	0
LCSD-051212	73.8%	90.4%	0
401A/NSM	71.1%	92.3%	0
401A/NSM MS	72.7%	94.3%	0
401A/NSM MSD	65.9%	88.8%	0
401B/NSM	76.7%	91.6%	0
401C/NSM	66.7%	71.2%	0
410A/DP	64.3%	74.7%	0
410B/DP	63.1%	69.8%	0
410C/DP	62.3%	71.0%	0
410A/NSM	63.1%	75.6%	0
410B/NSM	54.5%	65.0%	0
410C/NSM	70.6%	77.5%	0

	LCS/MB LIMITS	QC LIMITS
(TPRT) = Tripropyl Tin Chloride	(28-106)	(32-104)
(TPNT) = Tripentyl Tin Chloride	(35-130)	(25-140)

Prep Method: SW3546
Analytical Method: TBT (Hexyl) Krone 1988
Log Number Range: 12-8723 to 12-8734

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1

Sample ID: 401A/NSM
MATRIX SPIKE

Lab Sample ID: UU16D
LIMS ID: 12-8726
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted MS: 05/12/12

Sample Amount MS: 5.35 g-dry-wt
MSD: 5.35 g-dry-wt

Date Analyzed MS: 05/14/12 16:55
MSD: 05/14/12 17:07

Final Extract Volume MS: 0.5 mL
MSD: 0.5 mL

Instrument/Analyst MS: NT12/YZ
MSD: NT12/YZ

Dilution Factor MS: 1.00
MSD: 1.00

Silica Gel Cleanup: No

Alumina Cleanup: Yes
Moisture: 24.8%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Tributyltin Ion	17.3	52.7	41.7	84.9%	55.3	41.7	91.1%	4.8%
Dibutyltin Ion	< 5.4 U	26.4	35.9	73.5%	37.0	35.9	103%	33.4%
Butyltin Ion	< 3.8 U	11.5	29.2	39.4%	14.8	29.2	50.7%	25.1%

Results reported in µg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1

Sample ID: 401A/NSM
MATRIX SPIKE

Lab Sample ID: UU16D
LIMS ID: 12-8726
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 16:55
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.35 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes
Moisture: 24.8%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	1.0	3.6	---	
14488-53-0	Dibutyltin Ion	3.6	5.4	---	
78763-54-9	Butyltin Ion	2.1	3.8	---	

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	72.7%
Tripentyl Tin Chloride	94.3%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS **Sample ID: 401A/NSM**
Page 1 of 1 **MATRIX SPIKE DUP**

Lab Sample ID: UU16D
LIMS ID: 12-8726
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 17:07
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.35 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes
Moisture: 24.8%

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	1.0	3.6	---	
14488-53-0	Dibutyltin Ion	3.6	5.4	---	
78763-54-9	Butyltin Ion	2.1	3.8	---	

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	65.9%
Tripentyl Tin Chloride	88.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1

Sample ID: LCS-051212
LAB CONTROL SAMPLE

Lab Sample ID: LCS-051212
LIMS ID: 12-8726
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: NA
Date Received: NA

Date Extracted LCS: 05/12/12

Date Analyzed LCS: 05/14/12 15:38
LCSD: 05/14/12 15:51
Instrument/Analyst LCS: NT12/YZ
LCSD: NT12/YZ
Silica Gel Cleanup: No

Sample Amount LCS: 5.00 g-dry-wt
LCSD: 5.00 g-dry-wt
Final Extract Volume LCS: 0.50 mL
LCSD: 0.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Alumina Cleanup: Yes

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Tributyltin Ion	33.3	44.6	74.7%	35.1	44.6	78.7%	5.3%
Dibutyltin Ion	32.9	38.4	85.7%	34.8	38.4	90.6%	5.6%
Butyltin Ion	17.3	31.2	55.4%	18.1	31.2	58.0%	4.5%

Reported in µg/kg (ppb)

RPD calculated using sample concentrations per SW846.

TBT Surrogate Recovery

	LCS	LCSD
Tripropyl Tin Chloride	72.7%	73.8%
Tripentyl Tin Chloride	89.9%	90.4%

4B

SEMIVOLATILE METHOD BLANK SUMMARY

BLANK NO.

UU16MBS1

Lab Name: ANALYTICAL RESOURCES INC

Client: HART CROWSER

ARI Job No: UU16

Project: P.O.P. T4 MAINTENANC

Lab File ID: UU16MB

Date Extracted: 05/12/12

Instrument ID: NT12

Date Analyzed: 05/14/12

Matrix: SOLID

Time Analyzed: 1525

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	UU16LCSS1	UU16LCSS1	UU16SB	05/14/12
02	UU16LCSDS1	UU16LCSDS1	UU16SBD	05/14/12
03	401A/DP	UU16A	UU16A	05/14/12
04	401B/DP	UU16B	UU16B	05/14/12
05	401C/DP	UU16C	UU16C	05/14/12
06	401A/NSM	UU16D	UU16D	05/14/12
07	401A/NSM MS	UU16DMS	UU16DMS	05/14/12
08	401A/NSM MSD	UU16DMSD	UU16DMSD	05/14/12
09	401B/NSM	UU16E	UU16E	05/14/12
10	401C/NSM	UU16F	UU16F	05/14/12
11	410A/DP	UU16G	UU16G	05/14/12
12	410B/DP	UU16H	UU16H	05/14/12
13	410C/DP	UU16I	UU16I	05/14/12
14	410A/NSM	UU16J	UU16J	05/14/12
15	410B/NSM	UU16K	UU16K	05/14/12
16	410C/NSM	UU16L	UU16L	05/14/12
17				
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30				

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
Tributyl Tins by Krone 1988 SIM GC/MS
Page 1 of 1

Sample ID: MB-051212
METHOD BLANK

Lab Sample ID: MB-051212
LIMS ID: 12-8726
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: NA
Date Received: NA

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 15:25
Instrument/Analyst: NT12/YZ
Silica Gel Cleanup: No

Sample Amount: 5.00 g-dry-wt
Final Extract Volume: 0.50 mL
Dilution Factor: 1.00
Alumina Cleanup: Yes

CAS Number	Analyte	LOD	LOQ	Result	Q
36643-28-4	Tributyltin Ion	1.0	3.9	< 3.9	U
14488-53-0	Dibutyltin Ion	3.8	5.8	< 5.8	U
78763-54-9	Butyltin Ion	2.3	4.1	< 4.1	U

Reported in µg/kg (ppb)

TBT Surrogate Recovery

Tripropyl Tin Chloride	66.0%
Tripentyl Tin Chloride	90.0%

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

Instrument ID: NT12 Project: P.O.P. T4 MAINTENANCE

DFTPP Injection Date: 04/19/12 DFTPP Injection Time: 1052

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	27.6
68	Less than 2.0% of mass 69	1.1 (1.8)1
69	Mass 69 relative abundance	63.8
70	Less than 2.0% of mass 69	0.2 (0.4)1
127	10.0 - 80.0% of mass 198	59.0
197	Less than 2.0% of mass 198	0.0
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	6.9
275	10.0 - 60.0% of mass 198	28.2
365	Greater than 1.0% of mass 198	5.23
441	0.0 - 24.0% of mass 442	19.7 (16.7)2
442	50.0 - 200.0% of mass 198	118.3
443	15.0 - 24.0% of mass 442	25.1 (21.2)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		TBT 1	IC0419A	04/19/12	1105
02		TBT 4	IC0419B	04/19/12	1118
03		TBT .05	IC0419C	04/19/12	1131
04		TBT 2	IC0419D	04/19/12	1143
05		TBT .2	IC0419E	04/19/12	1156
06		TBT .5	IC0419F	04/19/12	1209
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM V SV

5B

SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

Instrument ID: NT12 Project: P.O.P. T4 MAINTENANCE

DFTPP Injection Date: 05/14/12 DFTPP Injection Time: 1446

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	10.0 - 80.0% of mass 198	28.6
68	Less than 2.0% of mass 69	0.1 (0.1)1
69	Mass 69 relative abundance	60.4
70	Less than 2.0% of mass 69	0.5 (0.8)1
127	10.0 - 80.0% of mass 198	60.8
197	Less than 2.0% of mass 198	0.1
198	Base Peak, 100% relative abundance	100.0
199	5.0 to 9.0% of mass 198	7.4
275	10.0 - 60.0% of mass 198	30.5
365	Greater than 1.0% of mass 198	5.73
441	0.0 - 24.0% of mass 442	23.7 (17.4)2
442	50.0 - 200.0% of mass 198	135.9
443	15.0 - 24.0% of mass 442	32.4 (23.8)2

1-Value is % mass 69 2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		CC0514	CC0514	05/14/12	1512
02	UU16MBS1	UU16MBS1	UU16MB	05/14/12	1525
03	UU16LCSS1	UU16LCSS1	UU16SB	05/14/12	1538
04	UU16LCSDS1	UU16LCSDS1	UU16SBD	05/14/12	1551
05	401A/DP	UU16A	UU16A	05/14/12	1603
06	401B/DP	UU16B	UU16B	05/14/12	1616
07	401C/DP	UU16C	UU16C	05/14/12	1629
08	401A/NSM	UU16D	UU16D	05/14/12	1642
09	401A/NSM MS	UU16DMS	UU16DMS	05/14/12	1655
10	401A/NSM MSD	UU16DMSD	UU16DMSD	05/14/12	1707
11	401B/NSM	UU16E	UU16E	05/14/12	1720
12	401C/NSM	UU16F	UU16F	05/14/12	1733
13	410A/DP	UU16G	UU16G	05/14/12	1746
14	410B/DP	UU16H	UU16H	05/14/12	1759
15	410C/DP	UU16I	UU16I	05/14/12	1811
16	410A/NSM	UU16J	UU16J	05/14/12	1824
17	410B/NSM	UU16K	UU16K	05/14/12	1837
18	410C/NSM	UU16L	UU16L	05/14/12	1850
19					
20					
21					
22					

6B

SEMIVOLATILE 8270-D INITIAL CALIBRATION DATA

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P. T4 MAINTENANCE

Instrument ID: NT12 Calibration Date: 04/19/12

LAB FILE ID: RRF0.05=IC0419C RRF0.2=IC0419E RRF0.5=IC0419F
RRF1 =IC0419A RRF2 =IC0419D RRF4 =IC0419B

COMPOUND	RRF 0.05	RRF 0.2	RRF 0.5	RRF 1	RRF 2	RRF 4	___ RRF	%RSD /R^2
Tributyl Tin (Hexyl)	0.844	0.744	0.869	0.735	0.701	0.648	0.757	11.1
Dibutyl Tin (Hexyl)	0.064	0.053	0.059	0.054	0.050	0.047	0.054	10.7
Butyl Tin (Hexyl)	0.108	0.086	0.097	0.086	0.083	0.077	0.090	12.3
Tetrabutyl Tin	0.902	0.744	0.921	0.772	0.737	0.680	0.793	12.3
Tripropyl Tin (Hexyl)	0.902	0.729	0.905	0.765	0.714	0.664	0.780	13.0
Tripentyl Tin (Hexyl)	0.094	0.076	0.087	0.075	0.072	0.068	0.079	12.2

<- Outside QC limits: %RSD <20% or R^2 > 0.990

7B

SEMIVOLATILE 8270-D CONTINUING CALIBRATION CHECK

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P. T4 MAINTENANCE

Instrument ID: NT12 Cont. Calib. Date: 05/14/12

Init. Calib. Date: 04/19/12 Cont. Calib. Time: 1512

COMPOUND	CalAmt or ARF	CC Amt or RF	MIN RRF	CURVE TYPE	%D or Drift
Tributyl Tin (Hexyl)	0.757	0.706	0.010	AVRG	-6.7
Dibutyl Tin (Hexyl)	0.054	0.059	0.010	AVRG	9.2
Butyl Tin (Hexyl)	0.090	0.096	0.010	AVRG	6.7
Tetrabutyl Tin	0.793	0.734	0.010	AVRG	-7.4
Tripropyl Tin (Hexyl)	0.780	0.714	0.010	AVRG	-8.5
Tripentyl Tin (Hexyl)	0.079	0.083	0.010	AVRG	5.1

<- Exceeds QC limit of 20% D
* RF less than minimum RF

8B

SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No: UU16 Project: P.O.P. T4 MAINTENANCE

Ical Midpoint ID: IC0419A Ical Date: 04/19/12

Instrument ID: NT12 Cont. Cal Date: 05/14/12

		IS1 AREA #	IS1 RT #	IS2 AREA #	IS2 RT #	AREA #	RT #
	ICAL MIDPT	301873	7.94	282776	8.92		
	UPPER LIMIT	603746		565552			
	LOWER LIMIT	150936		141388			
	CCAL	254139	7.88	211309	8.86		
	UPPER LIMIT		8.38		9.36		
	LOWER LIMIT		7.38		8.36		
01	UU16MBS1	230207	7.88	173098	8.84		
02	UU16LCSS1	232687	7.88	193292	8.84		
03	UU16LCSDS1	216538	7.88	181619	8.84		
04	401A/DP	228176	7.88	179945	8.84		
05	401B/DP	251662	7.88	194919	8.84		
06	401C/DP	255244	7.88	194355	8.84		
07	401A/NSM	234507	7.88	180292	8.84		
08	401A/NSM MS	245378	7.88	191239	8.84		
09	401A/NSM MSD	245946	7.88	186494	8.84		
10	401B/NSM	286263	7.88	227745	8.84		
11	401C/NSM	301511	7.88	262475	8.84		
12	410A/DP	313880	7.88	288810	8.84		
13	410B/DP	375407	7.88	358996	8.84		
14	410C/DP	342835	7.88	306380	8.84		
15	410A/NSM	338316	7.88	298848	8.84		
16	410B/NSM	378491	7.88	345483	8.84		
17	410C/NSM	308824	7.88	268252	8.84		
18							
19							
20							
21							
22							
23							
24							
25							

IS1 = Tetrapentyl Tin
IS2 = p-Terphenyl-d14

AREA UPPER LIMIT = +100% of internal standard area from Ical midpoint
AREA LOWER LIMIT = - 50% of internal standard area from Ical midpoint
RT UPPER LIMIT = + 0.50 minutes of internal standard RT from Cont. Cal
RT LOWER LIMIT = - 0.50 minutes of internal standard RT from Cont. Cal

* Values outside of QC limits.

SEMIVOLATILES SUMMARY 05/11/12
Page 1 of 1

ANALYTICAL RESOURCES INCORPORATED

ARI Job No: **UU16**

Inquiry Number: NONE
Analysis Requested: 05/11/12
Contact: Ernst, Rick
Client: Hart Crowser
Logged by: JM
Sample Set Used: Yes-~~401~~
Validatable Package: Lv4
J-flags required: YES NO
Deliverables Require Spectra (Circle one): YES NO

PC: Kelly
VTSR: 05/11/12 10:15
Data Due: 05/15/12

Project #: 15753-00
Project: P.O.P. T4 Maintenance
Sample Site:
SDG No:

___See enclosed instructions
~~No~~ enclosed instructions

Special Instructions All Samples:

12 Sample(s)

GC/MS SIM TBT Analytes (3 Total)
Butyltin Ion Dibutyltin Ion Tributyltin Ion
GC/MS SIM TBT Surrogates
Tripropyl Tin Chloride Tripentyl Tin Chloride

ARI ID	Client ID	Matrix	Sampling Date	TBT (Hexyl)	Rtype
12-8723-UU16A	401A/DP	Sediment	05/09/12	X(3)	32
12-8724-UU16B	401B/DP	Sediment	05/08/12	X(3)	32
12-8725-UU16C	401C/DP	Sediment	05/09/12	X(3)	32
12-8726-UU16D	401A/NSM	Sediment	05/09/12	X(3)	32
12-8727-UU16E	401B/NSM	Sediment	05/08/12	X(3)	32
12-8728-UU16F	401C/NSM	Sediment	05/09/12	X(3)	32
12-8729-UU16G	410A/DP	Sediment	05/08/12	X(3)	32
12-8730-UU16H	410B/DP	Sediment	05/08/12	X(3)	32
12-8731-UU16I	410C/DP	Sediment	05/08/12	X(3)	32
12-8732-UU16J	410A/NSM	Sediment	05/08/12	X(3)	32
12-8733-UU16K	410B/NSM	Sediment	05/08/12	X(3)	32
12-8734-UU16L	410C/NSM	Sediment	05/08/12	X(3)	32

SVOA Special Instructions: None

Sample Condition Sample Comment-All Analyses

PM OK _____ Date 5/11/12

Pesticide Analysis
Report and Summary QC Forms

ARI Job ID: UU16

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD **Sample ID: 401A/DP**
Page 1 of 1 **SAMPLE**

Lab Sample ID: UU16A
LIMS ID: 12-8723
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/16/12 06:33
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 45.1%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.047	0.49	< 0.49 U
76-44-8	Heptachlor	0.13	0.49	< 0.49 U
309-00-2	Aldrin	0.054	0.49	< 0.49 U
60-57-1	Dieldrin	0.098	0.98	< 0.98 U
72-55-9	**4,4'-DDE**	**0.12**	**0.98**	**3.6**
72-54-8	**4,4'-DDD**	**0.13**	**0.98**	**2.2**
50-29-3	4,4'-DDT	0.19	0.98	< 0.98 U
5103-74-2	trans-Chlordane	0.076	0.49	< 0.49 U
5103-71-9	cis-Chlordane	0.050	0.49	< 0.49 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	87.2%
Tetrachlorometaxylene	85.8%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 401A/DP
DILUTION

Lab Sample ID: UU16A
LIMS ID: 12-8723
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/15/12 14:13
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 10.0
Silica Gel: Yes

Percent Moisture: 45.1%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.47	4.9	< 4.9 U
76-44-8	Heptachlor	1.3	4.9	< 4.9 U
309-00-2	Aldrin	0.54	4.9	< 4.9 U
60-57-1	Dieldrin	0.98	9.8	< 9.8 U
72-55-9	4,4'-DDE	1.2	9.8	< 9.8 U
72-54-8	4,4'-DDD	1.3	9.8	< 9.8 U
50-29-3	4,4'-DDT	1.9	9.8	< 9.8 U
5103-74-2	trans-Chlordane	0.76	4.9	< 4.9 U
5103-71-9	cis-Chlordane	0.50	4.9	< 4.9 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	94.0%
Tetrachlorometaxylene	103%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 401B/DP
SAMPLE

Lab Sample ID: UU16B
LIMS ID: 12-8724
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/16/12 06:50
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 13.1 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 35.0%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.046	0.48	< 0.48 U
76-44-8	Heptachlor	0.13	0.48	< 0.48 U
309-00-2	Aldrin	0.053	0.48	< 0.48 U
60-57-1	Dieldrin	0.096	0.96	< 0.96 U
72-55-9	**4,4'-DDE**	**0.12**	**0.96**	**4.1**
72-54-8	**4,4'-DDD**	**0.13**	**0.96**	**3.3**
50-29-3	4,4'-DDT	0.18	0.96	< 0.96 U
5103-74-2	**trans-Chlordane**	**0.074**	**0.48**	**0.67**
5103-71-9	cis-Chlordane	0.049	0.48	< 0.48 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	85.5%
Tetrachlorometaxylene	76.2%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD **Sample ID: 401B/DP**
Page 1 of 1 **DILUTION**

Lab Sample ID: UU16B
LIMS ID: 12-8724
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/15/12 14:31
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 13.1 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 10.0
Silica Gel: Yes

Percent Moisture: 35.0%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.46	4.8	< 4.8 U
76-44-8	Heptachlor	1.3	4.8	< 4.8 U
309-00-2	Aldrin	0.53	4.8	< 4.8 U
60-57-1	Dieldrin	0.96	9.6	< 9.6 U
72-55-9	4,4'-DDE	1.2	9.6	< 9.6 U
72-54-8	4,4'-DDD	1.3	9.6	< 9.6 U
50-29-3	4,4'-DDT	1.8	9.6	< 9.6 U
5103-74-2	trans-Chlordane	0.74	4.8	< 4.8 U
5103-71-9	cis-Chlordane	0.49	4.8	< 4.8 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	86.8%
Tetrachlorometaxylene	98.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 401C/DP
SAMPLE

Lab Sample ID: UU16C
LIMS ID: 12-8725
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/16/12 07:08
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.9 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 52.4%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.046	0.48	< 0.48 U
76-44-8	Heptachlor	0.13	0.48	< 0.48 U
309-00-2	Aldrin	0.053	0.48	< 0.48 U
60-57-1	Dieldrin	0.097	0.97	< 0.97 U
72-55-9	**4,4'-DDE**	**0.12**	**0.97**	**2.2**
72-54-8	**4,4'-DDD**	**0.13**	**0.97**	**1.1**
50-29-3	4,4'-DDT	0.19	0.97	< 0.97 U
5103-74-2	trans-Chlordane	0.075	0.48	< 0.48 U
5103-71-9	cis-Chlordane	0.049	0.48	< 0.48 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	70.0%
Tetrachlorometaxylene	74.2%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 401C/DP DILUTION

Lab Sample ID: UU16C
LIMS ID: 12-8725
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/15/12 14:49
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.9 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 10.0
Silica Gel: Yes

Percent Moisture: 52.4%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.46	4.8	< 4.8 U
76-44-8	Heptachlor	1.3	4.8	< 4.8 U
309-00-2	Aldrin	0.53	4.8	< 4.8 U
60-57-1	Dieldrin	0.97	9.7	< 9.7 U
72-55-9	4,4'-DDE	1.2	9.7	< 9.7 U
72-54-8	4,4'-DDD	1.3	9.7	< 9.7 U
50-29-3	4,4'-DDT	1.9	9.7	< 9.7 U
5103-74-2	trans-Chlordane	0.75	4.8	< 4.8 U
5103-71-9	cis-Chlordane	0.49	4.8	< 4.8 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	75.5%
Tetrachlorometaxylene	102%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD **Sample ID: 401A/NSM**
Page 1 of 1 **SAMPLE**

Lab Sample ID: UU16D
LIMS ID: 12-8726
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/16/12 07:26
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 13.0 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 24.8%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.046	0.48	< 0.48 U
76-44-8	Heptachlor	0.13	0.48	< 0.48 U
309-00-2	Aldrin	0.053	0.48	< 0.48 U
60-57-1	Dieldrin	0.096	0.96	< 0.96 U
72-55-9	**4,4'-DDE**	**0.12**	**0.96**	**2.1**
72-54-8	**4,4'-DDD**	**0.13**	**0.96**	**1.4**
50-29-3	4,4'-DDT	0.18	0.96	< 0.96 U
5103-74-2	trans-Chlordane	0.074	0.48	< 0.48 U
5103-71-9	cis-Chlordane	0.049	0.48	< 0.48 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	99.2%
Tetrachlorometaxylene	85.5%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD **Sample ID: 401A/NSM**
Page 1 of 1 **DILUTION**

Lab Sample ID: UU16D
LIMS ID: 12-8726
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/15/12 15:07
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 13.0 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 10.0
Silica Gel: Yes

Percent Moisture: 24.8%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.46	4.8	< 4.8 U
76-44-8	Heptachlor	1.3	4.8	< 4.8 U
309-00-2	Aldrin	0.53	4.8	< 4.8 U
60-57-1	Dieldrin	0.96	9.6	< 9.6 U
72-55-9	4,4'-DDE	1.2	9.6	< 9.6 U
72-54-8	4,4'-DDD	1.3	9.6	< 9.6 U
50-29-3	4,4'-DDT	1.8	9.6	< 9.6 U
5103-74-2	trans-Chlordane	0.74	4.8	< 4.8 U
5103-71-9	cis-Chlordane	0.49	4.8	< 4.8 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	103%
Tetrachlorometaxylene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD **Sample ID: 401B/NSM**
Page 1 of 1 **SAMPLE**

Lab Sample ID: UU16E
LIMS ID: 12-8727
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/15/12 17:29
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 13.0 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 19.6%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.046	0.48	< 0.48 U
76-44-8	Heptachlor	0.13	0.48	< 0.48 U
309-00-2	Aldrin	0.053	0.48	< 0.48 U
60-57-1	Dieldrin	0.096	0.96	< 0.96 U
72-55-9	4,4'-DDE	0.12	0.96	< 0.96 U
72-54-8	4,4'-DDD	0.13	0.96	< 0.96 U
50-29-3	4,4'-DDT	0.18	0.96	< 0.96 U
5103-74-2	trans-Chlordane	0.074	0.48	< 0.48 U
5103-71-9	cis-Chlordane	0.049	0.48	< 0.48 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	83.5%
Tetrachlorometaxylene	82.8%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 401C/NSM
SAMPLE

Lab Sample ID: UU16F
LIMS ID: 12-8728
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/16/12 07:44
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.8 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 44.8%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.047	0.49	< 0.49 U
76-44-8	Heptachlor	0.13	0.49	< 0.49 U
309-00-2	Aldrin	0.054	0.49	< 0.49 U
60-57-1	Dieldrin	0.097	0.97	< 0.97 U
72-55-9	**4,4'-DDE**	**0.12**	**0.97**	**5.5 P**
72-54-8	**4,4'-DDD**	**0.13**	**0.97**	**2.5**
50-29-3	4,4'-DDT	0.19	0.97	< 0.97 U
5103-74-2	trans-Chlordane	0.075	0.49	< 0.49 U
5103-71-9	cis-Chlordane	0.050	0.49	< 0.49 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	83.0%
Tetrachlorometaxylene	82.5%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 401C/NSM
DILUTION

Lab Sample ID: UU16F
LIMS ID: 12-8728
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/15/12 17:47
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.8 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 10.0
Silica Gel: Yes

Percent Moisture: 44.8%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.47	4.9	< 4.9 U
76-44-8	Heptachlor	1.3	4.9	< 4.9 U
309-00-2	Aldrin	0.54	4.9	< 4.9 U
60-57-1	Dieldrin	0.97	9.7	< 9.7 U
72-55-9	4,4'-DDE	1.2	9.7	< 9.7 U
72-54-8	4,4'-DDD	1.3	9.7	< 9.7 U
50-29-3	4,4'-DDT	1.9	9.7	< 9.7 U
5103-74-2	trans-Chlordane	0.75	4.9	< 4.9 U
5103-71-9	cis-Chlordane	0.50	4.9	< 4.9 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	90.0%
Tetrachlorometaxylene	110%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 410A/DP
SAMPLE

Lab Sample ID: UU16G
LIMS ID: 12-8729
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/16/12 08:02
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.9 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 44.1%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.046	0.48	< 0.48 U
76-44-8	Heptachlor	0.13	0.48	< 0.48 U
309-00-2	Aldrin	0.053	0.48	< 0.48 U
60-57-1	Dieldrin	0.097	0.97	< 0.97 U
72-55-9	**4,4'-DDE**	**0.12**	**0.97**	**1.7**
72-54-8	**4,4'-DDD**	**0.13**	**0.97**	**0.92 J**
50-29-3	4,4'-DDT	0.19	0.97	< 0.97 U
5103-74-2	trans-Chlordane	0.074	0.48	< 0.48 U
5103-71-9	cis-Chlordane	0.049	0.48	< 0.48 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	92.0%
Tetrachlorometaxylene	81.8%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 410A/DP DILUTION

Lab Sample ID: UU16G
LIMS ID: 12-8729
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/15/12 18:05
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.9 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 10.0
Silica Gel: Yes

Percent Moisture: 44.1%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.46	4.8	< 4.8 U
76-44-8	Heptachlor	1.3	4.8	< 4.8 U
309-00-2	Aldrin	0.53	4.8	< 4.8 U
60-57-1	Dieldrin	0.97	9.7	< 9.7 U
72-55-9	4,4'-DDE	1.2	9.7	< 9.7 U
72-54-8	4,4'-DDD	1.3	9.7	< 9.7 U
50-29-3	4,4'-DDT	1.9	9.7	< 9.7 U
5103-74-2	trans-Chlordane	0.74	4.8	< 4.8 U
5103-71-9	cis-Chlordane	0.49	4.8	< 4.8 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	90.5%
Tetrachlorometaxylene	117%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 410B/DP
SAMPLE

Lab Sample ID: UU16H
LIMS ID: 12-8730
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/16/12 08:19
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 13.2 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 27.4%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.045	0.47	< 0.47 U
76-44-8	Heptachlor	0.12	0.47	< 0.47 U
309-00-2	Aldrin	0.052	0.47	< 0.47 U
60-57-1	Dieldrin	0.095	0.95	< 0.95 U
72-55-9	**4,4'-DDE**	**0.12**	**0.95**	**0.96 J**
72-54-8	**4,4'-DDD**	**0.13**	**0.95**	**1.1 JP**
50-29-3	4,4'-DDT	0.18	0.95	< 0.95 U
5103-74-2	trans-Chlordane	0.073	0.47	< 0.47 U
5103-71-9	cis-Chlordane	0.048	0.47	< 0.47 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	87.5%
Tetrachlorometaxylene	85.0%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 410B/DP
DILUTION

Lab Sample ID: UU16H
LIMS ID: 12-8730
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/15/12 18:22
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 13.2 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 10.0
Silica Gel: Yes

Percent Moisture: 27.4%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.45	4.7	< 4.7 U
76-44-8	Heptachlor	1.2	4.7	< 4.7 U
309-00-2	Aldrin	0.52	4.7	< 4.7 U
60-57-1	Dieldrin	0.95	9.5	< 9.5 U
72-55-9	4,4'-DDE	1.2	9.5	< 9.5 U
72-54-8	4,4'-DDD	1.3	9.5	< 9.5 U
50-29-3	4,4'-DDT	1.8	9.5	< 9.5 U
5103-74-2	trans-Chlordane	0.73	4.7	< 4.7 U
5103-71-9	cis-Chlordane	0.48	4.7	< 4.7 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	90.2%
Tetrachlorometaxylene	104%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 410C/DP
SAMPLE

Lab Sample ID: UU16I
LIMS ID: 12-8731
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/16/12 08:37
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 33.9%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.047	0.49	< 0.49 U
76-44-8	Heptachlor	0.13	0.49	< 0.49 U
309-00-2	Aldrin	0.054	0.49	< 0.49 U
60-57-1	Dieldrin	0.098	0.98	< 0.98 U
72-55-9	**4,4'-DDE**	**0.12**	**0.98**	**2.3**
72-54-8	**4,4'-DDD**	**0.13**	**0.98**	**2.2**
50-29-3	4,4'-DDT	0.19	0.98	< 0.98 U
5103-74-2	trans-Chlordane	0.076	1.9	< 1.9 Y
5103-71-9	cis-Chlordane	0.050	0.49	< 0.49 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	90.5%
Tetrachlorometaxylene	86.5%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 410C/DP
DILUTION

Lab Sample ID: UU16I
LIMS ID: 12-8731
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/15/12 18:40
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 10.0
Silica Gel: Yes

Percent Moisture: 33.9%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.47	4.9	< 4.9 U
76-44-8	Heptachlor	1.3	4.9	< 4.9 U
309-00-2	Aldrin	0.54	4.9	< 4.9 U
60-57-1	Dieldrin	0.98	9.8	< 9.8 U
72-55-9	4,4'-DDE	1.2	9.8	< 9.8 U
72-54-8	4,4'-DDD	1.3	9.8	< 9.8 U
50-29-3	4,4'-DDT	1.9	9.8	< 9.8 U
5103-74-2	trans-Chlordane	0.76	4.9	< 4.9 U
5103-71-9	cis-Chlordane	0.50	4.9	< 4.9 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	90.8%
Tetrachlorometaxylene	104%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 410A/NSM
SAMPLE

Lab Sample ID: UU16J
LIMS ID: 12-8732
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/16/12 08:55
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 40.4%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.047	0.49	< 0.49 U
76-44-8	Heptachlor	0.13	0.49	< 0.49 U
309-00-2	Aldrin	0.054	0.49	< 0.49 U
60-57-1	Dieldrin	0.099	0.99	< 0.99 U
72-55-9	**4,4'-DDE**	**0.12**	**0.99**	**3.3**
72-54-8	**4,4'-DDD**	**0.13**	**0.99**	**3.6**
50-29-3	4,4'-DDT	0.19	0.99	< 0.99 U
5103-74-2	trans-Chlordane	0.076	0.49	< 0.49 U
5103-71-9	cis-Chlordane	0.050	0.49	< 0.49 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	76.2%
Tetrachlorometaxylene	76.8%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 410A/NSM
DILUTION

Lab Sample ID: UU16J
LIMS ID: 12-8732
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/15/12 18:58
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 10.0
Silica Gel: Yes

Percent Moisture: 40.4%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.47	4.9	< 4.9 U
76-44-8	Heptachlor	1.3	4.9	< 4.9 U
309-00-2	Aldrin	0.54	4.9	< 4.9 U
60-57-1	Dieldrin	0.99	9.9	< 9.9 U
72-55-9	4,4'-DDE	1.2	9.9	< 9.9 U
72-54-8	4,4'-DDD	1.3	9.9	< 9.9 U
50-29-3	4,4'-DDT	1.9	9.9	< 9.9 U
5103-74-2	trans-Chlordane	0.76	4.9	< 4.9 U
5103-71-9	cis-Chlordane	0.50	4.9	< 4.9 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	80.5%
Tetrachlorometaxylene	93.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 410B/NSM
SAMPLE

Lab Sample ID: UU16K
LIMS ID: 12-8733
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/16/12 09:13
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.8 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 25.7%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.047	0.49	< 0.49 U
76-44-8	Heptachlor	0.13	0.49	< 0.49 U
309-00-2	Aldrin	0.054	0.49	< 0.49 U
60-57-1	Dieldrin	0.098	0.98	< 0.98 U
72-55-9	**4,4'-DDE**	**0.12**	**0.98**	**2.5 P**
72-54-8	**4,4'-DDD**	**0.13**	**0.98**	**1.3**
50-29-3	4,4'-DDT	0.19	0.98	< 0.98 U
5103-74-2	trans-Chlordane	0.075	0.49	< 0.49 U
5103-71-9	cis-Chlordane	0.050	0.49	< 0.49 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	83.5%
Tetrachlorometaxylene	87.8%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 410B/NSM
DILUTION

Lab Sample ID: UU16K
LIMS ID: 12-8733
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/15/12 19:16
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.8 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 10.0
Silica Gel: Yes

Percent Moisture: 25.7%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.47	4.9	< 4.9 U
76-44-8	Heptachlor	1.3	4.9	< 4.9 U
309-00-2	Aldrin	0.54	4.9	< 4.9 U
60-57-1	Dieldrin	0.98	9.8	< 9.8 U
72-55-9	4,4'-DDE	1.2	9.8	< 9.8 U
72-54-8	4,4'-DDD	1.3	9.8	< 9.8 U
50-29-3	4,4'-DDT	1.9	9.8	< 9.8 U
5103-74-2	trans-Chlordane	0.75	4.9	< 4.9 U
5103-71-9	cis-Chlordane	0.50	4.9	< 4.9 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	86.5%
Tetrachlorometaxylene	109%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD **Sample ID: 410C/NSM**
Page 1 of 1 **SAMPLE**

Lab Sample ID: UU16L
LIMS ID: 12-8734
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/16/12 12:11
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 13.0 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 31.7%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.046	0.48	< 0.48 U
76-44-8	Heptachlor	0.13	0.48	< 0.48 U
309-00-2	Aldrin	0.053	0.48	< 0.48 U
60-57-1	Dieldrin	0.096	3.6	< 3.6 Y
72-55-9	**4,4'-DDE**	**0.12**	**0.96**	**8.2 P**
72-54-8	**4,4'-DDD**	**0.13**	**0.96**	**5.2**
50-29-3	4,4'-DDT	0.18	2.7	< 2.7 Y
5103-74-2	trans-Chlordane	0.074	0.48	< 0.48 U
5103-71-9	cis-Chlordane	0.049	0.48	< 0.48 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	110%
Tetrachlorometaxylene	88.0%

This analyte (CAS registry No. 5103-74-2) is named trans-Chlordane in EPA Method 8081B(Feb 2007). It has also been named gamma-Chlordane and beta-Chlordane.

$ This analyte (CAS registry No. 5103-71-9) is named cis-Chlordane in EPA Method 8081B(Feb 2007). It has also been named alpha-Chlordane.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 410C/NSM
DILUTION

Lab Sample ID: UU16L
LIMS ID: 12-8734
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/15/12 20:09
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 13.0 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 100
Silica Gel: Yes

Percent Moisture: 31.7%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	4.6	48	< 48 U
76-44-8	Heptachlor	13	48	< 48 U
309-00-2	Aldrin	5.3	48	< 48 U
60-57-1	Dieldrin	9.6	96	< 96 U
72-55-9	4,4'-DDE	12	96	< 96 U
72-54-8	4,4'-DDD	13	96	< 96 U
50-29-3	4,4'-DDT	18	96	< 96 U
5103-74-2	trans-Chlordane	7.4	48	< 48 U
5103-71-9	cis-Chlordane	4.9	48	< 48 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	D
Tetrachlorometaxylene	D

ANALYTICAL RESOURCES INCORPORATED

SW8081 PESTICIDE SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00

Client ID	DCBP	TCMX	TOT OUT
401A/DP	87.2%	85.8%	0
401A/DP DL	94.0%	103%	0
401B/DP	85.5%	76.2%	0
401B/DP DL	86.8%	98.2%	0
401C/DP	70.0%	74.2%	0
401C/DP DL	75.5%	102%	0
401A/NSM	99.2%	85.5%	0
401A/NSM DL	103%	100%	0
401B/NSM	83.5%	82.8%	0
401C/NSM	83.0%	82.5%	0
401C/NSM DL	90.0%	110%	0
410A/DP	92.0%	81.8%	0
410A/DP DL	90.5%	117%	0
410B/DP	87.5%	85.0%	0
410B/DP DL	90.2%	104%	0
410C/DP	90.5%	86.5%	0
410C/DP DL	90.8%	104%	0
410A/NSM	76.2%	76.8%	0
410A/NSM DL	80.5%	93.2%	0
MB-051212	91.8%	87.2%	0
LCS-051212	93.8%	87.0%	0
LCSD-051212	91.8%	82.0%	0
410B/NSM	83.5%	87.8%	0
410B/NSM DL	86.5%	109%	0
410B/NSM MS	88.2%	88.5%	0
410B/NSM MSD	91.2%	93.5%	0
410C/NSM	110%	88.0%	0
410C/NSM DL	D	D	0

	LCS/MB LIMITS	QC LIMITS
(DCBP) = Decachlorobiphenyl	(59-123)	(22-156)
(TCMX) = Tetrachlorometaxylene	(42-112)	(29-142)

Prep Method: SW3546
Log Number Range: 12-8723 to 12-8734

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 410B/NSM
MS/MSD

Lab Sample ID: UU16K
LIMS ID: 12-8733
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted MS/MSD: 05/12/12

Sample Amount MS: 12.8 g-dry-wt
MSD: 12.8 g-dry-wt

Date Analyzed MS: 05/16/12 10:42
MSD: 05/16/12 11:00

Final Extract Volume MS: 2.5 mL
MSD: 2.5 mL

Instrument/Analyst MS: ECD6/AAR
MSD: ECD6/AAR

Dilution Factor MS: 1.00
MSD: 1.00

GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Silica Gel: Yes

Percent Moisture: 25.7%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
gamma-BHC (Lindane)	< 0.489	3.76	3.91	96.2%	3.83	3.91	98.0%	1.8%
Heptachlor	< 0.489	2.31	3.91	59.1%	2.44	3.91	62.4%	5.5%
Aldrin	< 0.489	3.23	3.91	82.6%	3.34	3.91	85.4%	3.3%
Dieldrin	< 0.978	6.94	7.82	88.7%	7.27	7.81	93.1%	4.6%
4,4'-DDE	2.52	10.9 P	7.82	107%	11.8 P	7.81	119%	7.9%
4,4'-DDD	1.31	8.22	7.82	88.4%	8.87	7.81	96.8%	7.6%
4,4'-DDT	< 0.978	2.82	7.82	36.1%	3.18	7.81	40.7%	12.0%
trans-Chlordane	< 0.489	4.13	3.91	106%	4.32	3.91	110%	4.5%
cis-Chlordane	< 0.489	3.60	3.91	92.1%	3.98 P	3.91	102%	10.0%

Reported in µg/kg (ppb)
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 410B/NSM
MATRIX SPIKE

Lab Sample ID: UU16K
LIMS ID: 12-8733
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/16/12 10:42
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.8 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 25.7%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.047	0.49	---
76-44-8	Heptachlor	0.13	0.49	---
309-00-2	Aldrin	0.054	0.49	---
60-57-1	Dieldrin	0.098	0.98	---
72-55-9	4,4'-DDE	0.12	0.98	---
72-54-8	4,4'-DDD	0.13	0.98	---
50-29-3	4,4'-DDT	0.19	0.98	---
5103-74-2	trans-Chlordane	0.075	0.49	---
5103-71-9	cis-Chlordane	0.050	0.49	---

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	88.2%
Tetrachlorometaxylene	88.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: 410B/NSM
MATRIX SPIKE DUP

Lab Sample ID: UU16K
LIMS ID: 12-8733
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/16/12 11:00
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.8 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: 25.7%

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.047	0.49	---
76-44-8	Heptachlor	0.13	0.49	---
309-00-2	Aldrin	0.054	0.49	---
60-57-1	Dieldrin	0.098	0.98	---
72-55-9	4,4'-DDE	0.12	0.98	---
72-54-8	4,4'-DDD	0.13	0.98	---
50-29-3	4,4'-DDT	0.19	0.98	---
5103-74-2	trans-Chlordane	0.075	0.49	---
5103-71-9	cis-Chlordane	0.050	0.49	---

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	91.2%
Tetrachlorometaxylene	93.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: LCS-051212
LCS/LCSD

Lab Sample ID: LCS-051212
LIMS ID: 12-8733
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted LCS/LCSD: 05/12/12

Date Analyzed LCS: 05/15/12 08:35
LCSD: 05/15/12 08:52
Instrument/Analyst LCS: ECD6/AAR
LCSD: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No
Acid Cleanup: No

Sample Amount LCS: 12.5 g-dry-wt
LCSD: 12.5 g-dry-wt
Final Extract Volume LCS: 2.5 mL
LCSD: 2.5 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: Yes

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
gamma-BHC (Lindane)	3.98	4.00	99.5%	4.02	4.00	100%	1.0%
Heptachlor	3.22	4.00	80.5%	3.28	4.00	82.0%	1.8%
Aldrin	3.34	4.00	83.5%	3.36	4.00	84.0%	0.6%
Dieldrin	7.58	8.00	94.8%	7.56	8.00	94.5%	0.3%
4,4'-DDE	8.60	8.00	108%	8.80	8.00	110%	2.3%
4,4'-DDD	7.58	8.00	94.8%	7.52	8.00	94.0%	0.8%
4,4'-DDT	6.98	8.00	87.2%	6.94	8.00	86.8%	0.6%
trans-Chlordane	3.84	4.00	96.0%	4.00	4.00	100%	4.1%
cis-Chlordane	3.68	4.00	92.0%	3.66	4.00	91.5%	0.5%

Pest/PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	93.8%	91.8%
Tetrachlorometaxylene	87.0%	82.0%

Reported in µg/kg (ppb)
RPD calculated using sample concentrations per SW846.

FORM 4
PESTICIDE METHOD BLANK SUMMARY

BLANK NO.

UU16MBS1

Lab Name: ANALYTICAL RESOURCES INC
Client: HART CROWSER

ARI Job No.: UU16
Project: P.O.P. T4 MAINTENANC

Lab Sample ID: UU16MBS1
Lab File ID: 0514A083

Date Extracted: 05/12/12
Matrix: SOLID

Date Analyzed: 05/15/12
Instrument ID: ECD6

Time Analyzed: 0817
GC Columns: STX-CLP1/STX-CLP2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	UU16LCSS1	UU16LCSS1	05/15/12
02	UU16LCSDS1	UU16LCSDS1	05/15/12
03	401A/DP	UU16A	05/15/12
04	401B/DP	UU16B	05/15/12
05	401C/DP	UU16C	05/15/12
06	401A/NSM	UU16D	05/15/12
07	401B/NSM	UU16E	05/15/12
08	401C/NSM	UU16F	05/15/12
09	410A/DP	UU16G	05/15/12
10	410B/DP	UU16H	05/15/12
11	410C/DP	UU16I	05/15/12
12	410A/NSM	UU16J	05/15/12
13	410B/NSM	UU16K	05/15/12
14	410B/NSM MS	UU16KMS	05/15/12
15	410B/NSM MSD	UU16KMSD	05/15/12
16	410C/NSM	UU16L	05/15/12
17	401A/DP	UU16A	05/16/12
18	401B/DP	UU16B	05/16/12
19	401C/DP	UU16C	05/16/12
20	401A/NSM	UU16D	05/16/12
21	401C/NSM	UU16F	05/16/12
22	410A/DP	UU16G	05/16/12
23	410B/DP	UU16H	05/16/12
24	410C/DP	UU16I	05/16/12
25	410A/NSM	UU16J	05/16/12
26	410B/NSM	UU16K	05/16/12
27	410B/NSM MS	UU16KMS	05/16/12

ALL RUNS ARE DUAL COLUMN

FORM IV PCB

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA Pesticides/PCB by GC/ECD
Page 1 of 1

Sample ID: MB-051212
METHOD BLANK

Lab Sample ID: MB-051212
LIMS ID: 12-8733
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance 15753-00
Date Sampled: NA
Date Received: NA

Date Extracted: 05/12/12
Date Analyzed: 05/15/12 08:17
Instrument/Analyst: ECD6/AAR
GPC Cleanup: No
Sulfur Cleanup: Yes
Florisil Cleanup: No

Sample Amount: 12.5 g
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: Yes

Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
58-89-9	gamma-BHC (Lindane)	0.048	0.50	< 0.50 U
76-44-8	Heptachlor	0.13	0.50	< 0.50 U
309-00-2	Aldrin	0.055	0.50	< 0.50 U
60-57-1	Dieldrin	0.10	1.0	< 1.0 U
72-55-9	4,4'-DDE	0.12	1.0	< 1.0 U
72-54-8	4,4'-DDD	0.14	1.0	< 1.0 U
50-29-3	4,4'-DDT	0.19	1.0	< 1.0 U
5103-74-2	trans-Chlordane	0.077	0.50	< 0.50 U
5103-71-9	cis-Chlordane	0.051	0.50	< 0.50 U

Reported in µg/kg (ppb)

Pest/PCB Surrogate Recovery

Decachlorobiphenyl	91.8%
Tetrachlorometaxylene	87.2%

8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP1 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 04/09/12

	RT OF STANDARDS							MEAN	RT WINDOW	
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	RT	FROM	TO
alpha-BHC	3.87	3.87	3.87	3.87	3.87	3.87	3.87	3.87	3.82	3.92
beta-BHC	4.23	4.23	4.23	4.23	4.22	4.21	4.21	4.22	4.16	4.26
delta-BHC	4.39	4.39	4.39	4.38	4.38	4.37	4.37	4.38	4.32	4.42
gamma-BHC (Lindane)	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.13	4.08	4.18
Heptachlor	4.54	4.54	4.54	4.54	4.54	4.54	4.54	4.54	4.49	4.59
Aldrin	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.81	4.76	4.86
Heptachlor epoxide b	5.37	5.37	5.37	5.37	5.37	5.37	5.37	5.37	5.32	5.42
Endosulfan I	5.75	5.75	5.75	5.75	5.75	5.75	5.74	5.75	5.69	5.79
Dieldrin	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.97	5.92	6.02
4,4'-DDE	5.71	5.71	5.71	5.71	5.70	5.70	5.70	5.71	5.65	5.75
Endrin	6.19	6.19	6.19	6.19	6.19	6.19	6.19	6.19	6.14	6.24
Endosulfan II	6.40	6.40	6.40	6.40	6.40	6.40	6.39	6.40	6.34	6.44
4,4'-DDD	6.27	6.27	6.27	6.26	6.26	6.26	6.25	6.26	6.20	6.30
Endosulfan sulfate	7.16	7.16	7.16	7.16	7.16	7.16	7.16	7.16	7.11	7.21
4,4'-DDT	6.52	6.52	6.52	6.51	6.51	6.51	6.51	6.51	6.46	6.56
Methoxychlor	6.95	6.95	6.95	6.95	6.95	6.95	6.95	6.95	6.90	7.00
Endrin ketone	7.41	7.42	7.41	7.41	7.41	7.41	7.41	7.41	7.36	7.46
Endrin aldehyde	6.78	6.78	6.78	6.78	6.77	6.77	6.77	6.78	6.72	6.82
gamma-Chlordane	5.50	5.50	5.50	5.50	5.49	5.49	5.49	5.50	5.44	5.54
alpha-Chlordane	5.62	5.62	5.62	5.62	5.62	5.62	5.62	5.62	5.57	5.67
Hexachlorobutadiene	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.07	2.02	2.12
Hexachlorobenzene	3.76	3.76	3.76	3.76	3.75	3.74	3.74	3.75	3.69	3.79
Tetrachloro-m-xylene	3.43	3.43	3.43	3.43	3.43	3.43	3.42	3.43	3.37	3.47
Decachlorobiphenyl	8.28	8.28	8.28	8.27	8.27	8.27	8.27	8.27	8.22	8.32

6D

8081 INITIAL CALIBRATION RETENTION TIMES

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP2 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 04/09/12

	RT OF STANDARDS							MEAN	RT WINDOW	
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	RT	FROM	TO
alpha-BHC	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.14	4.09	4.19
beta-BHC	4.55	4.55	4.55	4.55	4.55	4.54	4.54	4.55	4.49	4.59
delta-BHC	4.84	4.83	4.83	4.83	4.83	4.83	4.82	4.83	4.77	4.87
gamma-BHC (Lindane)	4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.46	4.41	4.51
Heptachlor	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.89	4.84	4.94
Aldrin	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.21	5.16	5.26
Heptachlor epoxide b	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.72	5.82
Endosulfan I	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.16	6.11	6.21
Dieldrin	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.42	6.37	6.47
4,4'-DDE	6.26	6.26	6.26	6.26	6.25	6.25	6.25	6.26	6.20	6.30
Endrin	6.71	6.71	6.71	6.71	6.71	6.71	6.71	6.71	6.66	6.76
Endosulfan II	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.90	6.85	6.95
4,4'-DDD	6.80	6.80	6.80	6.79	6.79	6.79	6.79	6.79	6.74	6.84
Endosulfan sulfate	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.45	7.40	7.50
4,4'-DDT	7.08	7.08	7.08	7.08	7.08	7.08	7.07	7.08	7.02	7.12
Methoxychlor	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.67	7.62	7.72
Endrin ketone	7.93	7.93	7.92	7.92	7.92	7.92	7.92	7.92	7.87	7.97
Endrin aldehyde	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.20	7.15	7.25
gamma-Chlordane	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.96	5.91	6.01
alpha-Chlordane	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.10	6.05	6.15
Hexachlorobutadiene	2.14	2.14	2.14	2.14	2.14	2.14	2.14	2.14	2.09	2.19
Hexachlorobenzene	4.04	4.04	4.04	4.04	4.04	4.03	4.03	4.04	3.98	4.08
Tetrachloro-m-xylene	3.62	3.62	3.62	3.62	3.62	3.62	3.62	3.62	3.57	3.67
Decachlorobiphenyl	8.96	8.96	8.96	8.95	8.95	8.95	8.95	8.95	8.90	9.00

6E

8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP1 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 04/09/12

	CALIBRATION FACTORS								R^2
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	MEAN	%RSD
alpha-BHC	1.5907	1.6216	1.6040	1.6266	1.6275	1.6963	1.8514	1.6597	5.5
beta-BHC	0.5483	0.5895	0.5955	0.6031	0.6184	0.6252	0.6865	0.6095	6.9
delta-BHC	0.9142	0.9480	0.9828	1.0447	1.1864	1.2582	1.4766	1.1158	18.2
gamma-BHC (Lindane)	1.0869	1.1296	1.1641	1.2043	1.3156	1.3316	1.4642	1.2423	10.8
Heptachlor	1.5434	1.5606	1.5671	1.6063	1.5757	1.6136	1.7163	1.5976	3.6
Aldrin	1.2837	1.3181	1.3460	1.3879	1.4413	1.4614	1.5710	1.4013	7.0
Heptachlor epoxide b	1.2906	1.2582	1.2685	1.2954	1.3466	1.3297	1.4023	1.3130	3.8
Endosulfan I	1.8687	1.8151	1.8173	1.8312	1.6422	1.7264	1.7516	1.7789	4.3
Dieldrin	1.2904	1.3069	1.3495	1.3836	1.2066	1.3835	1.4912	1.3445	6.7
4,4'-DDE	0.6438	0.6504	0.6956	0.7646	1.0021	0.9306	1.0894	0.8252	0.9915
Endrin	0.9888	0.9804	1.0097	1.0383	1.0222	1.0475	1.1127	1.0285	4.3
Endosulfan II	0.9426	0.9191	0.9326	0.9539	0.9113	0.9588	1.0205	0.9484	3.8
4,4'-DDD	0.7562	0.7451	0.7612	0.7957	0.8241	0.8558	0.9325	0.8101	8.3
Endosulfan sulfate	0.8655	0.8173	0.8261	0.8536	0.8272	0.8564	0.9202	0.8523	4.1
4,4'-DDT	0.8609	0.8403	0.8689	0.9143	0.9232	0.9617	1.0434	0.9161	7.6
Methoxychlor	0.5312	0.5029	0.4924	0.4863	0.4580	0.4760	0.5152	0.4946	5.0
Endrin ketone	1.2466	1.1542	1.1148	1.1059	1.0492	1.0769	1.1434	1.1273	5.7
Endrin aldehyde	0.7925	0.7556	0.7572	0.7737	0.7587	0.7825	0.8348	0.7793	3.6
gamma-Chlordane	1.2915	1.2598	1.2730	1.3037	1.3684	1.3829	1.4952	1.3392	6.2
alpha-Chlordane	1.2764	1.2246	1.2310	1.2542	1.1303	1.3010	1.4073	1.2607	6.7
Hexachlorobutadiene	1.9234	1.8810	1.8170	1.8086	1.7617	1.7440	1.8410	1.8252	3.5
Hexachlorobenzene	1.2905	1.2692	1.2066	1.1756	1.2087	1.2014	1.3157	1.2382	4.3
Tetrachloro-m-xylene	1.4191	1.2582	1.1152	1.0550	1.0174	1.0176	1.0817	1.1377	13.1
Decachlorobiphenyl	1.2542	1.0802	1.0115	0.9662	0.8883	0.8967	0.9349	1.0046	12.8

6E

8081 PESTICIDE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP2 ID: 0.53 (mm) Instrument ID: ECD6

Calibration Date: 04/09/12

	CALIBRATION FACTORS								R^2
COMPOUND	LVL 1	LVL 2	LVL 3	LVL 4	LVL 5	LVL 6	LVL 7	MEAN	%RSD
alpha-BHC	1.4570	1.4464	1.4244	1.4045	1.3188	1.4163	1.5125	1.4257	4.1
beta-BHC	0.5672	0.5623	0.5775	0.5553	0.5317	0.5259	0.5644	0.5549	3.4
delta-BHC	0.8602	0.7854	0.7783	0.8001	0.8576	0.9259	1.0828	0.8700	12.3
gamma-BHC (Lindane)	1.2554	1.2054	1.1760	1.1534	1.1248	1.1840	1.2845	1.1976	4.7
Heptachlor	1.5955	1.5070	1.4242	1.3578	0.9224	1.2072	1.2213	1.3193	17.1
Aldrin	1.4604	1.3233	1.1916	1.1098	1.0593	1.0478	1.0857	1.1826	13.2
Heptachlor epoxide b	1.2127	1.1756	1.0685	1.0242	1.0015	0.9610	1.0091	1.0646	8.9
Endosulfan I	1.0434	1.0159	0.9340	0.9154	0.8718	0.8545	0.8882	0.9319	7.7
Dieldrin	1.0676	1.0390	0.9833	0.9638	0.9097	0.8927	0.9123	0.9669	7.0
4,4'-DDE	0.9305	0.8898	0.8158	0.8055	0.8197	0.7703	0.8327	0.8378	6.5
Endrin	1.6309	1.6003	1.5135	1.4830	1.3580	1.3460	1.3483	1.4686	8.2
Endosulfan II	1.5036	1.4467	1.3945	1.3697	1.2914	1.2696	1.2731	1.3641	6.7
4,4'-DDD	1.3297	1.2773	1.2112	1.1971	1.1791	1.1455	1.2017	1.2202	5.1
Endosulfan sulfate	1.2936	1.1917	1.1582	1.2057	1.1032	1.0866	1.1100	1.1641	6.3
4,4'-DDT	1.4385	1.2992	1.2682	1.2631	1.2194	1.2041	1.2668	1.2799	6.0
Methoxychlor	0.7026	0.6402	0.5953	0.5797	0.4879	0.4594	0.4440	0.5584	15.8
Endrin ketone	1.7674	1.6756	1.5810	1.7512	1.5000	1.4429	1.4124	1.5901	9.1
Endrin aldehyde	1.2810	1.1836	1.1393	1.1127	0.9181	1.0079	1.0294	1.0960	11.0
gamma-Chlordane	1.0876	1.0784	1.0109	0.9820	0.9639	0.9411	1.0080	1.0103	5.5
alpha-Chlordane	1.0324	1.0059	0.9442	0.9210	0.7750	0.8794	0.9485	0.9295	9.2
Hexachlorobutadiene	1.7827	1.6408	1.5743	1.4821	1.1765	1.4008	1.4483	1.5008	12.8
Hexachlorobenzene	1.3488	1.3141	1.2720	1.2295	1.1756	1.2166	1.3125	1.2670	4.9
Tetrachloro-m-xylene	0.9760	1.0178	0.9959	0.9629	0.8343	0.8739	0.9222	0.9404	7.1
Decachlorobiphenyl	1.4682	1.3588	1.2120	1.1302	1.0158	1.0016	1.0372	1.1748	15.4

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS ARI Job No.: 20120409PEST

Analysis Date: 15-MAY-2012 07:06 Init. Calib. Date: 09-APR-2012

GC Column: STX-CLP1 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	5.675	99724
Endrin	6.167	4923991
4,4'-DDD	6.233	165653
4,4'-DDT	6.487	4475412
Endrin ketone	7.392	269416
Endrin aldehyde	6.753	124293

DDT Percent Breakdown = 5.6 %
((99724+165653) * 100)/(99724+165653+4475412)

Endrin Percent Breakdown = 7.4 %
((124293+269416) * 100)/(124293+269416+4923991)

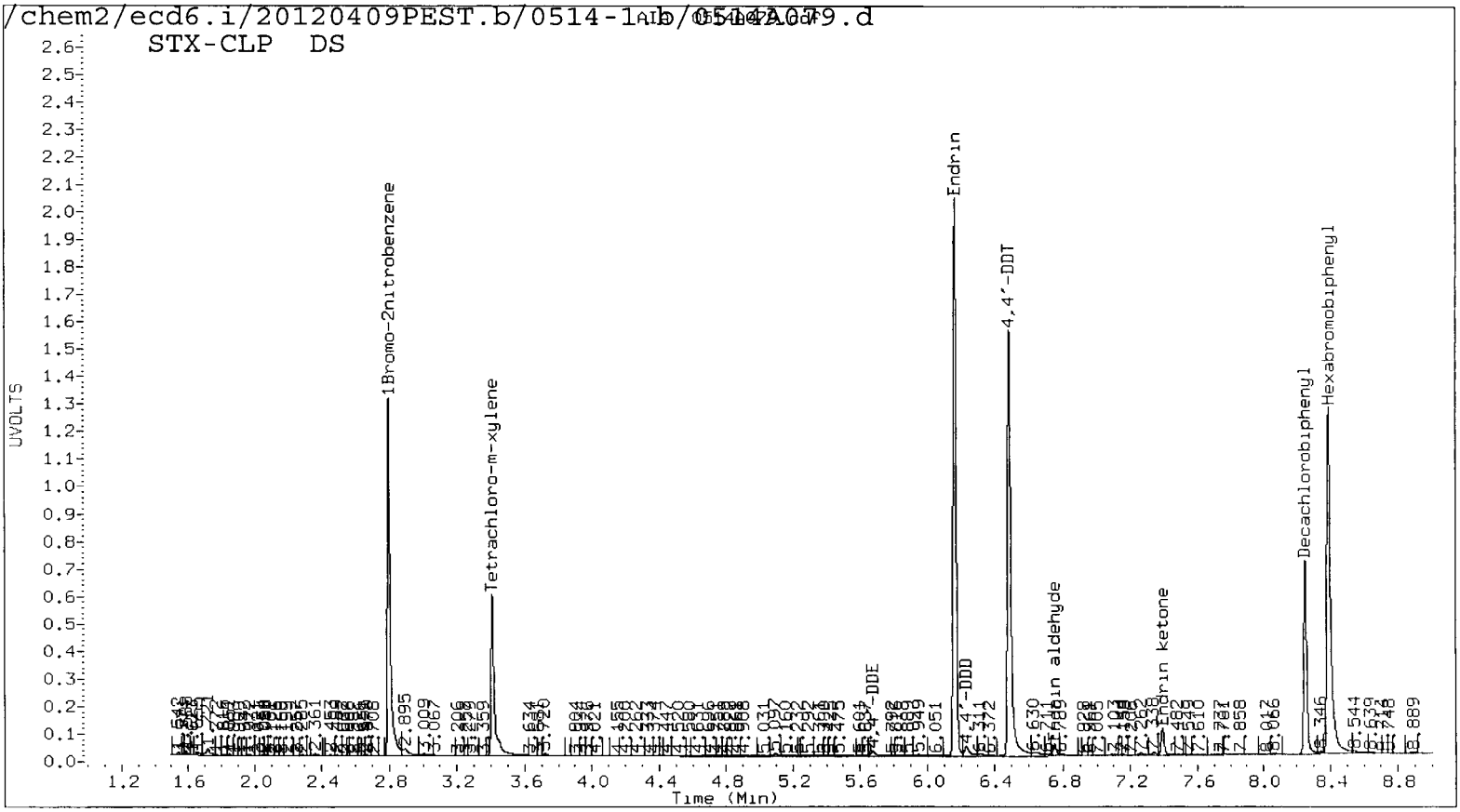
GC Column: STX-CLP2 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.217	387477
Endrin	6.673	9955056
4,4'-DDD	6.758	513495
4,4'-DDT	7.043	8531695
Endrin ketone	7.891	518639
Endrin aldehyde	7.168	324173

DDT Percent Breakdown = 9.6 %
((387477+513495) * 100)/(387477+513495+8531695)

Endrin Percent Breakdown = 7.8 %
((324173+518639) * 100)/(324173+518639+9955056)

Form VII Pest-1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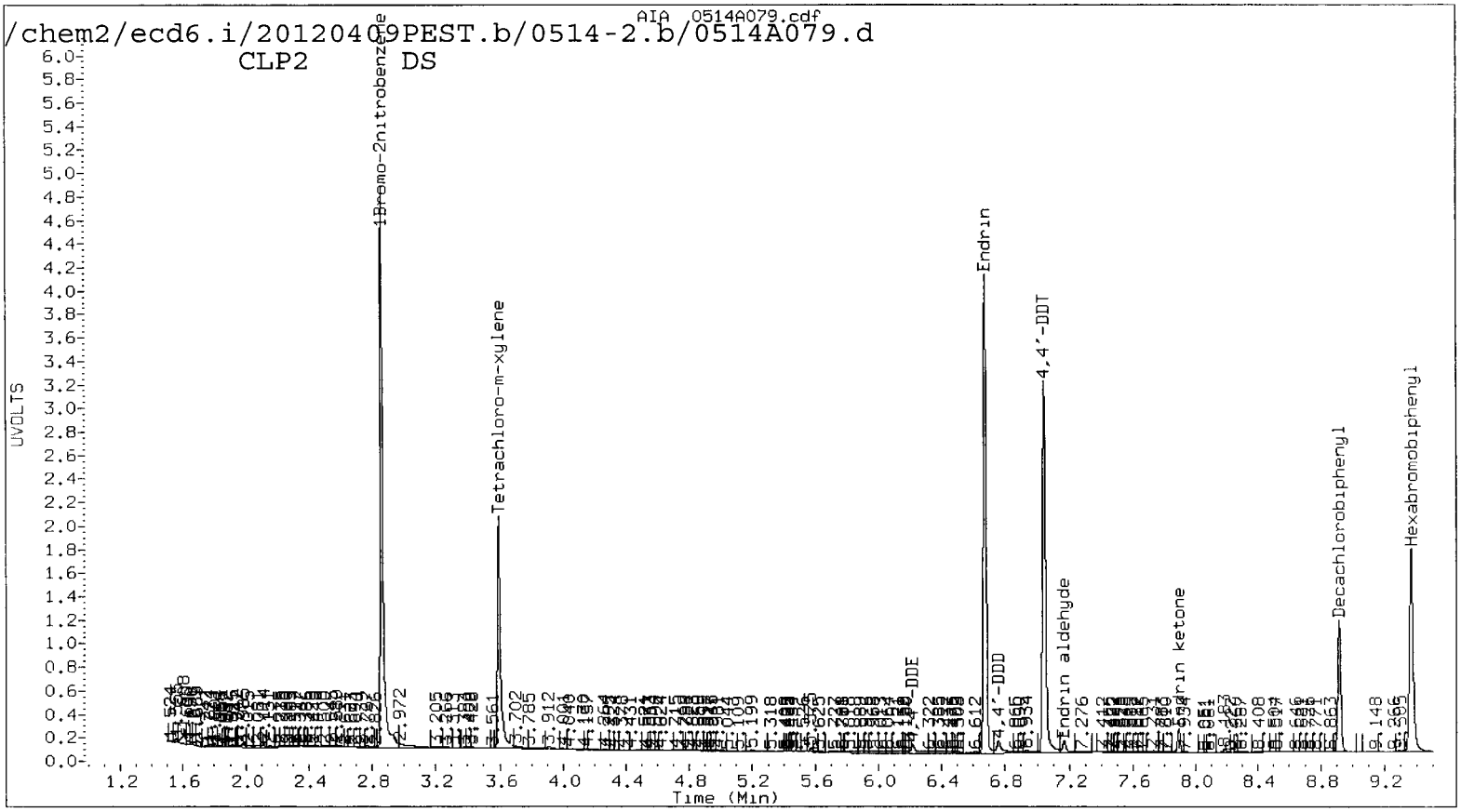
STX-CLP DS
UVOLTS
Time (Min)
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
4,4'-DDE
Endrin
4,4'-DDD
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl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CLP2 DS
UVOLTS
Time (Min)
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
4,4'-DDE
Endrin
4,4'-DDD
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 04/09/12

Lab Ccal ID: INDAE Date/Time Analyzed: 05/15/12,0723

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
alpha-BHC	3.85	3.82	3.92	22.9	20.0	14.6
beta-BHC	4.19	4.16	4.26	23.2	20.0	16.1
delta-BHC	4.34	4.32	4.42	22.0	20.0	10.1
gamma-BHC (Lindane)	4.11	4.08	4.18	22.2	20.0	11.2
Heptachlor	4.52	4.49	4.59	21.9	20.0	9.6
Aldrin	4.79	4.76	4.86	23.9	20.0	19.3
Heptachlor epoxide b	5.35	5.32	5.42	22.7	20.0	13.3
Endosulfan I	5.73	5.69	5.79	19.3	20.0	-3.6
Dieldrin	5.95	5.92	6.02	46.3	40.0	15.7
4,4'-DDE	5.67	5.65	5.75	47.9	40.0	19.8
Endrin	6.17	6.14	6.24	38.0	40.0	-5.0
Endosulfan II	6.37	6.34	6.44	38.2	40.0	-4.5
4,4'-DDD	6.23	6.20	6.30	40.8	40.0	1.9
Endosulfan sulfate	7.14	7.11	7.21	38.0	40.0	-5.0
4,4'-DDT	6.49	6.46	6.56	38.6	40.0	-3.4
Methoxychlor	6.93	6.90	7.00	169.0	200.0	-15.5
Endrin ketone	7.39	7.36	7.46	38.1	40.0	-4.8
Endrin aldehyde	6.75	6.72	6.82	34.2	40.0	-14.4
gamma-Chlordane	5.47	5.44	5.54	23.9	20.0	19.3
alpha-Chlordane	5.60	5.57	5.67	20.3	20.0	1.3
Hexachlorobutadiene	2.05	2.02	2.12	21.4	20.0	6.8
Hexachlorobenzene	3.72	3.69	3.79	21.0	20.0	4.8
Tetrachloro-m-xylene	3.41	3.37	3.47	42.6	40.0	6.6
Decachlorobiphenyl	8.25	8.22	8.32	34.1	40.0	-14.7

FORM VII PEST-2

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 04/09/12

Lab Ccal ID: INDAE Date/Time Analyzed: 05/15/12,0723

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D	
alpha-BHC	4.11	4.09	4.19	22.2	20.0	10.8	
beta-BHC	4.51	4.49	4.59	21.6	20.0	7.8	
delta-BHC	4.79	4.77	4.87	26.5	20.0	32.7	<-
gamma-BHC (Lindane)	4.44	4.41	4.51	23.2	20.0	16.1	
Heptachlor	4.86	4.84	4.94	19.0	20.0	-5.2	
Aldrin	5.18	5.16	5.26	19.8	20.0	-0.8	
Heptachlor epoxide b	5.74	5.72	5.82	22.1	20.0	10.6	
Endosulfan I	6.13	6.11	6.21	21.4	20.0	6.9	
Dieldrin	6.39	6.37	6.47	43.1	40.0	7.8	
4,4'-DDE	6.22	6.20	6.30	44.9	40.0	12.2	
Endrin	6.67	6.66	6.76	42.0	40.0	5.1	
Endosulfan II	6.87	6.85	6.95	42.4	40.0	6.0	
4,4'-DDD	6.76	6.74	6.84	42.7	40.0	6.6	
Endosulfan sulfate	7.41	7.40	7.50	38.8	40.0	-3.0	
4,4'-DDT	7.04	7.02	7.12	40.0	40.0	-0.0	
Methoxychlor	7.64	7.62	7.72	184.2	200.0	-7.9	
Endrin ketone	7.89	7.87	7.97	39.6	40.0	-1.1	
Endrin aldehyde	7.17	7.15	7.25	36.5	40.0	-8.8	
gamma-Chlordane	5.93	5.91	6.01	23.8	20.0	19.0	
alpha-Chlordane	6.07	6.05	6.15	21.6	20.0	8.2	
Hexachlorobutadiene	2.12	2.09	2.19	19.2	20.0	-4.0	
Hexachlorobenzene	4.00	3.98	4.08	23.4	20.0	17.1	
Tetrachloro-m-xylene	3.59	3.57	3.67	44.9	40.0	12.2	
Decachlorobiphenyl	8.92	8.90	9.00	37.5	40.0	-6.2	

FORM VII PEST-2

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 04/09/12

Lab Ccal ID: INDAE Date/Time Analyzed: 05/16/12,0539

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
alpha-BHC	3.85	3.82	3.92	22.8	20.0	14.0
beta-BHC	4.19	4.16	4.26	23.2	20.0	16.2
delta-BHC	4.34	4.32	4.42	21.0	20.0	4.8
gamma-BHC (Lindane)	4.11	4.08	4.18	22.2	20.0	10.9
Heptachlor	4.52	4.49	4.59	22.0	20.0	9.9
Aldrin	4.79	4.76	4.86	23.9	20.0	19.4
Heptachlor epoxide b	5.35	5.32	5.42	22.7	20.0	13.6
Endosulfan I	5.73	5.69	5.79	19.7	20.0	-1.7
Dieldrin	5.95	5.92	6.02	46.8	40.0	16.9
4,4'-DDE	5.67	5.65	5.75	47.5	40.0	18.6
Endrin	6.17	6.14	6.24	37.9	40.0	-5.2
Endosulfan II	6.37	6.34	6.44	38.2	40.0	-4.6
4,4'-DDD	6.23	6.20	6.30	40.3	40.0	0.7
Endosulfan sulfate	7.14	7.11	7.21	36.8	40.0	-8.1
4,4'-DDT	6.49	6.46	6.56	37.4	40.0	-6.4
Methoxychlor	6.93	6.90	7.00	165.9	200.0	-17.0
Endrin ketone	7.39	7.36	7.46	37.8	40.0	-5.5
Endrin aldehyde	6.75	6.72	6.82	33.5	40.0	-16.3
gamma-Chlordane	5.47	5.44	5.54	23.6	20.0	18.2
alpha-Chlordane	5.60	5.57	5.67	20.3	20.0	1.5
Hexachlorobutadiene	2.05	2.02	2.12	21.4	20.0	7.2
Hexachlorobenzene	3.72	3.69	3.79	21.0	20.0	5.0
Tetrachloro-m-xylene	3.41	3.37	3.47	42.9	40.0	7.2
Decachlorobiphenyl	8.25	8.22	8.32	34.3	40.0	-14.2

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 04/09/12

Lab Ccal ID: INDAE Date/Time Analyzed: 05/16/12,0539

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D	
alpha-BHC	4.11	4.09	4.19	21.8	20.0	9.1	
beta-BHC	4.51	4.49	4.59	21.5	20.0	7.5	
delta-BHC	4.79	4.77	4.87	25.3	20.0	26.4	<-
gamma-BHC (Lindane)	4.43	4.41	4.51	22.8	20.0	14.2	
Heptachlor	4.86	4.84	4.94	18.7	20.0	-6.7	
Aldrin	5.18	5.16	5.26	19.7	20.0	-1.5	
Heptachlor epoxide b	5.74	5.72	5.82	22.0	20.0	10.2	
Endosulfan I	6.13	6.11	6.21	21.4	20.0	6.9	
Dieldrin	6.38	6.37	6.47	43.0	40.0	7.6	
4,4'-DDE	6.22	6.20	6.30	45.1	40.0	12.8	
Endrin	6.67	6.66	6.76	41.1	40.0	2.8	
Endosulfan II	6.86	6.85	6.95	41.7	40.0	4.4	
4,4'-DDD	6.76	6.74	6.84	41.5	40.0	3.8	
Endosulfan sulfate	7.41	7.40	7.50	36.9	40.0	-7.7	
4,4'-DDT	7.04	7.02	7.12	38.5	40.0	-3.6	
Methoxychlor	7.64	7.62	7.72	177.7	200.0	-11.1	
Endrin ketone	7.89	7.87	7.97	39.0	40.0	-2.6	
Endrin aldehyde	7.17	7.15	7.25	35.2	40.0	-12.0	
gamma-Chlordane	5.93	5.91	6.01	23.2	20.0	16.0	
alpha-Chlordane	6.07	6.05	6.15	21.7	20.0	8.6	
Hexachlorobutadiene	2.11	2.09	2.19	19.1	20.0	-4.4	
Hexachlorobenzene	4.00	3.98	4.08	23.2	20.0	16.2	
Tetrachloro-m-xylene	3.59	3.57	3.67	44.7	40.0	11.8	
Decachlorobiphenyl	8.92	8.90	9.00	37.3	40.0	-6.7	

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS ARI Job No.: 20120409PEST

Analysis Date: 15-MAY-2012 11:15 Init. Calib. Date: 09-APR-2012

GC Column: STX-CLP1 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	5.677	93651
Endrin	6.167	4385909
4,4'-DDD	6.234	162791
4,4'-DDT	6.489	3918606
Endrin ketone	7.393	253246
Endrin aldehyde	6.753	109229

DDT Percent Breakdown = 6.1 %
((93651+162791) * 100)/(93651+162791+3918606)

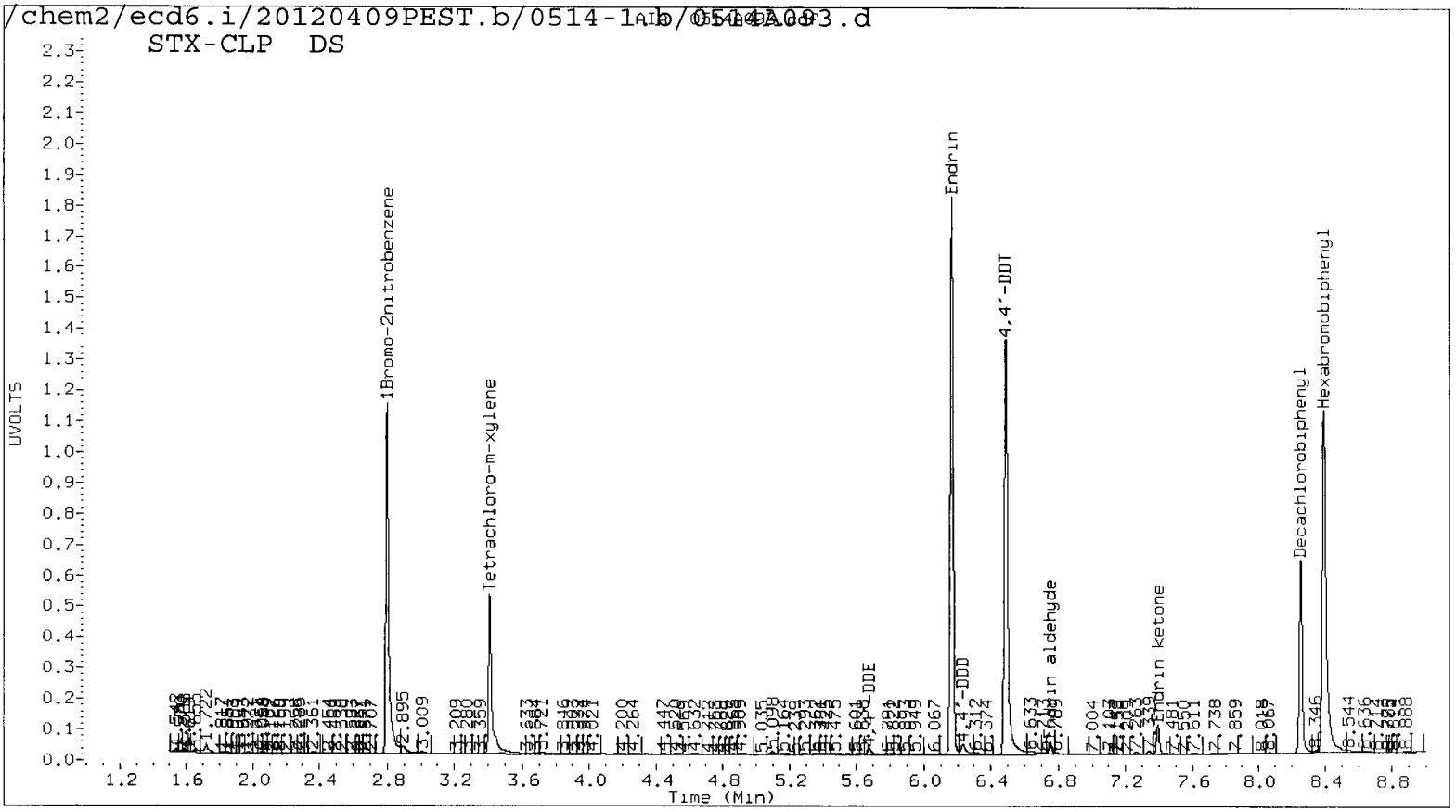
Endrin Percent Breakdown = 7.6 %
((109229+253246) * 100)/(109229+253246+4385909)

GC Column: STX-CLP2 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.218	457236
Endrin	6.674	8588053
4,4'-DDD	6.759	475859
4,4'-DDT	7.045	7273722
Endrin ketone	7.891	545825
Endrin aldehyde	7.168	309570

DDT Percent Breakdown = 11.4 %
((457236+475859) * 100)/(457236+475859+7273722)

Endrin Percent Breakdown = 9.1 %
((309570+545825) * 100)/(309570+545825+8588053)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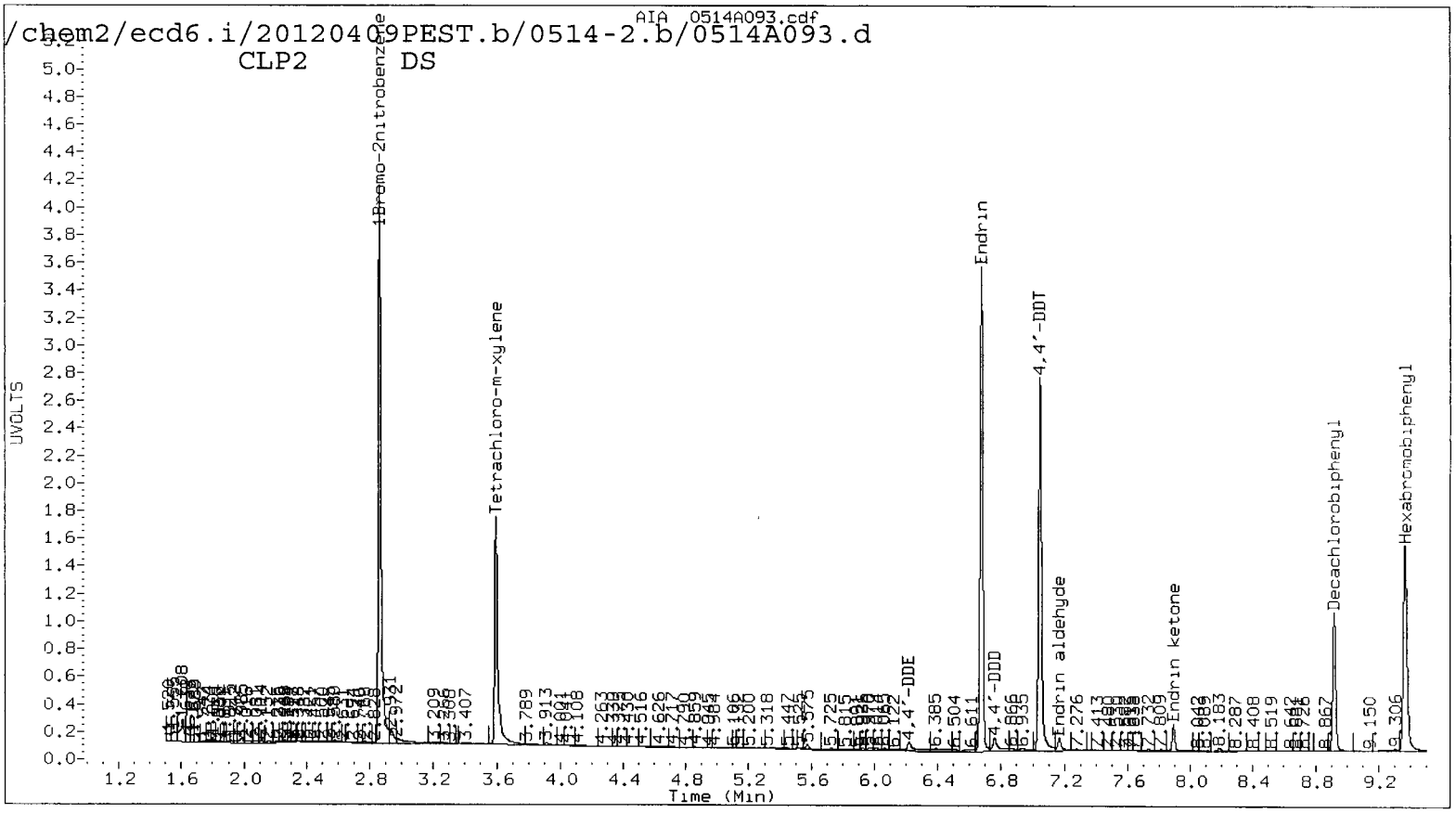
STX-CLP DS
UVOLTS
Time (Min)
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
4,4'-DDE
Endrin
4,4'-DDD
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl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CLP2 DS
UVOLTS
Time (Min)
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
4,4'-DDE
Endrin
4,4'-DDD
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 04/09/12

Lab Ccal ID: INDAE Date/Time Analyzed: 05/15/12,1133

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
alpha-BHC	3.85	3.82	3.92	22.5	20.0	12.7
beta-BHC	4.19	4.16	4.26	22.8	20.0	13.9
delta-BHC	4.34	4.32	4.42	23.7	20.0	18.6
gamma-BHC (Lindane)	4.11	4.08	4.18	22.1	20.0	10.3
Heptachlor	4.52	4.49	4.59	21.6	20.0	8.0
Aldrin	4.79	4.76	4.86	23.8	20.0	18.8
Heptachlor epoxide b	5.35	5.32	5.42	22.6	20.0	13.0
Endosulfan I	5.73	5.69	5.79	19.7	20.0	-1.3
Dieldrin	5.95	5.92	6.02	46.7	40.0	16.7
4,4'-DDE	5.68	5.65	5.75	46.1	40.0	15.3
Endrin	6.17	6.14	6.24	37.8	40.0	-5.6
Endosulfan II	6.37	6.34	6.44	38.3	40.0	-4.3
4,4'-DDD	6.23	6.20	6.30	40.2	40.0	0.4
Endosulfan sulfate	7.14	7.11	7.21	37.7	40.0	-5.8
4,4'-DDT	6.49	6.46	6.56	37.7	40.0	-5.6
Methoxychlor	6.93	6.90	7.00	167.5	200.0	-16.2
Endrin ketone	7.39	7.36	7.46	38.3	40.0	-4.2
Endrin aldehyde	6.75	6.72	6.82	33.9	40.0	-15.2
gamma-Chlordane	5.47	5.44	5.54	23.4	20.0	17.1
alpha-Chlordane	5.60	5.57	5.67	20.1	20.0	0.6
Hexachlorobutadiene	2.05	2.02	2.12	21.4	20.0	7.2
Hexachlorobenzene	3.72	3.69	3.79	20.8	20.0	3.9
Tetrachloro-m-xylene	3.41	3.37	3.47	42.5	40.0	6.3
Decachlorobiphenyl	8.25	8.22	8.32	34.6	40.0	-13.5

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 04/09/12

Lab Ccal ID: INDAE Date/Time Analyzed: 05/15/12,1133

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D	
alpha-BHC	4.12	4.09	4.19	21.9	20.0	9.6	
beta-BHC	4.51	4.49	4.59	21.7	20.0	8.4	
delta-BHC	4.79	4.77	4.87	25.3	20.0	26.5	<-
gamma-BHC (Lindane)	4.44	4.41	4.51	23.0	20.0	14.8	
Heptachlor	4.86	4.84	4.94	19.1	20.0	-4.7	
Aldrin	5.18	5.16	5.26	20.0	20.0	-0.1	
Heptachlor epoxide b	5.74	5.72	5.82	22.4	20.0	12.2	
Endosulfan I	6.13	6.11	6.21	21.6	20.0	7.8	
Dieldrin	6.39	6.37	6.47	43.3	40.0	8.2	
4,4'-DDE	6.22	6.20	6.30	44.6	40.0	11.6	
Endrin	6.67	6.66	6.76	41.7	40.0	4.3	
Endosulfan II	6.87	6.85	6.95	42.5	40.0	6.4	
4,4'-DDD	6.76	6.74	6.84	42.1	40.0	5.2	
Endosulfan sulfate	7.41	7.40	7.50	38.0	40.0	-4.9	
4,4'-DDT	7.04	7.02	7.12	39.2	40.0	-2.0	
Methoxychlor	7.64	7.62	7.72	185.4	200.0	-7.3	
Endrin ketone	7.89	7.87	7.97	39.6	40.0	-1.0	
Endrin aldehyde	7.17	7.15	7.25	36.3	40.0	-9.1	
gamma-Chlordane	5.93	5.91	6.01	21.1	20.0	5.5	
alpha-Chlordane	6.07	6.05	6.15	21.8	20.0	9.0	
Hexachlorobutadiene	2.12	2.09	2.19	19.3	20.0	-3.6	
Hexachlorobenzene	4.00	3.98	4.08	23.3	20.0	16.4	
Tetrachloro-m-xylene	3.59	3.57	3.67	44.7	40.0	11.8	
Decachlorobiphenyl	8.92	8.90	9.00	37.8	40.0	-5.5	

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS ARI Job No.: 20120409PEST

Analysis Date: 15-MAY-2012 16:18 Init. Calib. Date: 09-APR-2012

GC Column: STX-CLP1 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	5.676	68135
Endrin	6.167	4634228
4,4'-DDD	6.234	170539
4,4'-DDT	6.488	4099860
Endrin ketone	7.392	246268
Endrin aldehyde	6.753	106357

DDT Percent Breakdown = 5.5 %
((68135+170539) * 100)/(68135+170539+4099860)

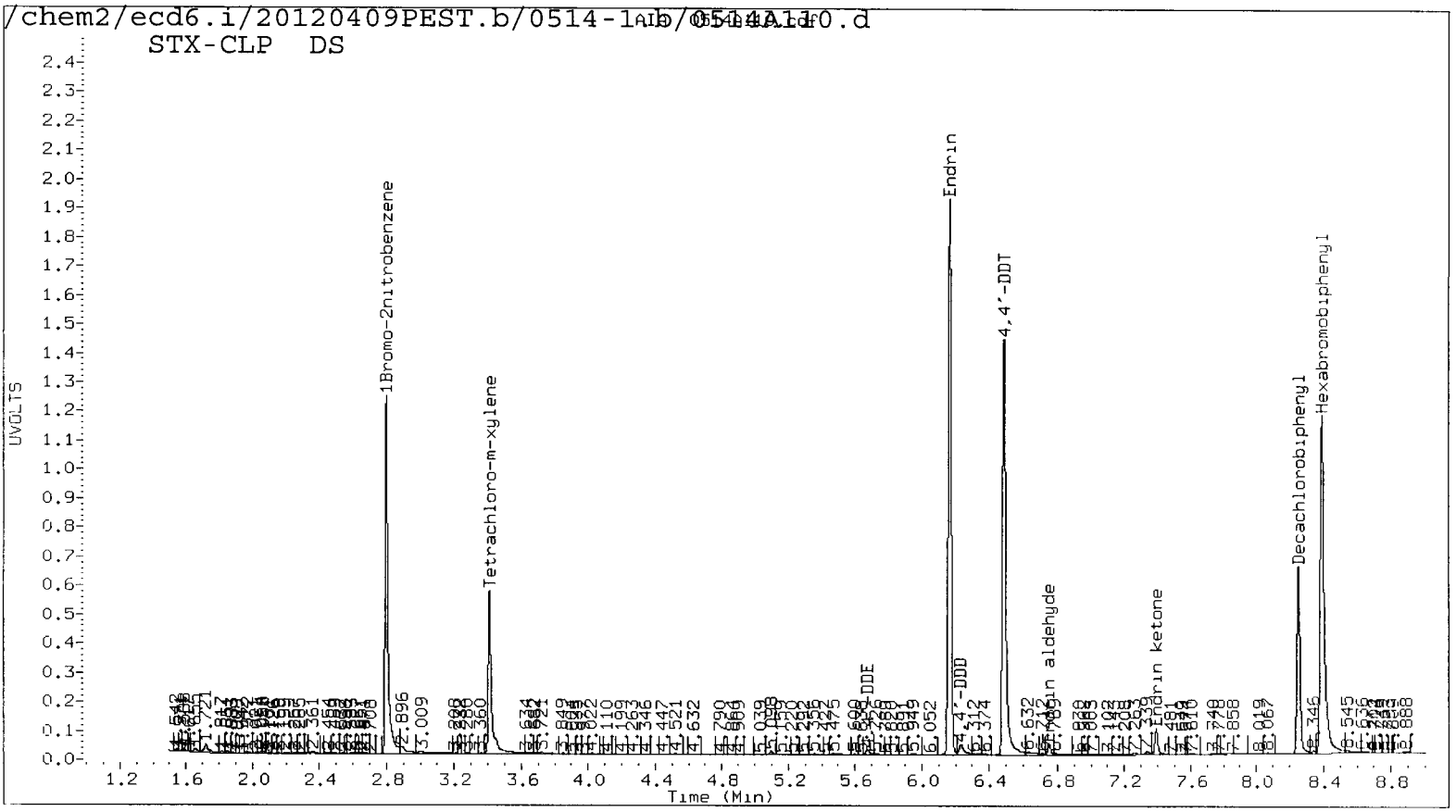
Endrin Percent Breakdown = 7.1 %
((106357+246268) * 100)/(106357+246268+4634228)

GC Column: STX-CLP2 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.217	311097
Endrin	6.674	9055959
4,4'-DDD	6.758	490580
4,4'-DDT	7.044	7498594
Endrin ketone	7.891	462566
Endrin aldehyde	7.168	274206

DDT Percent Breakdown = 9.7 %
((311097+490580) * 100)/(311097+490580+7498594)

Endrin Percent Breakdown = 7.5 %
((274206+462566) * 100)/(274206+462566+9055959)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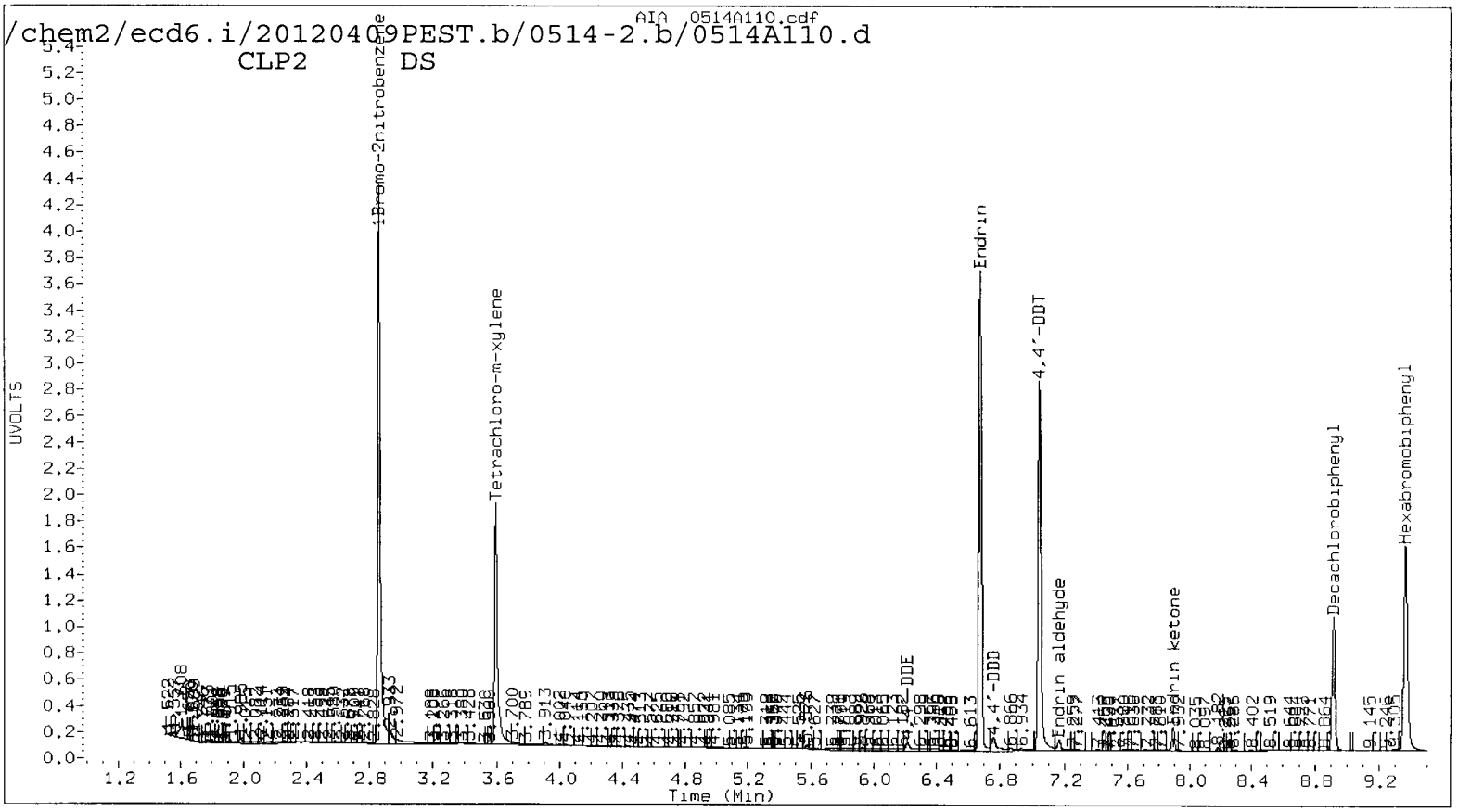
STX-CLP DS
UVOLTS
Time (Min)
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl
DDE
4,4'-DDD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CLP2 DS
UVOLTS
Time (Min)
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl
DDE
4,4'-DDD

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 04/09/12

Lab Ccal ID: INDAE Date/Time Analyzed: 05/15/12,1636

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
alpha-BHC	3.85	3.82	3.92	22.6	20.0	13.1
beta-BHC	4.19	4.16	4.26	23.1	20.0	15.5
delta-BHC	4.34	4.32	4.42	21.3	20.0	6.3
gamma-BHC (Lindane)	4.11	4.08	4.18	22.2	20.0	11.0
Heptachlor	4.52	4.49	4.59	21.8	20.0	9.0
Aldrin	4.79	4.76	4.86	23.6	20.0	18.2
Heptachlor epoxide b	5.35	5.32	5.42	22.4	20.0	12.1
Endosulfan I	5.73	5.69	5.79	19.4	20.0	-3.1
Dieldrin	5.95	5.92	6.02	46.2	40.0	15.4
4,4'-DDE	5.67	5.65	5.75	46.5	40.0	16.3
Endrin	6.17	6.14	6.24	38.8	40.0	-3.1
Endosulfan II	6.37	6.34	6.44	38.4	40.0	-3.9
4,4'-DDD	6.23	6.20	6.30	40.6	40.0	1.6
Endosulfan sulfate	7.14	7.11	7.21	38.0	40.0	-4.9
4,4'-DDT	6.49	6.46	6.56	38.1	40.0	-4.8
Methoxychlor	6.93	6.90	7.00	171.0	200.0	-14.5
Endrin ketone	7.39	7.36	7.46	38.0	40.0	-5.0
Endrin aldehyde	6.75	6.72	6.82	34.3	40.0	-14.3
gamma-Chlordane	5.47	5.44	5.54	23.8	20.0	19.1
alpha-Chlordane	5.60	5.57	5.67	20.1	20.0	0.4
Hexachlorobutadiene	2.05	2.02	2.12	21.6	20.0	8.1
Hexachlorobenzene	3.72	3.69	3.79	20.9	20.0	4.7
Tetrachloro-m-xylene	3.41	3.37	3.47	42.6	40.0	6.4
Decachlorobiphenyl	8.25	8.22	8.32	34.3	40.0	-14.1

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 04/09/12

Lab Ccal ID: INDAE Date/Time Analyzed: 05/15/12,1636

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D	
alpha-BHC	4.11	4.09	4.19	20.9	20.0	4.5	
beta-BHC	4.51	4.49	4.59	20.7	20.0	3.3	
delta-BHC	4.79	4.77	4.87	24.7	20.0	23.5	<-
gamma-BHC (Lindane)	4.44	4.41	4.51	21.9	20.0	9.7	
Heptachlor	4.86	4.84	4.94	18.1	20.0	-9.6	
Aldrin	5.18	5.16	5.26	19.0	20.0	-5.1	
Heptachlor epoxide b	5.74	5.72	5.82	21.3	20.0	6.4	
Endosulfan I	6.13	6.11	6.21	20.5	20.0	2.5	
Dieldrin	6.39	6.37	6.47	41.3	40.0	3.2	
4,4'-DDE	6.22	6.20	6.30	42.7	40.0	6.8	
Endrin	6.67	6.66	6.76	42.3	40.0	5.8	
Endosulfan II	6.87	6.85	6.95	42.5	40.0	6.2	
4,4'-DDD	6.76	6.74	6.84	42.4	40.0	5.9	
Endosulfan sulfate	7.41	7.40	7.50	38.4	40.0	-3.9	
4,4'-DDT	7.04	7.02	7.12	39.3	40.0	-1.8	
Methoxychlor	7.64	7.62	7.72	184.9	200.0	-7.5	
Endrin ketone	7.89	7.87	7.97	39.2	40.0	-2.0	
Endrin aldehyde	7.17	7.15	7.25	36.3	40.0	-9.1	
gamma-Chlordane	5.93	5.91	6.01	23.2	20.0	15.8	
alpha-Chlordane	6.07	6.05	6.15	20.7	20.0	3.7	
Hexachlorobutadiene	2.12	2.09	2.19	18.4	20.0	-7.8	
Hexachlorobenzene	4.00	3.98	4.08	22.3	20.0	11.3	
Tetrachloro-m-xylene	3.59	3.57	3.67	42.9	40.0	7.2	
Decachlorobiphenyl	8.92	8.90	9.00	37.4	40.0	-6.5	

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 04/09/12

Lab Ccal ID: INDAE Date/Time Analyzed: 05/15/12,2138

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
alpha-BHC	3.85	3.82	3.92	22.7	20.0	13.5
beta-BHC	4.19	4.16	4.26	23.2	20.0	15.9
delta-BHC	4.34	4.32	4.42	21.2	20.0	5.9
gamma-BHC (Lindane)	4.11	4.08	4.18	22.3	20.0	11.3
Heptachlor	4.52	4.49	4.59	21.8	20.0	9.2
Aldrin	4.79	4.76	4.86	23.6	20.0	18.1
Heptachlor epoxide b	5.35	5.32	5.42	22.3	20.0	11.6
Endosulfan I	5.73	5.69	5.79	19.3	20.0	-3.7
Dieldrin	5.95	5.92	6.02	46.1	40.0	15.2
4,4'-DDE	5.67	5.65	5.75	46.8	40.0	16.9
Endrin	6.17	6.14	6.24	38.7	40.0	-3.2
Endosulfan II	6.38	6.34	6.44	38.5	40.0	-3.9
4,4'-DDD	6.23	6.20	6.30	40.8	40.0	2.1
Endosulfan sulfate	7.14	7.11	7.21	37.8	40.0	-5.4
4,4'-DDT	6.49	6.46	6.56	37.9	40.0	-5.3
Methoxychlor	6.93	6.90	7.00	169.4	200.0	-15.3
Endrin ketone	7.39	7.36	7.46	37.9	40.0	-5.3
Endrin aldehyde	6.75	6.72	6.82	34.2	40.0	-14.6
gamma-Chlordane	5.47	5.44	5.54	23.6	20.0	18.2
alpha-Chlordane	5.60	5.57	5.67	20.1	20.0	0.3
Hexachlorobutadiene	2.05	2.02	2.12	21.3	20.0	6.6
Hexachlorobenzene	3.72	3.69	3.79	21.0	20.0	5.0
Tetrachloro-m-xylene	3.41	3.37	3.47	42.7	40.0	6.7
Decachlorobiphenyl	8.25	8.22	8.32	34.3	40.0	-14.4

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 04/09/12

Lab Ccal ID: INDAE Date/Time Analyzed: 05/15/12,2138

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D	
alpha-BHC	4.11	4.09	4.19	22.1	20.0	10.3	
beta-BHC	4.51	4.49	4.59	21.6	20.0	7.9	
delta-BHC	4.79	4.77	4.87	26.1	20.0	30.5	<-
gamma-BHC (Lindane)	4.44	4.41	4.51	23.1	20.0	15.4	
Heptachlor	4.86	4.84	4.94	18.9	20.0	-5.5	
Aldrin	5.18	5.16	5.26	19.9	20.0	-0.7	
Heptachlor epoxide b	5.74	5.72	5.82	22.5	20.0	12.7	
Endosulfan I	6.13	6.11	6.21	21.4	20.0	6.8	
Dieldrin	6.39	6.37	6.47	42.9	40.0	7.2	
4,4'-DDE	6.22	6.20	6.30	44.6	40.0	11.5	
Endrin	6.67	6.66	6.76	42.5	40.0	6.2	
Endosulfan II	6.87	6.85	6.95	42.6	40.0	6.5	
4,4'-DDD	6.76	6.74	6.84	42.6	40.0	6.4	
Endosulfan sulfate	7.41	7.40	7.50	38.2	40.0	-4.4	
4,4'-DDT	7.04	7.02	7.12	39.1	40.0	-2.2	
Methoxychlor	7.64	7.62	7.72	183.0	200.0	-8.5	
Endrin ketone	7.89	7.87	7.97	39.0	40.0	-2.4	
Endrin aldehyde	7.17	7.15	7.25	36.3	40.0	-9.3	
gamma-Chlordane	5.93	5.91	6.01	23.8	20.0	19.1	
alpha-Chlordane	6.07	6.05	6.15	21.6	20.0	7.9	
Hexachlorobutadiene	2.12	2.09	2.19	19.2	20.0	-4.1	
Hexachlorobenzene	4.00	3.98	4.08	23.5	20.0	17.4	
Tetrachloro-m-xylene	3.59	3.57	3.67	45.0	40.0	12.5	
Decachlorobiphenyl	8.92	8.90	9.00	37.2	40.0	-7.1	

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS ARI Job No.: 20120409PEST

Analysis Date: 16-MAY-2012 05:21 Init. Calib. Date: 09-APR-2012

GC Column: STX-CLP1 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	5.676	79870
Endrin	6.167	4648175
4,4'-DDD	6.233	183149
4,4'-DDT	6.488	4095220
Endrin ketone	7.392	292266
Endrin aldehyde	6.753	135797

DDT Percent Breakdown = 6.0 %
((79870+183149) * 100)/(79870+183149+4095220)

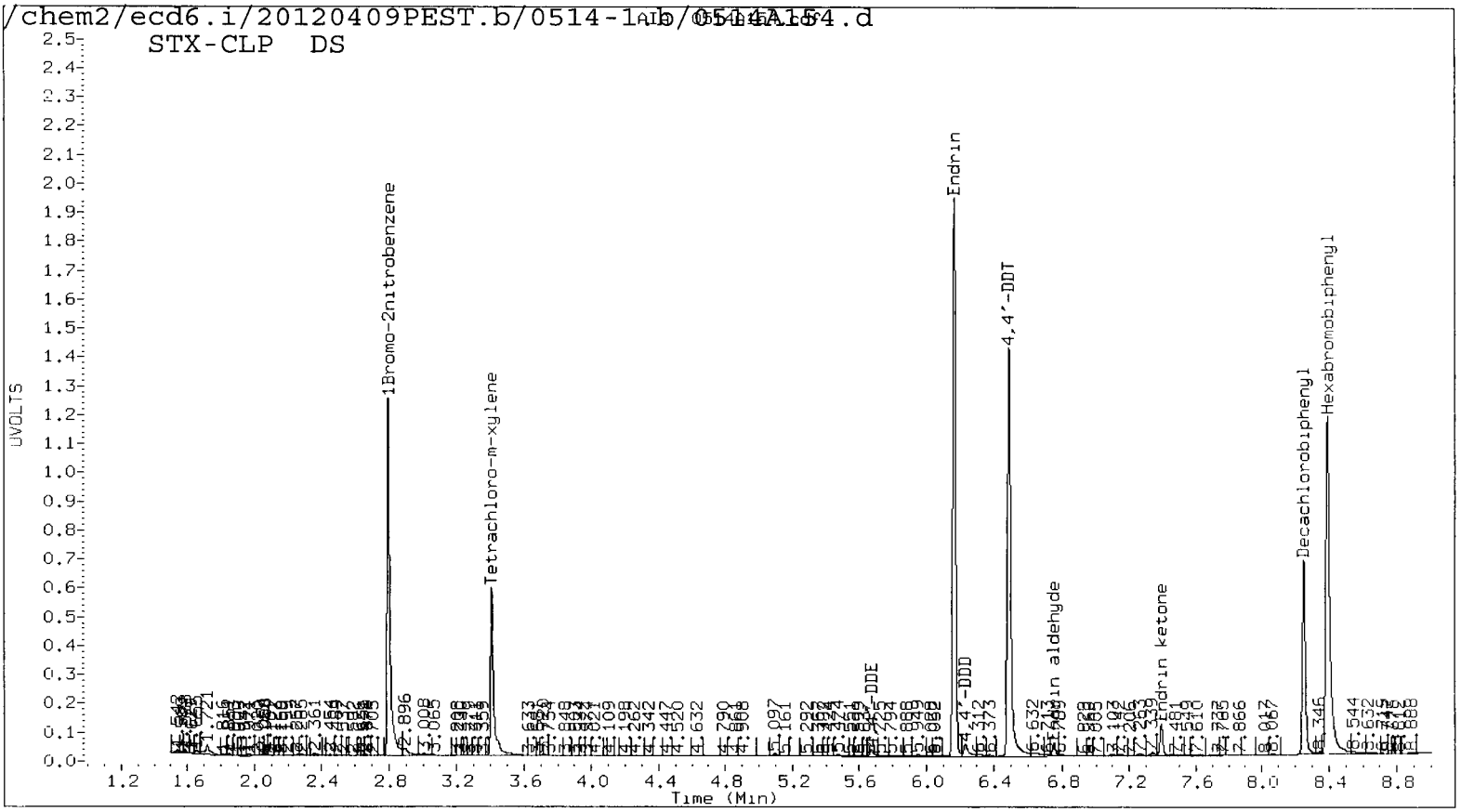
Endrin Percent Breakdown = 8.4 %
((135797+292266) * 100)/(135797+292266+4648175)

GC Column: STX-CLP2 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.217	507266
Endrin	6.672	9557188
4,4'-DDD	6.757	570496
4,4'-DDT	7.042	8014254
Endrin ketone	7.890	574866
Endrin aldehyde	7.166	357989

DDT Percent Breakdown = 11.9 %
((507266+570496) * 100)/(507266+570496+8014254)

Endrin Percent Breakdown = 8.9 %
((357989+574866) * 100)/(357989+574866+9557188)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STX-CLP DS
UVOLTS
Time (Min)
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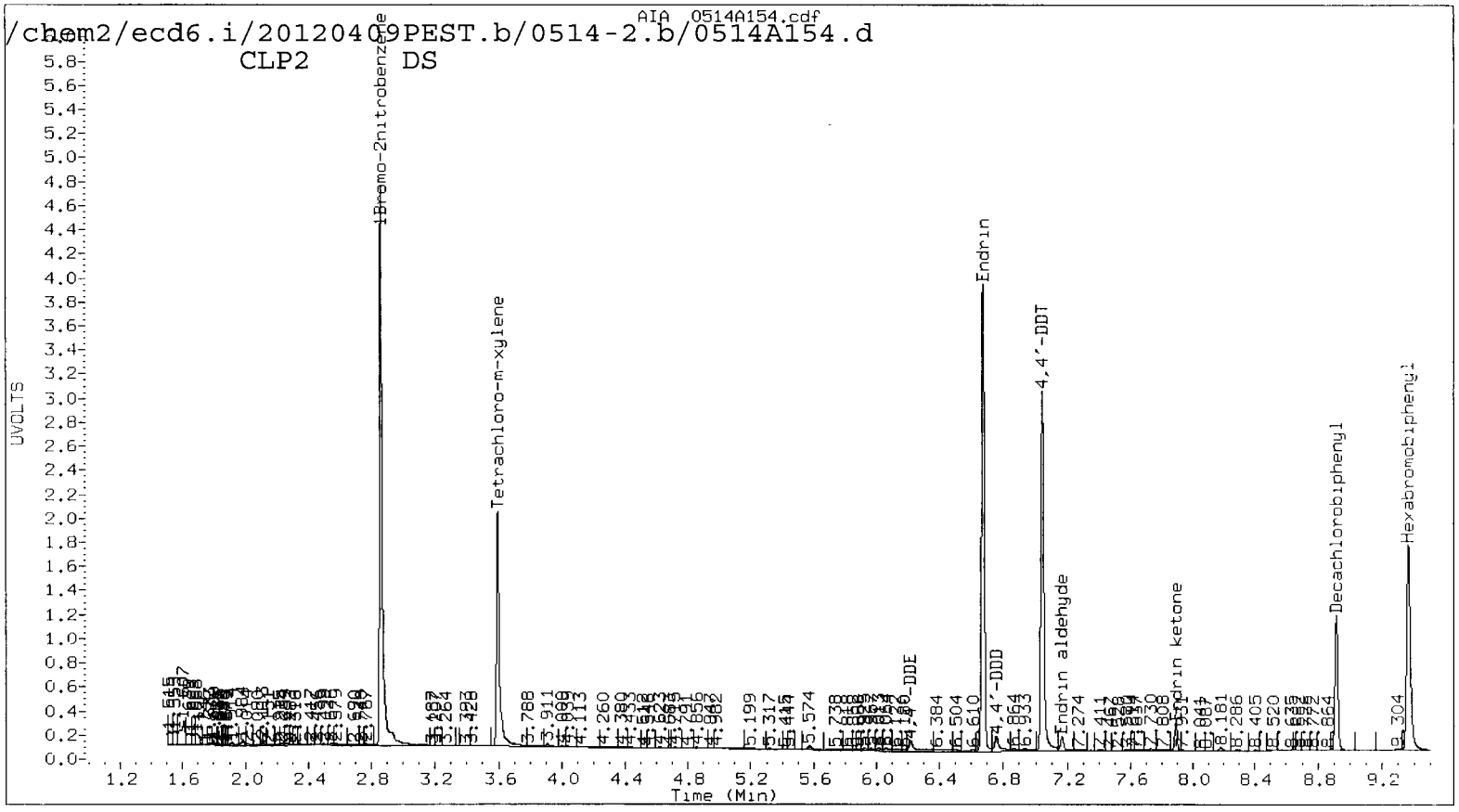
Tetrachloro-m-xylene
DDE
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl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CLP2 DS
UVOLTS
Time (Min)
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Tetrachloro-m-xylene
DDE
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS ARI Job No.: 20120409PEST

Analysis Date: 16-MAY-2012 10:06 Init. Calib. Date: 09-APR-2012

GC Column: STX-CLP1 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	5.672	41239
Endrin	6.167	4805660
4,4'-DDD	6.230	834443
4,4'-DDT	6.487	2586312
Endrin ketone	7.392	364985
Endrin aldehyde	6.752	60175

DDT Percent Breakdown = 25.3 %
((41239+834443) * 100)/(41239+834443+2586312)

Endrin Percent Breakdown = 8.1 %
((60175+364985) * 100)/(60175+364985+4805660)

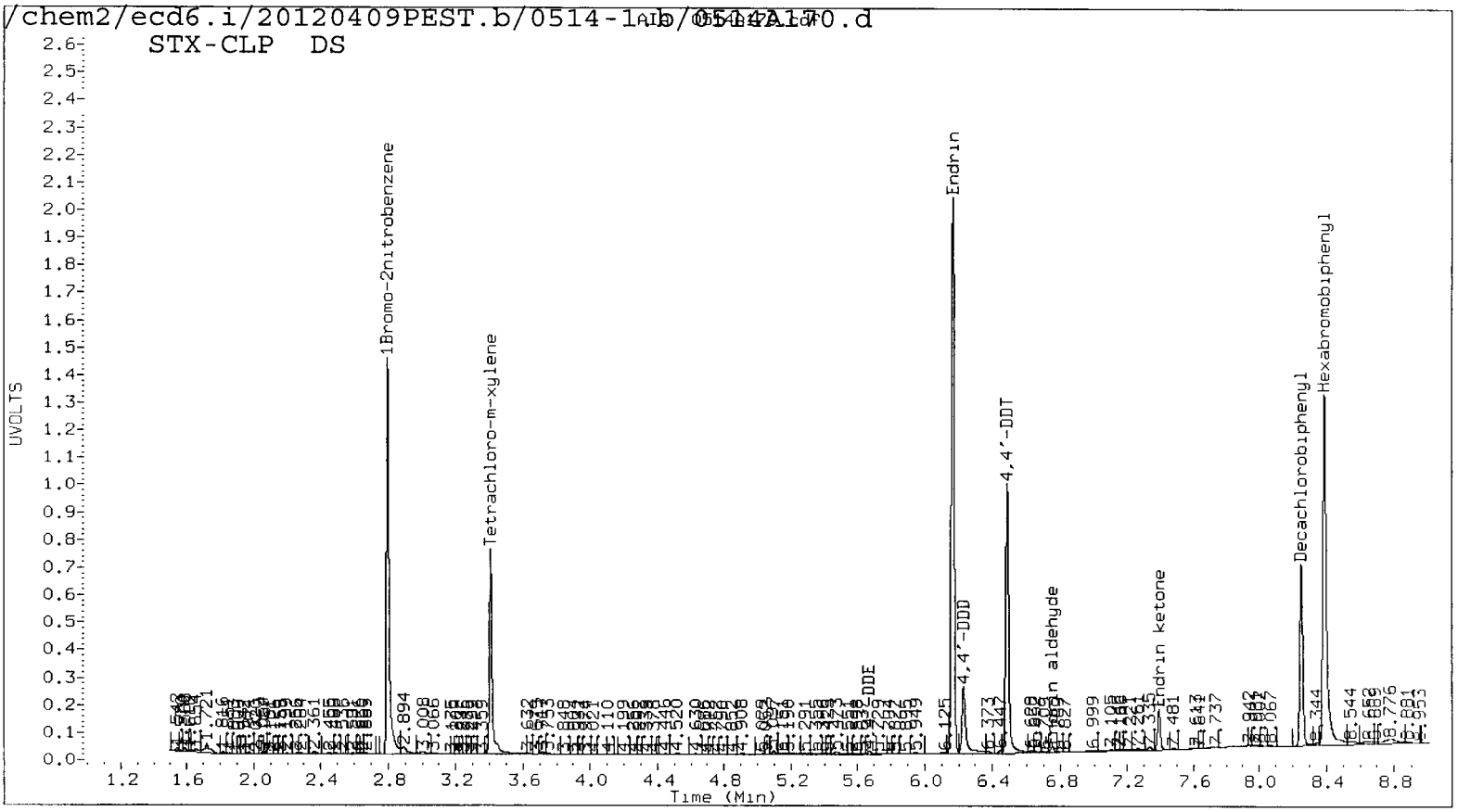
GC Column: STX-CLP2 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.214	204382
Endrin	6.672	8505936
4,4'-DDD	6.756	1595840
4,4'-DDT	7.041	4228635
Endrin ketone	7.889	656185
Endrin aldehyde	7.166	141091

DDT Percent Breakdown = 29.9 %
((204382+1595840) * 100)/(204382+1595840+4228635)

Endrin Percent Breakdown = 8.6 %
((141091+656185) * 100)/(141091+656185+8505936)

Form VII Pest-1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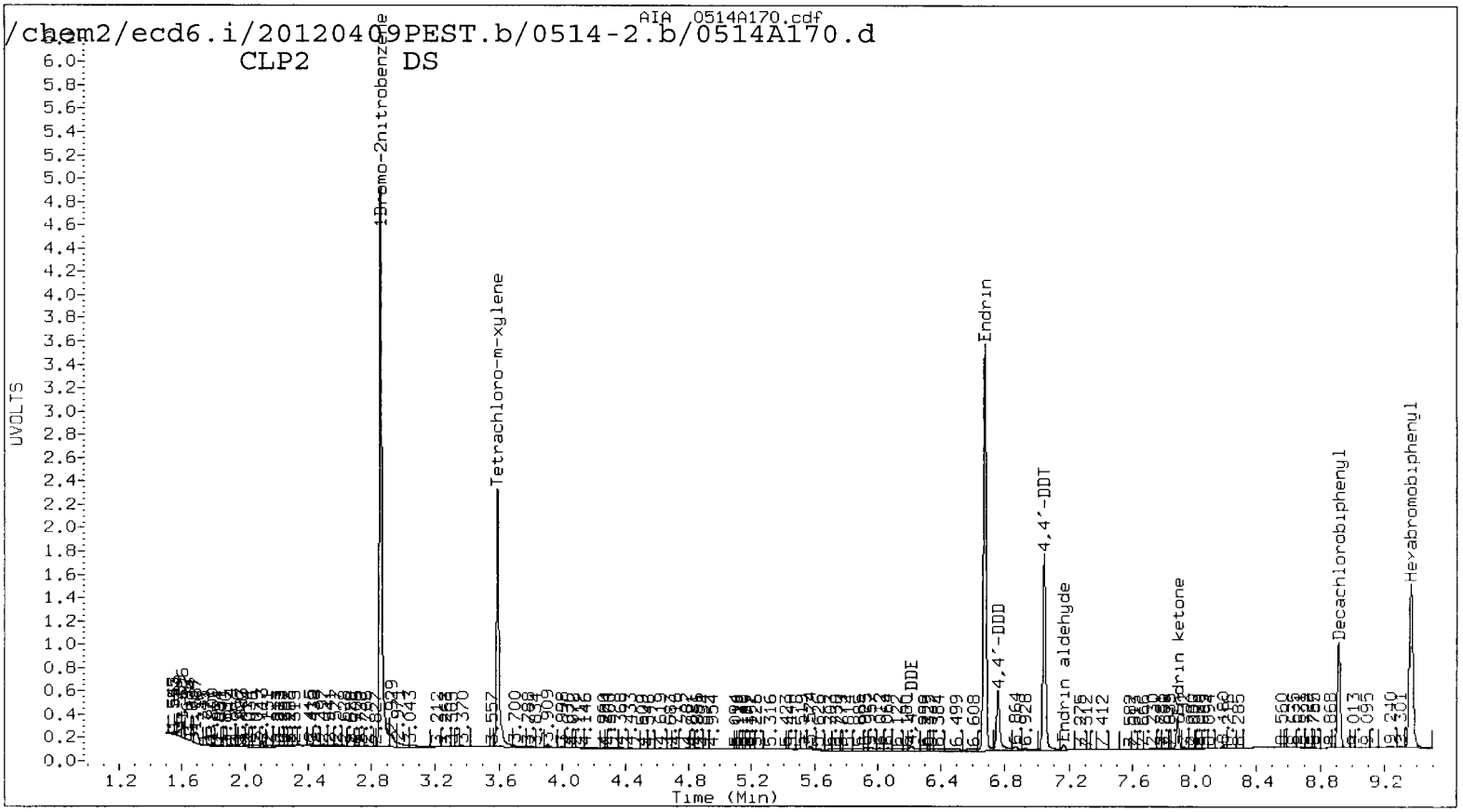
STX-CLP DS
UVOLTS
Time (Min)
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
DDE
4,4'-DDD
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl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CLP2 DS
UVOLTS
Time (Min)
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
DDE
4,4'-DDD
Endrin
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl

7E

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP1 ID: 0.53 (mm)

Init. Calib. Date: 04/09/12

Lab Ccal ID: INDAE Date/Time Analyzed: 05/16/12,1024

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D	
alpha-BHC	3.85	3.82	3.92	22.4	20.0	11.9	
beta-BHC	4.18	4.16	4.26	21.3	20.0	6.7	
delta-BHC	4.34	4.32	4.42	23.8	20.0	19.1	
gamma-BHC (Lindane)	4.11	4.08	4.18	22.6	20.0	13.0	
Heptachlor	4.52	4.49	4.59	20.0	20.0	0.1	
Aldrin	4.79	4.76	4.86	23.1	20.0	15.6	
Heptachlor epoxide b	5.35	5.32	5.42	22.2	20.0	11.0	
Endosulfan I	5.72	5.69	5.79	18.2	20.0	-8.8	
Dieldrin	5.95	5.92	6.02	45.2	40.0	12.9	
4,4'-DDE	5.67	5.65	5.75	48.3	40.0	20.7	<-
Endrin	6.17	6.14	6.24	40.4	40.0	1.1	
Endosulfan II	6.37	6.34	6.44	40.5	40.0	1.3	
4,4'-DDD	6.23	6.20	6.30	50.7	40.0	26.6	<-
Endosulfan sulfate	7.14	7.11	7.21	39.5	40.0	-1.3	
4,4'-DDT	6.49	6.46	6.56	24.6	40.0	-38.6	<-
Methoxychlor	6.93	6.90	7.00	122.1	200.0	-39.0	<-
Endrin ketone	7.39	7.36	7.46	36.0	40.0	-10.0	
Endrin aldehyde	6.75	6.72	6.82	34.4	40.0	-14.0	
gamma-Chlordane	5.47	5.44	5.54	24.7	20.0	23.4	<-
alpha-Chlordane	5.60	5.57	5.67	20.1	20.0	0.3	
Hexachlorobutadiene	2.05	2.02	2.12	21.1	20.0	5.6	
Hexachlorobenzene	3.72	3.69	3.79	21.0	20.0	4.8	
Tetrachloro-m-xylene	3.41	3.37	3.47	37.8	40.0	-5.4	
Decachlorobiphenyl	8.25	8.22	8.32	33.6	40.0	-15.9	

FORM VII PEST-2

8081 PESTICIDE CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP2 ID: 0.53 (mm)

Init. Calib. Date: 04/09/12

Lab Ccal ID: INDAE Date/Time Analyzed: 05/16/12,1024

PEST MIX COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ug/L)	NOM AMOUNT (ug/L)	%D	
alpha-BHC	4.11	4.09	4.19	21.8	20.0	9.2	
beta-BHC	4.51	4.49	4.59	20.9	20.0	4.3	
delta-BHC	4.79	4.77	4.87	27.7	20.0	38.7	<-
gamma-BHC (Lindane)	4.43	4.41	4.51	22.9	20.0	14.6	
Heptachlor	4.86	4.84	4.94	17.3	20.0	-13.5	
Aldrin	5.18	5.16	5.26	19.3	20.0	-3.7	
Heptachlor epoxide b	5.74	5.72	5.82	20.7	20.0	3.5	
Endosulfan I	6.12	6.11	6.21	20.4	20.0	2.0	
Dieldrin	6.38	6.37	6.47	40.6	40.0	1.6	
4,4'-DDE	6.21	6.20	6.30	43.3	40.0	8.2	
Endrin	6.67	6.66	6.76	45.5	40.0	13.6	
Endosulfan II	6.86	6.85	6.95	47.6	40.0	19.0	
4,4'-DDD	6.75	6.74	6.84	54.2	40.0	35.4	<-
Endosulfan sulfate	7.41	7.40	7.50	41.9	40.0	4.7	
4,4'-DDT	7.04	7.02	7.12	25.9	40.0	-35.3	<-
Methoxychlor	7.64	7.62	7.72	133.9	200.0	-33.0	<-
Endrin ketone	7.89	7.87	7.97	37.0	40.0	-7.5	
Endrin aldehyde	7.17	7.15	7.25	37.8	40.0	-5.5	
gamma-Chlordane	5.93	5.91	6.01	22.8	20.0	13.9	
alpha-Chlordane	6.06	6.05	6.15	20.6	20.0	3.1	
Hexachlorobutadiene	2.11	2.09	2.19	19.0	20.0	-4.8	
Hexachlorobenzene	4.00	3.98	4.08	23.5	20.0	17.6	
Tetrachloro-m-xylene	3.59	3.57	3.67	44.8	40.0	12.0	
Decachlorobiphenyl	8.92	8.90	9.00	37.2	40.0	-7.1	

7E

8081 DDT/ENDRIN BREAKDOWN VERIFICATION SUMMARY

Lab ID: DS ARI Job No.: 20120409PEST

Analysis Date: 16-MAY-2012 12:29 Init. Calib. Date: 09-APR-2012

GC Column: STX-CLP1 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	5.671	42270
Endrin	6.167	4561687
4,4'-DDD	6.229	959780
4,4'-DDT	6.486	1957789
Endrin ketone	7.392	428090
Endrin aldehyde	6.752	31909

DDT Percent Breakdown = 33.9 %
((42270+959780) * 100)/(42270+959780+1957789)

Endrin Percent Breakdown = 9.2 %
((31909+428090) * 100)/(31909+428090+4561687)

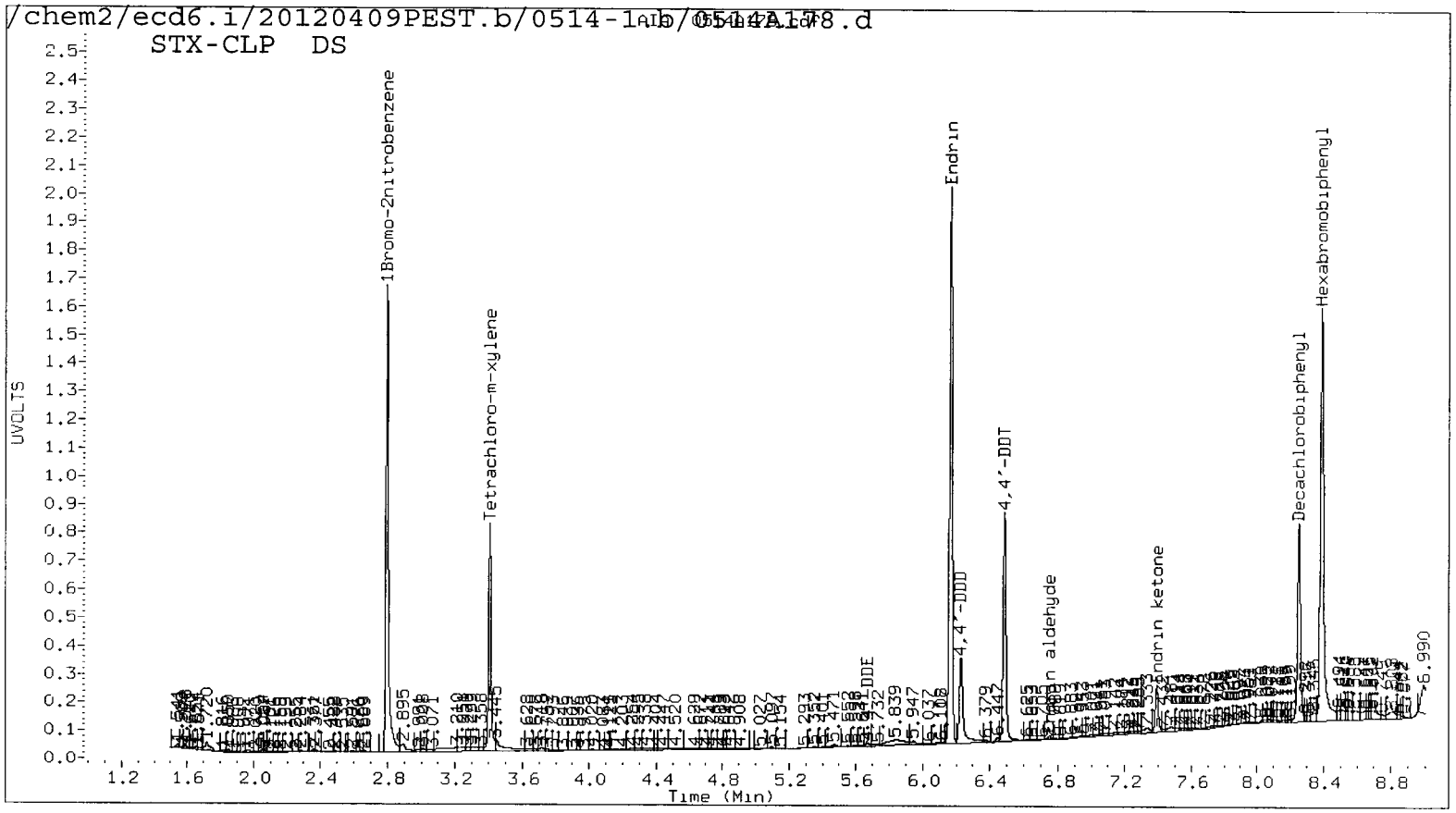
GC Column: STX-CLP2 ID: 0.53(mm)

COMPOUND	RT	AREA
4,4'-DDE	6.213	83770
Endrin	6.672	6131985
4,4'-DDD	6.755	1320675
4,4'-DDT	7.041	2329058
Endrin ketone	7.889	579386
Endrin aldehyde	7.167	964579

DDT Percent Breakdown = 37.6 %
((83770+1320675) * 100)/(83770+1320675+2329058)

Endrin Percent Breakdown = 20.1 %
((964579+579386) * 100)/(964579+579386+6131985)

Form VII Pest-1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STX-CLP DS
UVOLTS
Time (Min)
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
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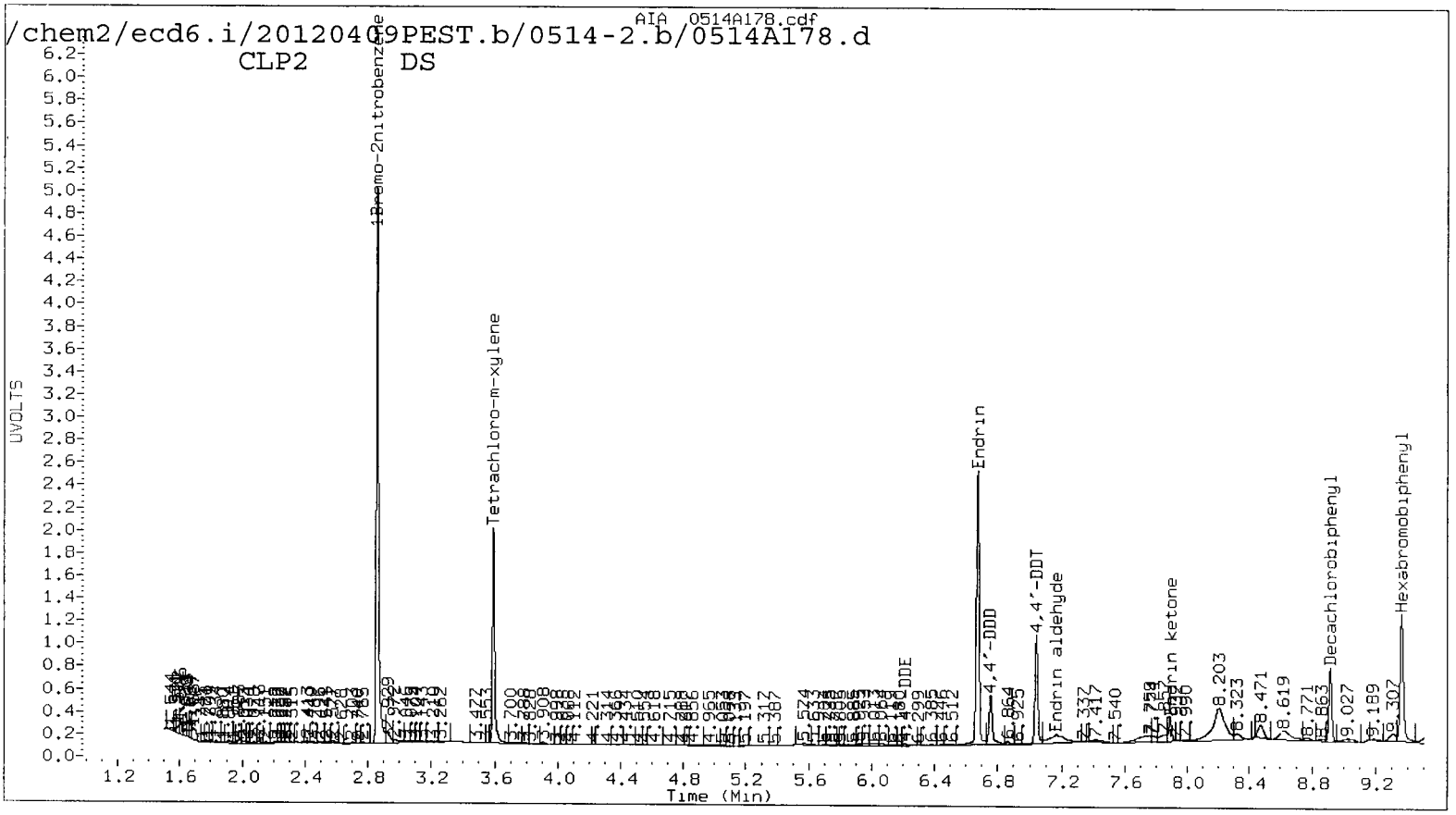
Endrin
4,4'-DDD
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl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CLP2 DS
UVOLTS
Time (Min)
1Bromo-2nitrobenzene
Tetrachloro-m-xylene
4,4'-DDE
Endrin
4,4'-DDD
4,4'-DDT
Endrin aldehyde
Endrin ketone
Decachlorobiphenyl
Hexabromobiphenyl

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP1 ID: 0.53(mm) Instrument ID: ECD6

Init. Calib. Date: 04/09/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

			IS1 AREA	RT	IS2 AREA	RT
		ICAL MIDPT	4065981	2.814	5201182	8.422
		UPPER LIMIT	8131962	2.864	10402364	8.472
		LOWER LIMIT	2032990	2.764	2600591	8.372

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01		DS 1878-2	04/09/12	1604	4180862	2.814	4997426	8.421
02	ZZZZZ	ZZZZZ	04/09/12	1622	4384393	2.814	5303728	8.419
03		INDAE 1922-5	04/09/12	1640	4065981	2.814	5201182	8.422
04		INDAA	04/09/12	1658	4331944	2.814	5237996	8.423
05		INDAB	04/09/12	1715	4011658	2.814	4909286	8.424
06		INDAC	04/09/12	1733	4035775	2.815	4959976	8.423
07		INDAD	04/09/12	1751	3727447	2.814	4581822	8.423
08		INDAF	04/09/12	1809	3776224	2.814	4668865	8.422
09		INDAG	04/09/12	1827	3636146	2.814	4515836	8.421
10	ZZZZZ	ZZZZZ	04/09/12	1844	4021979	2.814	5172803	8.414
11	ZZZZZ	ZZZZZ	04/09/12	1902	4282083	2.812	5492520	8.409
12		TOXAPH 1924-	04/09/12	1920	4085909	2.814	5016891	8.423
13		WNDE 1938-1	04/09/12	1938	3956891	2.815	4785711	8.424
14		WNDA	04/09/12	1956	4240372	2.814	5212711	8.421
15		WNDB	04/09/12	2013	4297467	2.815	5318442	8.422
16		WNDC	04/09/12	2031	4362697	2.814	5372628	8.422
17		WNDD	04/09/12	2049	4529122	2.814	5473634	8.421
18		WNDF	04/09/12	2107	4111764	2.814	5001246	8.421
19		WNDG	04/09/12	2125	4279954	2.814	5299972	8.421
20	ZZZZZ	ZZZZZ	04/09/12	2142	4253819	2.814	5183779	8.423
21	ZZZZZ	ZZZZZ	04/09/12	2200	4208844	2.814	5204235	8.421
22	ZZZZZ	ZZZZZ	04/09/12	2218	4375060	2.814	5349331	8.423
23		DS	05/15/12	0706	3054487	2.798	4204814	8.393
24		INDAE	05/15/12	0723	3017422	2.798	4422107	8.392
25		TOXAPH 2500	05/15/12	0741	3305158	2.799	4728423	8.393
26		WNDE	05/15/12	0759	3268286	2.798	4443997	8.392
27	UU16MBS1	UU16MBS1	05/15/12	0817	5214091	2.796	7297022	8.389
28	UU16LCSS1	UU16LCSS1	05/15/12	0835	4997045	2.796	7001141	8.389
29	UU16LCSDS1	UU16LCSDS1	05/15/12	0852	5077279	2.797	7210521	8.389
30	ZZZZZ	ZZZZZ	05/15/12	0910	4690079	2.799	6643359	8.394
31	ZZZZZ	ZZZZZ	05/15/12	0928	4663469	2.800	6997860	8.393
32	ZZZZZ	ZZZZZ	05/15/12	0946	4611532	2.799	6935629	8.393
33	ZZZZZ	ZZZZZ	05/15/12	1004	6568877	2.796	7189610	8.392
34	ZZZZZ	ZZZZZ	05/15/12	1022	6524610	2.797	7156899	8.391
35	ZZZZZ	ZZZZZ	05/15/12	1039	2796056	2.799	4030503	8.392

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min
IS2 = Hexabromobiphenyl

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP1 ID: 0.53(mm) Instrument ID: ECD6

Init. Calib. Date: 04/09/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

		IS1 AREA	RT	IS2 AREA	RT
	ICAL MIDPT	4065981	2.814	5201182	8.422
	UPPER LIMIT	8131962	2.864	10402364	8.472
	LOWER LIMIT	2032990	2.764	2600591	8.372

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
36	ZZZZZ	ZZZZZ	05/15/12	1057	2858021	2.799	4159388	8.393
37		DS	05/15/12	1115	2739259	2.799	3800500	8.393
38		INDAE	05/15/12	1133	2463540	2.800	3619327	8.392
39		TOXAPH 2500	05/15/12	1151	3159520	2.799	4562089	8.393
40		WNDE	05/15/12	1209	2782628	2.799	3983591	8.394
41	ZZZZZ	ZZZZZ	05/15/12	1226	5145283	2.800	7402348	8.394
42	ZZZZZ	ZZZZZ	05/15/12	1244	5091761	2.797	7755843	8.389
43	ZZZZZ	ZZZZZ	05/15/12	1302	5588062	2.796	9144284	8.388
44	ZZZZZ	ZZZZZ	05/15/12	1320	5626862	2.796	7608170	8.387
45	ZZZZZ	ZZZZZ	05/15/12	1338	5195019	2.795	7351207	8.388
46	ZZZZZ	ZZZZZ	05/15/12	1355	6072000	2.797	7843229	8.389
47	401A/DP	UU16A	05/15/12	1413	4487632	2.796	6521611	8.388
48	401B/DP	UU16B	05/15/12	1431	4582211	2.797	6603421	8.387
49	401C/DP	UU16C	05/15/12	1449	4611229	2.797	6569947	8.388
50	401A/NSM	UU16D	05/15/12	1507	4458700	2.797	6477685	8.387
51	ZZZZZ	ZZZZZ	05/15/12	1524	6726913	2.796	6773428	8.391
52	ZZZZZ	ZZZZZ	05/15/12	1542	2992799	2.798	4224598	8.393
53	ZZZZZ	ZZZZZ	05/15/12	1600	2848908	2.799	4037026	8.392
54		DS	05/15/12	1618	2869659	2.799	3898388	8.393
55		INDAE	05/15/12	1636	2570880	2.799	3717399	8.393
56		TOXAPH 2500	05/15/12	1653	3173168	2.799	4505678	8.393
57		WNDE	05/15/12	1711	2904859	2.799	4053456	8.393
58	401B/NSM	UU16E	05/15/12	1729	5184125	2.797	7257466	8.389
59	401C/NSM	UU16F	05/15/12	1747	4502442	2.797	6453888	8.388
60	410A/DP	UU16G	05/15/12	1805	4623765	2.797	6667178	8.388
61	410B/DP	UU16H	05/15/12	1822	4561395	2.797	6473309	8.388
62	410C/DP	UU16I	05/15/12	1840	4535820	2.797	6755389	8.387
63	410A/NSM	UU16J	05/15/12	1858	4560770	2.796	6542190	8.388
64	410B/NSM	UU16K	05/15/12	1916	4596453	2.797	6643756	8.387
65	410B/NSM MS	UU16KMS	05/15/12	1934	4552648	2.797	6574579	8.387
66	410B/NSM MSD	UU16KMSD	05/15/12	1952	4564362	2.797	6657060	8.387
67	410C/NSM	UU16L	05/15/12	2009	4295027	2.797	6072295	8.388
68	ZZZZZ	ZZZZZ	05/15/12	2027	6616908	2.797	7088845	8.392
69	ZZZZZ	ZZZZZ	05/15/12	2045	2919624	2.799	4117517	8.392
70	ZZZZZ	ZZZZZ	05/15/12	2103	3024971	2.799	4372598	8.393

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min
IS2 = Hexabromobiphenyl

FORM 8

PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP1 ID: 0.53(mm) Instrument ID: ECD6

Init. Calib. Date: 04/09/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
				ICAL MIDPT	4065981	2.814	5201182	8.422
				UPPER LIMIT	8131962	2.864	10402364	8.472
				LOWER LIMIT	2032990	2.764	2600591	8.372
	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
71		DS	05/15/12	2121	2916735	2.799	3993060	8.393
72		INDAE	05/15/12	2138	2663840	2.799	3844567	8.393
73		DS	05/16/12	0521	2912747	2.798	4032449	8.393
74		INDAE	05/16/12	0539	2678171	2.798	3972322	8.392
75		TOXAPH 2500	05/16/12	0557	3105654	2.798	4435496	8.393
76		WNDE	05/16/12	0615	2996182	2.798	4260600	8.393
77	401A/DP	UU16A	05/16/12	0633	4854071	2.794	6894613	8.396
78	401B/DP	UU16B	05/16/12	0650	4893421	2.794	7164272	8.393
79	401C/DP	UU16C	05/16/12	0708	4704670	2.794	6357749	8.393
80	401A/NSM	UU16D	05/16/12	0726	4366690	2.794	6671502	8.395
81	401C/NSM	UU16F	05/16/12	0744	5448515	2.794	7350131	8.395
82	410A/DP	UU16G	05/16/12	0802	5190253	2.795	6917040	8.392
83	410B/DP	UU16H	05/16/12	0819	4565004	2.795	6501896	8.389
84	410C/DP	UU16I	05/16/12	0837	4744056	2.794	7199968	8.394
85	410A/NSM	UU16J	05/16/12	0855	5551311	2.794	8062328	8.394
86	410B/NSM	UU16K	05/16/12	0913	4596963	2.794	6792423	8.390
87	ZZZZZ	ZZZZZ	05/16/12	0931	6225236	2.796	6098784	8.390
88	ZZZZZ	ZZZZZ	05/16/12	0948	3243616	2.797	4152060	8.390
89		DS	05/16/12	1006	3121376	2.797	3925812	8.390
90		INDAE	05/16/12	1024	3016677	2.797	4033257	8.390
91	410B/NSM MS	UU16KMS	05/16/12	1042	4606831	2.794	6899324	8.391

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min

IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP2 ID: 0.53(mm) Instrument ID: ECD6

Init. Calib. Date: 04/09/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
				ICAL MIDPT	13489775	2.879	7611062	9.411
				UPPER LIMIT	26979550	2.929	15222124	9.461
				LOWER LIMIT	6744888	2.829	3805531	9.361
	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01		DS 1878-2	04/09/12	1604	12836781	2.879	7264392	9.411
02	ZZZZZ	ZZZZZ	04/09/12	1622	13904689	2.879	7705210	9.410
03		INDAE 1922-5	04/09/12	1640	13489775	2.879	7611062	9.411
04		INDAA	04/09/12	1658	13588685	2.879	7709640	9.413
05		INDAB	04/09/12	1715	12498845	2.879	7192528	9.413
06		INDAC	04/09/12	1733	12839386	2.880	7330569	9.412
07		INDAD	04/09/12	1751	11658983	2.879	6702587	9.412
08		INDAF	04/09/12	1809	12029213	2.879	6968039	9.411
09		INDAG	04/09/12	1827	11327539	2.879	6662082	9.411
10	ZZZZZ	ZZZZZ	04/09/12	1844	12756271	2.879	7569631	9.408
11	ZZZZZ	ZZZZZ	04/09/12	1902	13789940	2.878	8074028	9.404
12		TOXAPH 1924-	04/09/12	1920	12918332	2.879	7219586	9.412
13		WNDE 1938-1	04/09/12	1938	12661297	2.879	7235238	9.413
14		WNDA	04/09/12	1956	13492559	2.879	7746564	9.411
15		WNDB	04/09/12	2013	13499763	2.879	7908740	9.411
16		WNDC	04/09/12	2031	14149521	2.879	8001827	9.412
17		WNDD	04/09/12	2049	14092686	2.879	8317415	9.411
18		WNDF	04/09/12	2107	13223519	2.879	7561168	9.411
19		WNDG	04/09/12	2125	13605469	2.879	7837962	9.411
20	ZZZZZ	ZZZZZ	04/09/12	2142	13921837	2.879	7903688	9.411
21	ZZZZZ	ZZZZZ	04/09/12	2200	13169398	2.879	7824009	9.411
22	ZZZZZ	ZZZZZ	04/09/12	2218	14257571	2.879	8143706	9.411
23		DS	05/15/12	0706	10889762	2.860	5616685	9.366
24		INDAE	05/15/12	0723	10292474	2.860	5787112	9.366
25		TOXAPH 2500	05/15/12	0741	11011979	2.860	5975373	9.367
26		WNDE	05/15/12	0759	10886849	2.859	6094683	9.365
27	UU16MBS1	UU16MBS1	05/15/12	0817	15948591	2.858	8841517	9.363
28	UU16LCSS1	UU16LCSS1	05/15/12	0835	15233720	2.858	8394392	9.363
29	UU16LCSDS1	UU16LCSDS1	05/15/12	0852	15431113	2.858	8602697	9.363
30	ZZZZZ	ZZZZZ	05/15/12	0910	15400516	2.860	8215875	9.368
31	ZZZZZ	ZZZZZ	05/15/12	0928	15647583	2.860	8621480	9.367
32	ZZZZZ	ZZZZZ	05/15/12	0946	15879628	2.860	8538594	9.366
33	ZZZZZ	ZZZZZ	05/15/12	1004	14517367	2.858	8155274	9.365
34	ZZZZZ	ZZZZZ	05/15/12	1022	14239218	2.858	8167378	9.364
35	ZZZZZ	ZZZZZ	05/15/12	1039	9144355	2.859	5070048	9.366

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min
IS2 = Hexabromobiphenyl

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP2 ID: 0.53(mm) Instrument ID: ECD6

Init. Calib. Date: 04/09/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

		IS1 AREA	RT	IS2 AREA	RT
	ICAL MIDPT	13489775	2.879	7611062	9.411
	UPPER LIMIT	26979550	2.929	15222124	9.461
	LOWER LIMIT	6744888	2.829	3805531	9.361

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
36	ZZZZZ	ZZZZZ	05/15/12	1057	9541722	2.860	5360545	9.367
37		DS	05/15/12	1115	9163054	2.860	4967623	9.367
38		INDAE	05/15/12	1133	8258514	2.860	4636159	9.365
39		TOXAPH 2500	05/15/12	1151	10253612	2.860	5600991	9.365
40		WNDE	05/15/12	1209	9470705	2.860	5115452	9.366
41	ZZZZZ	ZZZZZ	05/15/12	1226	15191454	2.860	8670927	9.367
42	ZZZZZ	ZZZZZ	05/15/12	1244	13054071	2.858	8248045	9.363
43	ZZZZZ	ZZZZZ	05/15/12	1302	14491951	2.857		
44	ZZZZZ	ZZZZZ	05/15/12	1320	11956120	2.856	39573*	9.428
45	ZZZZZ	ZZZZZ	05/15/12	1338	12305396	2.856	8343175	9.363
46	ZZZZZ	ZZZZZ	05/15/12	1355	15384286	2.857	9297258	9.363
47	401A/DP	UU16A	05/15/12	1413	13404345	2.858	7226903	9.362
48	401B/DP	UU16B	05/15/12	1431	13593652	2.858	7461001	9.362
49	401C/DP	UU16C	05/15/12	1449	14216723	2.858	7608987	9.363
50	401A/NSM	UU16D	05/15/12	1507	13657042	2.858	7065453	9.362
51	ZZZZZ	ZZZZZ	05/15/12	1524	14780629	2.857	7518939	9.364
52	ZZZZZ	ZZZZZ	05/15/12	1542	9514127	2.859	5323305	9.365
53	ZZZZZ	ZZZZZ	05/15/12	1600	9335272	2.860	5144350	9.365
54		DS	05/15/12	1618	9619855	2.860	5089015	9.366
55		INDAE	05/15/12	1636	8930655	2.859	4802188	9.366
56		TOXAPH 2500	05/15/12	1653	10467810	2.859	5691236	9.367
57		WNDE	05/15/12	1711	9573829	2.859	5478025	9.366
58	401B/NSM	UU16E	05/15/12	1729	15690635	2.858	8811381	9.364
59	401C/NSM	UU16F	05/15/12	1747	13983322	2.858	7611564	9.363
60	410A/DP	UU16G	05/15/12	1805	14466312	2.858	8011472	9.362
61	410B/DP	UU16H	05/15/12	1822	14620446	2.858	7912679	9.362
62	410C/DP	UU16I	05/15/12	1840	14232973	2.858	7591209	9.363
63	410A/NSM	UU16J	05/15/12	1858	14069438	2.857	7500712	9.362
64	410B/NSM	UU16K	05/15/12	1916	14559218	2.858	7630023	9.361
65	410B/NSM MS	UU16KMS	05/15/12	1934	14242553	2.858	7541144	9.362
66	410B/NSM MSD	UU16KMSD	05/15/12	1952	14301938	2.858	7566756	9.361
67	410C/NSM	UU16L	05/15/12	2009	13768846	2.858	7356992	9.363
68	ZZZZZ	ZZZZZ	05/15/12	2027	14667306	2.857	8043782	9.365
69	ZZZZZ	ZZZZZ	05/15/12	2045	9533507	2.859	5217002	9.365
70	ZZZZZ	ZZZZZ	05/15/12	2103	9949741	2.860	5622618	9.365

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min
IS2 = Hexabromobiphenyl

FORM 8
PESTICIDE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P. T4 MAINTENANCE

GC Column: STX-CLP2 ID: 0.53(mm) Instrument ID: ECD6

Init. Calib. Date: 04/09/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
				ICAL MIDPT	13489775	2.879	7611062	9.411
				UPPER LIMIT	26979550	2.929	15222124	9.461
				LOWER LIMIT	6744888	2.829	3805531	9.361
	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
71		DS	05/15/12	2121	9792308	2.859	5265201	9.366
72		INDAE	05/15/12	2138	9052430	2.860	5041751	9.366
73		DS	05/16/12	0521	11111023	2.859	5603202	9.365
74		INDAE	05/16/12	0539	9567049	2.859	5488413	9.365
75		TOXAPH 2500	05/16/12	0557	10889874	2.859	6008204	9.365
76		WNDE	05/16/12	0615	10543859	2.858	6114002	9.365
77	401A/DP	UU16A	05/16/12	0633	12875682	2.855	5264415	9.366
78	401B/DP	UU16B	05/16/12	0650	13032888	2.855	5522993	9.364
79	401C/DP	UU16C	05/16/12	0708	12484561	2.855	5211462	9.365
80	401A/NSM	UU16D	05/16/12	0726	11983227	2.854	4714681	9.366
81	401C/NSM	UU16F	05/16/12	0744	13808327	2.855	5439832	9.365
82	410A/DP	UU16G	05/16/12	0802	13085021	2.855	5563209	9.365
83	410B/DP	UU16H	05/16/12	0819	12659337	2.855	5559256	9.363
84	410C/DP	UU16I	05/16/12	0837	12139963	2.855	5040030	9.365
85	410A/NSM	UU16J	05/16/12	0855	13334813	2.855	5658035	9.365
86	410B/NSM	UU16K	05/16/12	0913	12315212	2.855	5105113	9.363
87	ZZZZZ	ZZZZZ	05/16/12	0931	14039783	2.856	5809474	9.364
88	ZZZZZ	ZZZZZ	05/16/12	0948	10304486	2.857	4701857	9.363
89		DS	05/16/12	1006	10041581	2.857	4456828	9.362
90		INDAE	05/16/12	1024	9909454	2.857	4731776	9.363
91	410B/NSM MS	UU16KMS	05/16/12	1042	12529765	2.855	5503928	9.363

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- .05 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

PCB Analysis
Report and Summary QC Forms

ARI Job ID: UU16

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: 401A/DP
SAMPLE

Lab Sample ID: UU16A
LIMS ID: 12-8723
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 15:24
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 45.1%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	1.0	3.9	< 3.9 U
53469-21-9	Aroclor 1242	1.3	3.9	< 3.9 U
12672-29-6	**Aroclor 1248**	**1.3**	**3.9**	**12 P**
11097-69-1	Aroclor 1254	1.3	12	< 12 Y
11096-82-5	**Aroclor 1260**	**1.3**	**3.9**	**10**
11104-28-2	Aroclor 1221	1.3	3.9	< 3.9 U
11141-16-5	Aroclor 1232	1.3	3.9	< 3.9 U
37324-23-5	Aroclor 1262	1.3	3.9	< 3.9 U
11100-14-4	Aroclor 1268	1.3	3.9	< 3.9 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	83.5%
Tetrachlorometaxylene	86.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: 401B/DP
SAMPLE

Lab Sample ID: UU16B
LIMS ID: 12-8724
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 15:45
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 13.1 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 35.0%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	0.97	3.8	< 3.8 U
53469-21-9	Aroclor 1242	1.3	3.8	< 3.8 U
12672-29-6	Aroclor 1248	1.3	19	< 19 Y
11097-69-1	Aroclor 1254	1.3	19	< 19 Y
11096-82-5	**Aroclor 1260**	**1.3**	**3.8**	**16**
11104-28-2	Aroclor 1221	1.3	3.8	< 3.8 U
11141-16-5	Aroclor 1232	1.3	3.8	< 3.8 U
37324-23-5	Aroclor 1262	1.3	3.8	< 3.8 U
11100-14-4	Aroclor 1268	1.3	3.8	< 3.8 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	89.0%
Tetrachlorometaxylene	87.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: 401C/DP
SAMPLE

Lab Sample ID: UU16C
LIMS ID: 12-8725
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 16:06
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 12.9 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 52.4%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	0.99	3.9	< 3.9 U
53469-21-9	Aroclor 1242	1.3	3.9	< 3.9 U
12672-29-6	Aroclor 1248	1.3	5.8	< 5.8 Y
11097-69-1	Aroclor 1254	1.3	5.8	< 5.8 Y
11096-82-5	**Aroclor 1260**	**1.3**	**3.9**	**5.5**
11104-28-2	Aroclor 1221	1.3	3.9	< 3.9 U
11141-16-5	Aroclor 1232	1.3	3.9	< 3.9 U
37324-23-5	Aroclor 1262	1.3	3.9	< 3.9 U
11100-14-4	Aroclor 1268	1.3	3.9	< 3.9 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	83.2%
Tetrachlorometaxylene	93.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: 401A/NSM
SAMPLE

Lab Sample ID: UU16D
LIMS ID: 12-8726
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 16:27
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 12.9 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 24.8%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	0.99	3.9	< 3.9 U
53469-21-9	Aroclor 1242	1.3	3.9	< 3.9 U
12672-29-6	**Aroclor 1248**	**1.3**	**3.9**	**7.9**
11097-69-1	Aroclor 1254	1.3	9.7	< 9.7 Y
11096-82-5	**Aroclor 1260**	**1.3**	**3.9**	**9.1**
11104-28-2	Aroclor 1221	1.3	3.9	< 3.9 U
11141-16-5	Aroclor 1232	1.3	3.9	< 3.9 U
37324-23-5	Aroclor 1262	1.3	3.9	< 3.9 U
11100-14-4	Aroclor 1268	1.3	3.9	< 3.9 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	99.0%
Tetrachlorometaxylene	91.8%

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD

Sample ID: 401B/NSM
SAMPLE

Lab Sample ID: UU16E
LIMS ID: 12-8727
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 16:48
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 13.1 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 19.6%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	0.97	3.8	< 3.8 U
53469-21-9	Aroclor 1242	1.3	3.8	< 3.8 U
12672-29-6	Aroclor 1248	1.3	3.8	< 3.8 U
11097-69-1	Aroclor 1254	1.3	3.8	< 3.8 U
11096-82-5	Aroclor 1260	1.3	3.8	< 3.8 U
11104-28-2	Aroclor 1221	1.3	3.8	< 3.8 U
11141-16-5	Aroclor 1232	1.3	3.8	< 3.8 U
37324-23-5	Aroclor 1262	1.3	3.8	< 3.8 U
11100-14-4	Aroclor 1268	1.3	3.8	< 3.8 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	102%
Tetrachlorometaxylene	100%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: 401C/NSM
SAMPLE

Lab Sample ID: UU16F
LIMS ID: 12-8728
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 17:50
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 12.8 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 44.8%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	1.0	3.9	< 3.9 U
53469-21-9	Aroclor 1242	1.3	3.9	< 3.9 U
12672-29-6	Aroclor 1248	1.3	6.8	< 6.8 Y
11097-69-1	Aroclor 1254	1.3	9.8	< 9.8 Y
11096-82-5	**Aroclor 1260**	**1.3**	**3.9**	**6.6**
11104-28-2	Aroclor 1221	1.3	3.9	< 3.9 U
11141-16-5	Aroclor 1232	1.3	3.9	< 3.9 U
37324-23-5	Aroclor 1262	1.3	3.9	< 3.9 U
11100-14-4	Aroclor 1268	1.3	3.9	< 3.9 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	88.2%
Tetrachlorometaxylene	90.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: 410A/DP
SAMPLE

Lab Sample ID: UU16G
LIMS ID: 12-8729
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 18:11
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 12.9 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 44.1%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	0.99	3.9	< 3.9 U
53469-21-9	Aroclor 1242	1.3	9.7	< 9.7 Y
12672-29-6	Aroclor 1248	1.3	3.9	< 3.9 U
11097-69-1	Aroclor 1254	1.3	5.8	< 5.8 Y
11096-82-5	**Aroclor 1260**	**1.3**	**3.9**	**5.7**
11104-28-2	Aroclor 1221	1.3	3.9	< 3.9 U
11141-16-5	Aroclor 1232	1.3	3.9	< 3.9 U
37324-23-5	Aroclor 1262	1.3	3.9	< 3.9 U
11100-14-4	Aroclor 1268	1.3	3.9	< 3.9 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	91.0%
Tetrachlorometaxylene	94.0%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: 410B/DP
SAMPLE

Lab Sample ID: UU16H
LIMS ID: 12-8730
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 18:32
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 13.3 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 27.4%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	0.96	3.8	< 3.8 U
53469-21-9	Aroclor 1242	1.3	5.6	< 5.6 Y
12672-29-6	Aroclor 1248	1.3	3.8	< 3.8 U
11097-69-1	Aroclor 1254	1.3	3.8	< 3.8 U
11096-82-5	**Aroclor 1260**	**1.3**	**3.8**	**3.8**
11104-28-2	Aroclor 1221	1.3	3.8	< 3.8 U
11141-16-5	Aroclor 1232	1.3	3.8	< 3.8 U
37324-23-5	Aroclor 1262	1.3	3.8	< 3.8 U
11100-14-4	Aroclor 1268	1.3	3.8	< 3.8 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	98.8%
Tetrachlorometaxylene	105%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: 410C/DP
SAMPLE

Lab Sample ID: UU16I
LIMS ID: 12-8731
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 18:53
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 12.6 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 33.9%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	1.0	4.0	< 4.0 U
53469-21-9	Aroclor 1242	1.3	4.0	< 4.0 U
12672-29-6	Aroclor 1248	1.3	20	< 20 Y
11097-69-1	Aroclor 1254	1.3	20	< 20 Y
11096-82-5	**Aroclor 1260**	**1.3**	**4.0**	**16**
11104-28-2	Aroclor 1221	1.3	4.0	< 4.0 U
11141-16-5	Aroclor 1232	1.3	4.0	< 4.0 U
37324-23-5	Aroclor 1262	1.3	4.0	< 4.0 U
11100-14-4	Aroclor 1268	1.3	4.0	< 4.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	95.8%
Tetrachlorometaxylene	93.5%

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: 410A/NSM
SAMPLE

Lab Sample ID: UU16J
LIMS ID: 12-8732
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 19:56
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 12.6 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 40.4%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	1.0	4.0	< 4.0 U
53469-21-9	Aroclor 1242	1.3	4.0	< 4.0 U
12672-29-6	Aroclor 1248	1.3	9.9	< 9.9 Y
11097-69-1	Aroclor 1254	1.3	9.9	< 9.9 Y
11096-82-5	**Aroclor 1260**	**1.3**	**4.0**	**9.3**
11104-28-2	Aroclor 1221	1.3	4.0	< 4.0 U
11141-16-5	Aroclor 1232	1.3	4.0	< 4.0 U
37324-23-5	Aroclor 1262	1.3	4.0	< 4.0 U
11100-14-4	Aroclor 1268	1.3	4.0	< 4.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	82.0%
Tetrachlorometaxylene	85.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: 410B/NSM
SAMPLE

Lab Sample ID: UU16K
LIMS ID: 12-8733
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 20:17
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 12.8 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 25.7%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	0.99	3.9	< 3.9 U
53469-21-9	Aroclor 1242	1.3	3.9	< 3.9 U
12672-29-6	Aroclor 1248	1.3	5.8	< 5.8 Y
11097-69-1	Aroclor 1254	1.3	5.8	< 5.8 Y
11096-82-5	**Aroclor 1260**	**1.3**	**3.9**	**4.9**
11104-28-2	Aroclor 1221	1.3	3.9	< 3.9 U
11141-16-5	Aroclor 1232	1.3	3.9	< 3.9 U
37324-23-5	Aroclor 1262	1.3	3.9	< 3.9 U
11100-14-4	Aroclor 1268	1.3	3.9	< 3.9 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	99.5%
Tetrachlorometaxylene	98.8%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: 410C/NSM
SAMPLE

Lab Sample ID: UU16L
LIMS ID: 12-8734
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 14:00
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 13.0 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 10.0
Silica Gel: No

Percent Moisture: 31.7%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	9.8	38	< 38 U
53469-21-9	Aroclor 1242	13	38	< 38 U
12672-29-6	**Aroclor 1248**	**13**	**38**	**160 P**
11097-69-1	**Aroclor 1254**	**13**	**38**	**180**
11096-82-5	**Aroclor 1260**	**13**	**38**	**95**
11104-28-2	Aroclor 1221	13	38	< 38 U
11141-16-5	Aroclor 1232	13	38	< 38 U
37324-23-5	Aroclor 1262	13	38	< 38 U
11100-14-4	Aroclor 1268	13	38	< 38 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	132%
Tetrachlorometaxylene	116%

FORM I

ANALYTICAL RESOURCES INCORPORATED

SW8082/PCB SOIL/SEDIMENT SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00

Client ID	DCBP % REC	DCBP LCL-UCL	TCMX % REC	TCMX LCL-UCL	TOT OUT
401A/DP	83.5%	24-127	86.0%	34-109	0
401B/DP	89.0%	24-127	87.0%	34-109	0
401C/DP	83.2%	24-127	93.2%	34-109	0
401A/NSM	99.0%	24-127	91.8%	34-109	0
401B/NSM	102%	24-127	100%	34-109	0
401C/NSM	88.2%	24-127	90.5%	34-109	0
410A/DP	91.0%	24-127	94.0%	34-109	0
410B/DP	98.8%	24-127	105%	34-109	0
MB-051212	98.2%	48-123	97.8%	43-107	0
LCS-051212	103%	48-123	100%	43-107	0
LCSD-051212	102%	48-123	96.8%	43-107	0
410C/DP	95.8%	24-127	93.5%	34-109	0
410C/DP MS	99.8%	24-127	95.5%	34-109	0
410C/DP MSD	108%	24-127	95.5%	34-109	0
410A/NSM	82.0%	24-127	85.5%	34-109	0
410B/NSM	99.5%	24-127	98.8%	34-109	0
410C/NSM	132%*	24-127	116%*	34-109	2

Microwave (MARS) Control Limits PCBSMM
Prep Method: SW3546
Log Number Range: 12-8723 to 12-8734

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: 410C/DP
MS/MSD

Lab Sample ID: UU16I
LIMS ID: 12-8731
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted MS/MSD: 05/12/12

Date Analyzed MS: 05/14/12 19:14
MSD: 05/14/12 19:35
Instrument/Analyst MS: ECD7/JGR
MSD: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount MS: 12.7 g-dry-wt
MSD: 12.7 g-dry-wt
Final Extract Volume MS: 2.5 mL
MSD: 2.5 mL
Dilution Factor MS: 1.00
MSD: 1.00
Silica Gel: No

Percent Moisture: 33.9%

Analyte	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Aroclor 1016	< 4.0 U	83.1	99.4	83.6%	82.5	99.2	83.2%	0.7%
Aroclor 1260	15.9	84.9	99.4	69.4%	94.8	99.2	79.5%	11.0%

Results reported in µg/kg (ppb)
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: 410C/DP
MATRIX SPIKE

Lab Sample ID: UU16I
LIMS ID: 12-8731
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 19:14
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 33.9%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	1.0	4.0	---
53469-21-9	Aroclor 1242	1.3	4.0	< 4.0 U
12672-29-6	Aroclor 1248	1.3	69	< 69 Y
11097-69-1	Aroclor 1254	1.3	49	< 49 Y
11096-82-5	Aroclor 1260	1.3	4.0	---
11104-28-2	Aroclor 1221	1.3	4.0	< 4.0 U
11141-16-5	Aroclor 1232	1.3	4.0	< 4.0 U
37324-23-5	Aroclor 1262	1.3	4.0	< 4.0 U
11100-14-4	Aroclor 1268	1.3	4.0	< 4.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	99.8%
Tetrachlorometaxylene	95.5%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: 410C/DP
MATRIX SPIKE DUP

Lab Sample ID: UU16I
LIMS ID: 12-8731
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 19:35
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 12.7 g-dry-wt
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: 33.9%

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	1.0	3.9	---
53469-21-9	Aroclor 1242	1.3	3.9	< 3.9 U
12672-29-6	Aroclor 1248	1.3	69	< 69 Y
11097-69-1	Aroclor 1254	1.3	49	< 49 Y
11096-82-5	Aroclor 1260	1.3	3.9	---
11104-28-2	Aroclor 1221	1.3	3.9	< 3.9 U
11141-16-5	Aroclor 1232	1.3	3.9	< 3.9 U
37324-23-5	Aroclor 1262	1.3	3.9	< 3.9 U
11100-14-4	Aroclor 1268	1.3	3.9	< 3.9 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	108%
Tetrachlorometaxylene	95.5%

FORM I

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: LCS-051212
LCS/LCSD

Lab Sample ID: LCS-051212
LIMS ID: 12-8731
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: NA
Date Received: NA

Date Extracted LCS/LCSD: 05/12/12

Date Analyzed LCS: 05/14/12 14:42
LCSD: 05/14/12 15:03
Instrument/Analyst LCS: ECD7/JGR
LCSD: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes
Florisil Cleanup: No

Sample Amount LCS: 12.5 g-dry-wt
LCSD: 12.5 g-dry-wt
Final Extract Volume LCS: 2.50 mL
LCSD: 2.50 mL
Dilution Factor LCS: 1.00
LCSD: 1.00
Silica Gel: No

Percent Moisture: NA

Analyte	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Aroclor 1016	87.3	101	86.4%	83.5	101	82.7%	4.4%
Aroclor 1260	82.9	101	82.1%	78.6	101	77.8%	5.3%

PCB Surrogate Recovery

	LCS	LCSD
Decachlorobiphenyl	103%	102%
Tetrachlorometaxylene	100%	96.8%

Results reported in µg/kg (ppb)
RPD calculated using sample concentrations per SW846.

PCB METHOD BLANK SUMMARY

BLANK NO.

UU16MBS1

Lab Name: ANALYTICAL RESOURCES INC
Client: HART CROWSER

ARI Job No.: UU16
Project: P.O.P. T4 MAINTENANC

Lab Sample ID: UU16MBS1
Lab File ID: 0514A016

Date Extracted: 05/12/12
Matrix: SOLID

Date Analyzed: 05/14/12
Instrument ID: ECD7

Time Analyzed: 1421
GC Columns: ZB5/ZB35

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	410C/NSM	UU16L	05/14/12
02	UU16LCSS1	UU16LCSS1	05/14/12
03	UU16LCSDS1	UU16LCSDS1	05/14/12
04	401A/DP	UU16A	05/14/12
05	401B/DP	UU16B	05/14/12
06	401C/DP	UU16C	05/14/12
07	401A/NSM	UU16D	05/14/12
08	401B/NSM	UU16E	05/14/12
09	401C/NSM	UU16F	05/14/12
10	410A/DP	UU16G	05/14/12
11	410B/DP	UU16H	05/14/12
12	410C/DP	UU16I	05/14/12
13	410C/DP MS	UU16IMS	05/14/12
14	410C/DP MSD	UU16IMSD	05/14/12
15	410A/NSM	UU16J	05/14/12
16	410B/NSM	UU16K	05/14/12

ALL RUNS ARE DUAL COLUMN

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PSDDA PCB by GC/ECD
Page 1 of 1

Sample ID: MB-051212
METHOD BLANK

Lab Sample ID: MB-051212
LIMS ID: 12-8731
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance 15753-00
Date Sampled: NA
Date Received: NA

Date Extracted: 05/12/12
Date Analyzed: 05/14/12 14:21
Instrument/Analyst: ECD7/JGR
GPC Cleanup: No
Sulfur Cleanup: Yes
Acid Cleanup: Yes

Sample Amount: 12.5 g
Final Extract Volume: 2.5 mL
Dilution Factor: 1.00
Silica Gel: No

Percent Moisture: NA

CAS Number	Analyte	MDL	RL	Result
12674-11-2	Aroclor 1016	1.0	4.0	< 4.0 U
53469-21-9	Aroclor 1242	1.4	4.0	< 4.0 U
12672-29-6	Aroclor 1248	1.4	4.0	< 4.0 U
11097-69-1	Aroclor 1254	1.4	4.0	< 4.0 U
11096-82-5	Aroclor 1260	1.4	4.0	< 4.0 U
11104-28-2	Aroclor 1221	1.4	4.0	< 4.0 U
11141-16-5	Aroclor 1232	1.4	4.0	< 4.0 U
37324-23-5	Aroclor 1262	1.4	4.0	< 4.0 U
11100-14-4	Aroclor 1268	1.4	4.0	< 4.0 U

Reported in µg/kg (ppb)

PCB Surrogate Recovery

Decachlorobiphenyl	98.2%
Tetrachlorometaxylene	97.8%

FORM I

6F

8082 INITIAL CALIBRATION OF AROCLOR 1016/1260

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB5 Instrument ID: ECD7

Calibration Date: 05/05/12

SURROGATES

	RT WIN	LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
TCX	6.18- 6.38	0.8551	0.8827	0.9844	0.9780	0.9930	0.9785	0.9453	6.4
DCB	14.76-14.96	0.9768	0.9833	1.0322	0.9634	0.9476	0.9324	0.9726	3.6

Aroclor-1016 Peak	RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1	8.19- 8.39	0.0245	0.0234	0.0248	0.0231	0.0227	0.0217	0.0234	4.9
2	8.67- 8.87	0.0826	0.0799	0.0852	0.0798	0.0787	0.0752	0.0802	4.2
3	8.85- 9.05	0.0329	0.0317	0.0334	0.0309	0.0302	0.0288	0.0313	5.5
4	8.98- 9.18	0.0227	0.0227	0.0228	0.0213	0.0208	0.0201	0.0217	5.3

AROCLOR AVERAGE %RSD = 5.0

Aroclor-1260 Peak	RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1	11.73-11.93	0.0766	0.0714	0.0740	0.0684	0.0661	0.0637	0.0700	7.0
2	12.33-12.53	0.0498	0.0467	0.0486	0.0441	0.0432	0.0412	0.0456	7.2
3	12.65-12.85	0.0486	0.0461	0.0483	0.0441	0.0436	0.0418	0.0454	5.9
4	13.38-13.58	0.0601	0.0573	0.0602	0.0557	0.0548	0.0533	0.0569	5.0
5	13.48-13.68	0.0245	0.0237	0.0246	0.0222	0.0213	0.0203	0.0228	7.7

AROCLOR AVERAGE %RSD = 6.6

6F

8082 INITIAL CALIBRATION OF AROCLOR 1016/1260

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB35 Instrument ID: ECD7

Calibration Date: 05/05/12

SURROGATES

	RT WIN	LVL1	LVL2	LVL3	LVL4	LVL5	LVL6	MEAN	%RSD
TCX	6.31- 6.51	1.0436	0.9760	1.0443	0.9813	0.9808	0.9733	0.9999	3.4
DCB	15.09-15.29	1.0035	0.9248	0.9607	0.8830	0.8740	0.8578	0.9173	6.2

Aroclor-1016 Peak	RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1	8.44- 8.64	0.0488	0.0436	0.0436	0.0376	0.0358	0.0335	0.0405	14.3
2	9.17- 9.37	0.0967	0.0850	0.0871	0.0766	0.0750	0.0724	0.0821	11.2
3	9.59- 9.79	0.0251	0.0227	0.0230	0.0198	0.0190	0.0180	0.0213	12.9
4	9.70- 9.90	0.0308	0.0272	0.0269	0.0225	0.0211	0.0197	0.0247	17.2

AROCLOR AVERAGE %RSD = 13.9

Aroclor-1260 Peak	RT WIN	LVL1 .02	LVL2 0.05	LVL3 0.1	LVL4 .25	LVL5 0.5	LVL6 1.0	MEAN	%RSD R^2
1	12.63-12.83	0.0878	0.0764	0.0754	0.0664	0.0635	0.0610	0.0718	14.0
2	13.40-13.60	0.1277	0.1131	0.1149	0.1043	0.1021	0.1009	0.1105	9.3
3	13.90-14.10	0.0871	0.0768	0.0772	0.0686	0.0662	0.0643	0.0734	11.7
4	14.46-14.66	0.0317	0.0277	0.0283	0.0261	0.0244	0.0229	0.0269	11.6

AROCLOR AVERAGE %RSD = 11.6

6G

8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB5 Instrument ID: ECD7

Calibration Date: 05/05/12

Aroclor-1221			
Peak	RT	RT WIN	Cal Factor
1	6.743	6.64- 6.84	0.00925
2	6.954	6.85- 7.05	0.00692
3	7.077	6.98- 7.18	0.02309

Aroclor-1232			
Peak	RT	RT WIN	Cal Factor
1	8.298	8.20- 8.40	0.00924
2	8.784	8.68- 8.88	0.03144
3	8.959	8.86- 9.06	0.01240
4	10.328	10.23-10.43	0.01402

Aroclor-1242			
Peak	RT	RT WIN	Cal Factor
1	8.291	8.19- 8.39	0.01773
2	8.778	8.68- 8.88	0.06072
3	8.951	8.85- 9.05	0.02366
4	10.567	10.47-10.67	0.02161

Aroclor-1248			
Peak	RT	RT WIN	Cal Factor
1	9.351	9.25- 9.45	0.02432
2	9.681	9.58- 9.78	0.02973
3	10.324	10.22-10.42	0.04424
4	10.569	10.47-10.67	0.03425

6G

8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB5 Instrument ID: ECD7

Calibration Date: 05/05/12

Aroclor-1254			
Peak	RT	RT WIN	Cal Factor
1	10.327	10.23-10.43	0.03773
2	10.648	10.55-10.75	0.05204
3	11.032	10.93-11.13	0.03280
4	11.170	11.07-11.27	0.06214
5	11.887	11.79-11.99	0.04145

Aroclor-1262			
Peak	RT	RT WIN	Cal Factor
1	12.443	12.34-12.54	0.07165
2	12.758	12.66-12.86	0.05175
3	13.121	13.02-13.22	0.13578
4	13.591	13.49-13.69	0.04564
5	13.655	13.55-13.75	0.04827

Aroclor-1268			
Peak	RT	RT WIN	Cal Factor
1	13.590	13.49-13.69	0.14082
2	13.652	13.55-13.75	0.12785
3	13.975	13.87-14.07	0.10801
4	14.577	14.48-14.68	0.33215

6G
8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB35 Instrument ID: ECD7

Calibration Date: 05/05/12

Aroclor-1221			
Peak	RT	RT WIN	Cal Factor
1	7.241	7.14- 7.34	0.01150
2	7.542	7.44- 7.64	0.00709
3	7.680	7.58- 7.78	0.02115
4	7.767	7.67- 7.87	0.00403

Aroclor-1232			
Peak	RT	RT WIN	Cal Factor
1	8.548	8.45- 8.65	0.01741
2	9.278	9.18- 9.38	0.03242
3	9.704	9.60- 9.80	0.00873
4	10.257	10.16-10.36	0.01310

Aroclor-1242			
Peak	RT	RT WIN	Cal Factor
1	8.538	8.44- 8.64	0.02970
2	9.267	9.17- 9.37	0.06071
3	9.695	9.59- 9.79	0.01605
4	11.157	11.06-11.26	0.02494

Aroclor-1248			
Peak	RT	RT WIN	Cal Factor
1	9.805	9.71- 9.91	0.02817
2	10.249	10.15-10.35	0.03101
3	10.799	10.70-10.90	0.03150
4	11.158	11.06-11.26	0.04057

6G

8082 INITIAL CALIBRATION OF SINGLE POINT PCBs

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB35 Instrument ID: ECD7

Calibration Date: 05/05/12

Aroclor-1254			
Peak	RT	RT WIN	Cal Factor
1	10.862	10.76-10.96	0.02995
2	11.032	10.93-11.13	0.03823
3	11.568	11.47-11.67	0.03044
4	11.720	11.62-11.82	0.06468
5	12.504	12.40-12.60	0.03899

Aroclor-1262			
Peak	RT	RT WIN	Cal Factor
1	12.831	12.73-12.93	0.06891
2	13.274	13.17-13.37	0.05805
3	13.513	13.41-13.61	0.13025
4	13.957	13.86-14.06	0.04951
5	14.008	13.91-14.11	0.07946

Aroclor-1268			
Peak	RT	RT WIN	Cal Factor
1	13.955	13.85-14.05	0.13235
2	14.010	13.91-14.11	0.12424
3	14.322	14.22-14.42	0.09837
4	14.912	14.81-15.01	0.30876

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB5 Intrument: ECD7

Init. Calib. Date: 05/05/12

Date Analyzed :05/14/12

Lab Standard ID: AR1242 Time Analyzed :1209

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1242-1	8.29	8.19	8.39	257.0	250.0	2.8
Aroclor-1242-2	8.78	8.68	8.88	255.2	250.0	2.1
Aroclor-1242-3	8.95	8.85	9.05	257.1	250.0	2.8
Aroclor-1242-4	10.57	10.47	10.67	263.6	250.0	5.4

AVERAGE %D = 3.3

FORM VII PCB

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB35 Intrument: ECD7

Init. Calib. Date: 05/05/12

Date Analyzed :05/14/12

Lab Standard ID: AR1242 Time Analyzed :1209

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1242-1	8.54	8.44	8.64	256.9	250.0	2.8
Aroclor-1242-2	9.27	9.17	9.37	257.9	250.0	3.2
Aroclor-1242-3	9.69	9.59	9.79	260.4	250.0	4.1
Aroclor-1242-4	11.16	11.06	11.26	262.1	250.0	4.8

AVERAGE %D = 3.7

FORM VII PCB

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB5 Intrument: ECD7

Init. Calib. Date: 05/05/12

Date Analyzed :05/14/12

Lab Standard ID: AR1660 Time Analyzed :1230

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	8.29	8.19	8.39	254.9	250.0	2.0
Aroclor-1016-2	8.78	8.67	8.87	254.5	250.0	1.8
Aroclor-1016-3	8.95	8.85	9.05	254.0	250.0	1.6
Aroclor-1016-4	9.08	8.98	9.18	250.8	250.0	0.3

AVERAGE %D = 1.4

Date Analyzed :05/14/12

Lab Standard ID: AR1660 Time Analyzed :1230

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	11.83	11.73	11.93	243.8	250.0	-2.5
Aroclor-1260-2	12.43	12.33	12.53	247.1	250.0	-1.2
Aroclor-1260-3	12.75	12.65	12.85	250.2	250.0	0.1
Aroclor-1260-4	13.48	13.38	13.58	253.7	250.0	1.5
Aroclor-1260-5	13.58	13.48	13.68	252.9	250.0	1.1

AVERAGE %D = 1.3

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB35 Intrument: ECD7

Init. Calib. Date: 05/05/12

Date Analyzed :05/14/12

Lab Standard ID: AR1660 Time Analyzed :1230

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	8.54	8.44	8.64	247.5	250.0	-1.0
Aroclor-1016-2	9.27	9.17	9.37	252.3	250.0	0.9
Aroclor-1016-3	9.69	9.59	9.79	258.1	250.0	3.2
Aroclor-1016-4	9.80	9.70	9.90	254.0	250.0	1.6

AVERAGE %D = 1.7

Date Analyzed :05/14/12

Lab Standard ID: AR1660 Time Analyzed :1230

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	12.73	12.63	12.83	234.7	250.0	-6.1
Aroclor-1260-2	13.50	13.40	13.60	238.2	250.0	-4.7
Aroclor-1260-3	14.00	13.90	14.10	246.8	250.0	-1.3
Aroclor-1260-4	14.56	14.46	14.66	254.2	250.0	1.7

AVERAGE %D = 3.5

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB5 Intrument: ECD7

Init. Calib. Date: 05/05/12

Date Analyzed :05/14/12

Lab Standard ID: AR1248 Time Analyzed :1708

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1248-1	9.35	9.25	9.45	255.7	250.0	2.3
Aroclor-1248-2	9.68	9.58	9.78	255.6	250.0	2.2
Aroclor-1248-3	10.32	10.22	10.42	256.4	250.0	2.6
Aroclor-1248-4	10.57	10.47	10.67	258.9	250.0	3.6

AVERAGE %D = 2.7

FORM VII PCB

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB35 Intrument: ECD7

Init. Calib. Date: 05/05/12

Date Analyzed :05/14/12

Lab Standard ID: AR1248 Time Analyzed :1708

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1248-1	9.81	9.71	9.91	259.4	250.0	3.8
Aroclor-1248-2	10.25	10.15	10.35	222.8	250.0	-10.9
Aroclor-1248-3	10.80	10.70	10.90	257.8	250.0	3.1
Aroclor-1248-4	11.16	11.06	11.26	259.1	250.0	3.6

AVERAGE %D = 5.4

FORM VII PCB

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB5 Intrument: ECD7

Init. Calib. Date: 05/05/12

Date Analyzed :05/14/12

Lab Standard ID: AR1660 Time Analyzed :1729

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	8.29	8.19	8.39	259.6	250.0	3.8
Aroclor-1016-2	8.78	8.67	8.87	258.7	250.0	3.5
Aroclor-1016-3	8.95	8.85	9.05	259.0	250.0	3.6
Aroclor-1016-4	9.08	8.98	9.18	257.1	250.0	2.8

AVERAGE %D = 3.4

Date Analyzed :05/14/12

Lab Standard ID: AR1660 Time Analyzed :1729

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	11.83	11.73	11.93	243.9	250.0	-2.4
Aroclor-1260-2	12.43	12.33	12.53	245.3	250.0	-1.9
Aroclor-1260-3	12.75	12.65	12.85	248.0	250.0	-0.8
Aroclor-1260-4	13.48	13.38	13.58	251.7	250.0	0.7
Aroclor-1260-5	13.58	13.48	13.68	247.6	250.0	-1.0

AVERAGE %D = 1.4

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB35 Intrument: ECD7

Init. Calib. Date: 05/05/12

Date Analyzed :05/14/12

Lab Standard ID: AR1660 Time Analyzed :1729

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	8.54	8.44	8.64	244.5	250.0	-2.2
Aroclor-1016-2	9.27	9.17	9.37	249.4	250.0	-0.2
Aroclor-1016-3	9.69	9.59	9.79	254.8	250.0	1.9
Aroclor-1016-4	9.80	9.70	9.90	249.5	250.0	-0.2

AVERAGE %D = 1.1

Date Analyzed :05/14/12

Lab Standard ID: AR1660 Time Analyzed :1729

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	12.73	12.63	12.83	233.9	250.0	-6.4
Aroclor-1260-2	13.50	13.40	13.60	236.6	250.0	-5.4
Aroclor-1260-3	14.00	13.90	14.10	242.3	250.0	-3.1
Aroclor-1260-4	14.56	14.46	14.66	243.2	250.0	-2.7

AVERAGE %D = 4.4

7F

PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB5 Intrument: ECD7

Init. Calib. Date: 05/05/12

Date Analyzed :05/14/12

Lab Standard ID: AR1254 Time Analyzed :2038

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1254-1	10.33	10.23	10.43	246.9	250.0	-1.2
Aroclor-1254-2	10.65	10.55	10.75	246.9	250.0	-1.2
Aroclor-1254-3	11.03	10.93	11.13	246.9	250.0	-1.2
Aroclor-1254-4	11.17	11.07	11.27	246.8	250.0	-1.3
Aroclor-1254-5	11.89	11.79	11.99	244.7	250.0	-2.1

AVERAGE %D = 1.4

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB35 Intrument: ECD7

Init. Calib. Date: 05/05/12

Date Analyzed :05/14/12

Lab Standard ID: AR1254 Time Analyzed :2038

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1254-1	10.86	10.76	10.96	246.4	250.0	-1.4
Aroclor-1254-2	11.03	10.93	11.13	248.9	250.0	-0.4
Aroclor-1254-3	11.57	11.47	11.67	240.2	250.0	-3.9
Aroclor-1254-4	11.72	11.62	11.82	248.4	250.0	-0.6
Aroclor-1254-5	12.50	12.40	12.60	243.8	250.0	-2.5

AVERAGE %D = 1.8

FORM VII PCB

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB5 Intrument: ECD7

Init. Calib. Date: 05/05/12

Date Analyzed :05/14/12

Lab Standard ID: AR1660 Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	8.29	8.19	8.39	255.1	250.0	2.0
Aroclor-1016-2	8.77	8.67	8.87	255.0	250.0	2.0
Aroclor-1016-3	8.95	8.85	9.05	254.1	250.0	1.6
Aroclor-1016-4	9.08	8.98	9.18	252.6	250.0	1.0

AVERAGE %D = 1.6

Date Analyzed :05/14/12

Lab Standard ID: AR1660 Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	11.83	11.73	11.93	246.3	250.0	-1.5
Aroclor-1260-2	12.43	12.33	12.53	246.3	250.0	-1.5
Aroclor-1260-3	12.75	12.65	12.85	248.4	250.0	-0.6
Aroclor-1260-4	13.48	13.38	13.58	252.0	250.0	0.8
Aroclor-1260-5	13.58	13.48	13.68	246.1	250.0	-1.6

AVERAGE %D = 1.2

7F
PCB CALIBRATION VERIFICATION SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB35 Intrument: ECD7

Init. Calib. Date: 05/05/12

Date Analyzed :05/14/12

Lab Standard ID: AR1660 Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1016-1	8.54	8.44	8.64	242.9	250.0	-2.8
Aroclor-1016-2	9.27	9.17	9.37	247.1	250.0	-1.2
Aroclor-1016-3	9.69	9.59	9.79	250.3	250.0	0.1
Aroclor-1016-4	9.80	9.70	9.90	244.5	250.0	-2.2

AVERAGE %D = 1.6

Date Analyzed :05/14/12

Lab Standard ID: AR1660 Time Analyzed :2059

COMPOUND/PEAK NO.	RT	RT WINDOW FROM	RT WINDOW TO	CALC AMOUNT (ng)	NOM AMOUNT (ng)	%D
Aroclor-1260-1	12.73	12.63	12.83	234.4	250.0	-6.2
Aroclor-1260-2	13.50	13.40	13.60	238.2	250.0	-4.7
Aroclor-1260-3	14.00	13.90	14.10	238.9	250.0	-4.4
Aroclor-1260-4	14.56	14.46	14.66	240.3	250.0	-3.9

AVERAGE %D = 4.8

FORM VII PCB

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB5 ID: 0.53(mm) Instrument ID: ECD7

Init. Calib. Date: 05/05/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
				ICAL MIDPT	5841740	3.323	4847662	15.125
				UPPER LIMIT	11683480	3.423	9695324	15.225
				LOWER LIMIT	2920870	3.223	2423831	15.025
	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01	ZZZZZ	ZZZZZ	05/05/12	1422	5670267	3.321	4775962	15.124
02		0.25 PPM AR1	05/05/12	1443	5841740	3.323	4847662	15.125
03		0.02 PPM AR1	05/05/12	1504	5821073	3.323	4777383	15.125
04		0.05 PPM AR1	05/05/12	1525	5746462	3.319	4750609	15.125
05		1 PPM AR1660	05/05/12	1546	5789041	3.325	4842531	15.125
06		0.1 PPM AR16	05/05/12	1607	5827040	3.324	4857527	15.125
07		0.5 PPM AR16	05/05/12	1628	5722910	3.322	4807520	15.124
08		AR1242	05/05/12	1649	5675100	3.321	4740399	15.125
09		AR1248	05/05/12	1709	5828769	3.320	4895491	15.124
10		AR1254	05/05/12	1730	5816856	3.320	4905256	15.124
11		AR2162	05/05/12	1751	5876832	3.320	4941004	15.124
12		AR3268	05/05/12	1812	5840399	3.320	4930920	15.123
13	ZZZZZ	ZZZZZ	05/05/12	1833	5792855	3.317	4886943	15.125
14	ZZZZZ	ZZZZZ	05/05/12	1854	5881762	3.319	4969703	15.124
15	ZZZZZ	ZZZZZ	05/05/12	1915	5801335	3.318	4888022	15.124
16	ZZZZZ	ZZZZZ	05/05/12	1936	5892179	3.322	4967896	15.125
17	ZZZZZ	ZZZZZ	05/05/12	1957	5836839	3.319	4954937	15.125
18	ZZZZZ	ZZZZZ	05/05/12	2018	5864354	3.320	4993833	15.124
19		AR1242	05/14/12	1209	5341280	3.318	4660861	15.118
20		AR1660	05/14/12	1230	4371788	3.316	3928537	15.119
21	ZZZZZ	ZZZZZ	05/14/12	1251	15878325*	3.316	14895615*	15.119
22	ZZZZZ	ZZZZZ	05/14/12	1312	15996592*	3.314	15006907*	15.118
23	410C/NSM	UU16L	05/14/12	1400	5100486	3.282	4679008	15.116
24	UU16MBS1	UU16MBS1	05/14/12	1421	5691490	3.301	5430027	15.117
25	UU16LCSS1	UU16LCSS1	05/14/12	1442	5763494	3.309	5500717	15.119
26	UU16LCSDS1	UU16LCSDS1	05/14/12	1503	5773985	3.314	5556818	15.120
27	401A/DP	UU16A	05/14/12	1524	5421234	3.312	4860842	15.119
28	401B/DP	UU16B	05/14/12	1545	5570710	3.315	4931091	15.118
29	401C/DP	UU16C	05/14/12	1606	5484224	3.312	4747451	15.119
30	401A/NSM	UU16D	05/14/12	1627	5461428	3.317	4733769	15.119
31	401B/NSM	UU16E	05/14/12	1648	5586686	3.316	5056856	15.120
32		AR1248	05/14/12	1708	5311700	3.315	4681312	15.120

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB5 ID: 0.53(mm) Instrument ID: ECD7

Init. Calib. Date: 05/05/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
				ICAL MIDPT	5841740	3.323	4847662	15.125
				UPPER LIMIT	11683480	3.423	9695324	15.225
				LOWER LIMIT	2920870	3.223	2423831	15.025
	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
33		AR1660	05/14/12	1729	4456309	3.314	3980283	15.118
34	401C/NSM	UU16F	05/14/12	1750	5574103	3.315	4823691	15.118
35	410A/DP	UU16G	05/14/12	1811	5687770	3.314	4924783	15.118
36	410B/DP	UU16H	05/14/12	1832	5336108	3.311	4946562	15.118
37	410C/DP	UU16I	05/14/12	1853	5259463	3.315	4648333	15.118
38	410C/DP MS	UU16IMS	05/14/12	1914	5248083	3.313	4729637	15.117
39	410C/DP MSD	UU16IMSD	05/14/12	1935	5249735	3.312	4550277	15.117
40	410A/NSM	UU16J	05/14/12	1956	5294836	3.314	4599245	15.118
41	410B/NSM	UU16K	05/14/12	2017	5515464	3.313	4873587	15.118
42		AR1254	05/14/12	2038	5719374	3.314	4798340	15.118
43		AR1660	05/14/12	2059	4538113	3.314	3913783	15.118

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB35 ID: 0.53(mm) Instrument ID: ECD7

Init. Calib. Date: 05/05/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
				ICAL MIDPT	9156558	4.174	6845779	15.782
				UPPER LIMIT	18313116	4.274	13691558	15.882
				LOWER LIMIT	4578279	4.074	3422890	15.682
	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
01	ZZZZZ	ZZZZZ	05/05/12	1422	8788529	4.174	6633649	15.783
02		0.25 PPM AR1	05/05/12	1443	9156558	4.174	6845779	15.782
03		0.02 PPM AR1	05/05/12	1504	9090803	4.174	6809435	15.782
04		0.05 PPM AR1	05/05/12	1525	9058816	4.173	6784358	15.783
05		1 PPM AR1660	05/05/12	1546	8875438	4.175	6866104	15.782
06		0.1 PPM AR16	05/05/12	1607	9078945	4.174	6921355	15.782
07		0.5 PPM AR16	05/05/12	1628	8943986	4.175	6823780	15.783
08		AR1242	05/05/12	1649	8736979	4.173	6696727	15.783
09		AR1248	05/05/12	1709	9041877	4.173	6930163	15.781
10		AR1254	05/05/12	1730	8969858	4.173	6933460	15.782
11		AR2162	05/05/12	1751	8970246	4.172	7017153	15.781
12		AR3268	05/05/12	1812	9076587	4.173	6967699	15.780
13	ZZZZZ	ZZZZZ	05/05/12	1833	9038755	4.169	6967518	15.782
14	ZZZZZ	ZZZZZ	05/05/12	1854	9156078	4.170	7050442	15.782
15	ZZZZZ	ZZZZZ	05/05/12	1915	8986504	4.171	6937342	15.781
16	ZZZZZ	ZZZZZ	05/05/12	1936	9187197	4.173	7034723	15.782
17	ZZZZZ	ZZZZZ	05/05/12	1957	9050043	4.172	7038220	15.782
18	ZZZZZ	ZZZZZ	05/05/12	2018	9155686	4.173	7046106	15.781
19		AR1242	05/14/12	1209	8447584	4.168	6946093	15.775
20		AR1660	05/14/12	1230	7041855	4.165	5831874	15.775
21	ZZZZZ	ZZZZZ	05/14/12	1251	24732276*	4.164	21715326*	15.774
22	ZZZZZ	ZZZZZ	05/14/12	1312	24932308*	4.164	21954650*	15.775
23	410C/NSM	UU16L	05/14/12	1400	7900017	4.114	6837096	15.770
24	UU16MBS1	UU16MBS1	05/14/12	1421	8947260	4.149	7622609	15.774
25	UU16LCSS1	UU16LCSS1	05/14/12	1442	9053355	4.158	7781260	15.775
26	UU16LCSDS1	UU16LCSDS1	05/14/12	1503	9298612	4.163	7909474	15.775
27	401A/DP	UU16A	05/14/12	1524	8777800	4.161	7522983	15.775
28	401B/DP	UU16B	05/14/12	1545	8898985	4.164	7587798	15.775
29	401C/DP	UU16C	05/14/12	1606	9092704	4.161	7532210	15.776
30	401A/NSM	UU16D	05/14/12	1627	8752083	4.166	7267635	15.776
31	401B/NSM	UU16E	05/14/12	1648	8931361	4.165	7277036	15.776
32		AR1248	05/14/12	1708	8594973	4.164	6920550	15.776

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

FORM 8
PCB INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

ARI Job No.: UU16 Project: P.O.P T4 MAINTENANCE

GC Column: ZB35 ID: 0.53(mm) Instrument ID: ECD7

Init. Calib. Date: 05/05/12

THE ANALYTICAL SEQUENCE OF PERFORMANCE EVALUATION MIXTURES, BLANKS, SAMPLES, AND STANDARDS IS GIVEN BELOW:

					IS1 AREA	RT	IS2 AREA	RT
				ICAL MIDPT	9156558	4.174	6845779	15.782
				UPPER LIMIT	18313116	4.274	13691558	15.882
				LOWER LIMIT	4578279	4.074	3422890	15.682
	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME	IS1 AREA	RT	IS2 AREA	RT
33		AR1660	05/14/12	1729	7329389	4.163	5881567	15.774
34	401C/NSM	UU16F	05/14/12	1750	8619324	4.163	7339524	15.774
35	410A/DP	UU16G	05/14/12	1811	9044355	4.163	7491316	15.774
36	410B/DP	UU16H	05/14/12	1832	8568499	4.161	7194097	15.774
37	410C/DP	UU16I	05/14/12	1853	8367132	4.163	7010938	15.774
38	410C/DP MS	UU16IMS	05/14/12	1914	8286286	4.162	7083840	15.773
39	410C/DP MSD	UU16IMSD	05/14/12	1935	8141751	4.162	6817923	15.774
40	410A/NSM	UU16J	05/14/12	1956	8177140	4.163	7147415	15.773
41	410B/NSM	UU16K	05/14/12	2017	8863343	4.163	7335191	15.774
42		AR1254	05/14/12	2038	8973555	4.162	6941796	15.774
43		AR1660	05/14/12	2059	7327936	4.163	5738586	15.775

IS1 = 1-Bromo-2-Nitrobenzene RT Window = RT +/- 0.1 min
IS2 = Hexabromobiphenyl

* Indicates value outside QC Limits

TPHD Analysis
Report and Summary QC Forms

ARI Job ID: UU16

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
TOTAL DIESEL RANGE HYDROCARBONS
NWTPHD by GC/FID-Silica and Acid Cleaned
Page 1 of 1
Matrix: Sediment

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00

Data Release Authorized:
Reported: 05/16/12

ARI ID	Sample ID	Extraction Date	Analysis Date	EFV DL	Range	MDL	RL	Result
MB-051112	Method Blank	05/11/12	05/12/12	1.00	Diesel	1.3	5.0	< 5.0 U
12-8723	HC ID: ---		FID4A	1.0	Motor Oil	1.6	10	< 10 U
					o-Terphenyl			92.6%
UU16A	401A/DP	05/11/12	05/12/12	1.00	Diesel	2.3	8.9	< 8.9 U
12-8723	HC ID: ---		FID4A	1.0	Motor Oil	2.8	18	< 18 U
					o-Terphenyl			63.6%
UU16B	401B/DP	05/11/12	05/12/12	1.00	**Diesel**	**1.9**	**7.5**	**21**
12-8724	HC ID: **DRO/MOTOR OIL**		FID4A	1.0	**Motor Oil**	**2.4**	**15**	**32**
					o-Terphenyl			73.8%
UU16C	401C/DP	05/11/12	05/12/12	1.00	**Diesel**	**2.5**	**9.8**	**11**
12-8725	HC ID: **DIESEL/MOTOR OIL**		FID4A	1.0	**Motor Oil**	**3.1**	**20**	**32**
					o-Terphenyl			73.9%
UU16G	410A/DP	05/11/12	05/12/12	1.00	**Diesel**	**2.1**	**8.2**	**10**
12-8729	HC ID: **DRO/MOTOR OIL**		FID4A	1.0	**Motor Oil**	**2.6**	**16**	**150**
					o-Terphenyl			65.6%
UU16H	410B/DP	05/11/12	05/12/12	1.00	Diesel	1.7	6.7	< 6.7 U
12-8730	HC ID: ---		FID4A	1.0	Motor Oil	2.1	13	< 13 U
					o-Terphenyl			63.9%
UU16I	410C/DP	05/11/12	05/12/12	1.00	**Diesel**	**1.9**	**7.3**	**20**
12-8731	HC ID: **DRO/MOTOR OIL**		FID4A	1.0	**Motor Oil**	**2.3**	**15**	**33**
					o-Terphenyl			56.5%

Reported in mg/kg (ppm)

EFV-Effective Final Volume in mL.
DL-Dilution of extract prior to analysis.
RL-Reporting limit.

Diesel quantitation on total peaks in the range from C12 to C24.
Motor Oil quantitation on total peaks in the range from C24 to C38.
HC ID: DRO/RRO indicate results of organics or additional hydrocarbons in ranges are not identifiable.

ANALYTICAL RESOURCES INCORPORATED

CLEANED TPHD SURROGATE RECOVERY SUMMARY

Matrix: Sediment

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00

Client ID	OTER	TOT OUT
MB-051112	92.6%	0
LCS-051112	95.3%	0
LCSD-051112	86.6%	0
401A/DP	63.6%	0
401A/DP MS	76.1%	0
401A/DP MSD	74.0%	0
401B/DP	73.8%	0
401C/DP	73.9%	0
410A/DP	65.6%	0
410B/DP	63.9%	0
410C/DP	56.5%	0

	LCS/MB LIMITS	QC LIMITS
(OTER) = o-Terphenyl	(50-150)	(50-150)

Prep Method: SW3546
Log Number Range: 12-8723 to 12-8731

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: 401A/DP**
Page 1 of 1 **MS/MSD**

Lab Sample ID: UU16A
LIMS ID: 12-8723
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted MS/MSD: 05/11/12

Date Analyzed MS: 05/12/12 16:32
MSD: 05/12/12 16:56
Instrument/Analyst MS: FID/MH
MSD: FID/MH

Sample Amount MS: 5.68 g-dry-wt
MSD: 5.62 g-dry-wt
Final Extract Volume MS: 1.0 mL
MSD: 1.0 mL
Dilution Factor MS: 1.0
MSD: 1.0
Percent Moisture: 45.1%

Range	Sample	MS	Spike Added-MS	MS Recovery	MSD	Spike Added-MSD	MSD Recovery	RPD
Diesel	< 8.9	192	264	72.7%	187	267	70.0%	2.6%

TPHD Surrogate Recovery

	MS	MSD
o-Terphenyl	76.1%	74.0%

Results reported in mg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
NWTPHD by GC/FID-Silica and Acid Cleaned **Sample ID: LCS-051112**
Page 1 of 1 **LCS/LCSD**

Lab Sample ID: LCS-051112
LIMS ID: 12-8723
Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Date Extracted LCS/LCSD: 05/11/12

Date Analyzed LCS: 05/12/12 15:19
LCSD: 05/12/12 15:44
Instrument/Analyst LCS: FID/MH
LCSD: FID/MH

Sample Amount LCS: 10.0 g
LCSD: 10.0 g
Final Extract Volume LCS: 1.0 mL
LCSD: 1.0 mL
Dilution Factor LCS: 1.0
LCSD: 1.0

Range	LCS	Spike Added-LCS	LCS Recovery	LCSD	Spike Added-LCSD	LCSD Recovery	RPD
Diesel	118	150	78.7%	117	150	78.0%	0.9%

TPHD Surrogate Recovery

	LCS	LCSD
o-Terphenyl	95.3%	86.6%

Results reported in mg/kg
RPD calculated using sample concentrations per SW846.

ANALYTICAL RESOURCES INCORPORATED

TOTAL DIESEL RANGE HYDROCARBONS-EXTRACTION REPORT

Matrix: Sediment
Date Received: 05/11/12

ARI Job: UU16
Project: P.O.P. T4 Maintenance
15753-00

ARI ID	Client ID	Client Amt	Final Vol	Basis	Prep Date
12-8723-051112MB1	Method Blank	10.0 g	1.00 mL	-	05/11/12
12-8723-051112LCS1	Lab Control	10.0 g	1.00 mL	-	05/11/12
12-8723-051112LCSD1	Lab Control Dup	10.0 g	1.00 mL	-	05/11/12
12-8723-UU16A	401A/DP	5.59 g	1.00 mL	D	05/11/12
12-8723-UU16AMS	401A/DP	5.68 g	1.00 mL	D	05/11/12
12-8723-UU16AMSD	401A/DP	5.62 g	1.00 mL	D	05/11/12
12-8724-UU16B	401B/DP	6.68 g	1.00 mL	D	05/11/12
12-8725-UU16C	401C/DP	5.12 g	1.00 mL	D	05/11/12
12-8729-UU16G	410A/DP	6.06 g	1.00 mL	D	05/11/12
12-8730-UU16H	410B/DP	7.51 g	1.00 mL	D	05/11/12
12-8731-UU16I	410C/DP	6.84 g	1.00 mL	D	05/11/12

Basis: D=Dry Weight W=As Received

4

TPH METHOD BLANK SUMMARY

BLANK NO.: UU16MBS1

Lab Name: ANALYTICAL RESOURCES INC
Client: HART CROWSER

SDG No.: UU16
Project No.: P.O.P T4 MAINTENANCE

Date Extracted: 05/11/12
Matrix: SOLID

Date Analyzed : 05/12/12
Instrument ID : FID4A

Time Analyzed : 1455

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, and MSD:

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED
01	UU16LCSS1	UU16LCSS1	05/12/12
02	UU16LCSDS1	UU16LCSDS1	05/12/12
03	401A/DP	UU16A	05/12/12
04	401A/DP MS	UU16AMS	05/12/12
05	401A/DP MSD	UU16AMSD	05/12/12
06	401B/DP	UU16B	05/12/12
07	401C/DP	UU16C	05/12/12
08	410A/DP	UU16G	05/12/12
09	410B/DP	UU16H	05/12/12
10	410C/DP	UU16I	05/12/12
11			
12			
13			
14			
15			
16			
17			
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19			
20			
21			
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29			
30			

FORM IV TPH

6a

DIESEL INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES, INC. Client: HART CROWSER

Instrument: FID4A.I Project: P.O.P. T4 MAINTENANCE

Calibration Date: 08-FEB-2012 SDG No.: UU16

Diesel Range	RF1 50	RF2 100	RF3 250	RF4 500	RF5 1000	RF6 2500	Ave RF	%RSD
WA Diesel	14949	15145	15065	15164	14702	15451	15079	1.6
AK Diesel	17627	17893	17841	17989	17500	18388	17873	1.7
OR Diesel	17897	18055	17928	18068	17586	18468	18000	1.6
Cal Diesel	17603	17864	17799	17951	17467	18344	17838	1.7
o-Terph	19594	19585	19531	19489	19354	20804	19726	2.7

<- Indicates %RSD outside limits
Surrogate areas are not included in Diesel RF calculation.

Quant Ranges : WA Diesel C12-C24 (4.212-7.837)
AK Diesel C10-C25 (3.212-8.084)
OR Diesel C10-C28 (3.212-8.776)
Cal Diesel C10-C24 (3.212-7.837)

Calibration Files	Analysis Time
0208a009.d	08-FEB-2012 08:33
0208a008.d	08-FEB-2012 08:09
0208a007.d	08-FEB-2012 07:46
0208a006.d	08-FEB-2012 07:22
0208a005.d	08-FEB-2012 06:59
0208a004.d	08-FEB-2012 06:35

6a

NW MOTOR OIL RANGE INITIAL CALIBRATION

Lab Name: ANALYTICAL RESOURCES, INC.

Client: HART CROWSER

Instrument: FID4A.I

Project: P.O.P. T4 MAINTANANCE

Calibration Date: 19-APR-2012

SDG No.: UU16

Product Range	RF1 100	RF2 250	RF3 500	RF4 1000	RF5 2500	RF6 5000	Ave RF	%RSD
WA M.Oil C24-C38	12890	11264	11615	11821	10866	11025	11580	6.3
Triac Surr	13307	14068	15103	15717	15129	*****	14665	6.57

<- Indicates %RSD outside limits
Surrogate areas are not included in Motor Oil RF calculation.

Calibration Files	Analysis Time
0419a037.d	19-APR-2012 21:02
0419a036.d	19-APR-2012 20:38
0419a035.d	19-APR-2012 20:14
0419a034.d	19-APR-2012 19:50
0419a033.d	19-APR-2012 19:26
0419a032.d	19-APR-2012 19:01

7a

DIESEL CONTINUING CALIBRATION VERIFICATION

Lab Name: ANALYTICAL RESOURCES, INC.
Client: 20120512

ICal Date: 08-FEB-2012
Project:

CCal Date: 12-MAY-2012
SDG No.: 20120512

Analysis Time: 13:42
Lab ID: DIESEL #2

Instrument: FID4A.I
Lab File Name: 0512a018.d

Diesel Range	Area*	CalcAmnt	NomAmnt	% D
WADies(C12-C24)	3893395	258.2	250	3.3
AK102 (C10-C25)	4641859	259.7	250	3.9
Terphenyl	829109	42.0	45	-6.6

* Surrogate areas are subtracted from range areas
<- Indicates a %D outside QC limits

Quant Ranges : WA Diesel C12-C24
AK Diesel C10-C25

7a

MOTOR OIL CONTINUING CALIBRATION VERIFICATION

Lab Name: ANALYTICAL RESOURCES, INC. Client: 20120512

ICal Date: 19-APR-2012 Project:

CCal Date: 12-MAY-2012 SDG No.: 20120512

Analysis Time: 14:07 Lab ID: MOIL #2

Instrument: FID4A.I Lab File Name: 0512a019.d

M.oil Range	Area*	CalcAmnt	NomAmnt	% D	
WAMoil(C24-C38)	5667127	488.7	500	-2.3	
AK103 (C25-C36)	5005495	645.1	500	29.0	<-
CRUDE(Tol-C40)	6691951	886.0	500	77.2	
n-Triacontane	786999	53.7	45	19.3	<-

* Surrogate areas are subtracted from range areas

<- Indicates a %D outside QC limits

Quant Ranges : WA M.Oil C24-C38
AK M.Oil C25-C36

7a

DIESEL CONTINUING CALIBRATION VERIFICATION

Lab Name: ANALYTICAL RESOURCES, INC.
Client: 20120512

ICal Date: 08-FEB-2012
Project:

CCal Date: 12-MAY-2012
SDG No.: 20120512

Analysis Time: 19:21
Lab ID: DIESEL #3

Instrument: FID4A.I
Lab File Name: 0512a032.d

Diesel Range	Area*	CalcAmnt	NomAmnt	% D
WADies(C12-C24)	3724168	247.0	250	-1.2
AK102 (C10-C25)	4413508	246.9	250	-1.2
Terphenyl	795062	40.3	45	-10.4

* Surrogate areas are subtracted from range areas
<- Indicates a %D outside QC limits

Quant Ranges : WA Diesel C12-C24
AK Diesel C10-C25

7a

MOTOR OIL CONTINUING CALIBRATION VERIFICATION

Lab Name: ANALYTICAL RESOURCES, INC. Client: 20120512

ICal Date: 19-APR-2012 Project:

CCal Date: 12-MAY-2012 SDG No.: 20120512

Analysis Time: 19:45 Lab ID: MOIL #3

Instrument: FID4A.I Lab File Name: 0512a033.d

M.oil Range	Area*	CalcAmnt	NomAmnt	% D
WAMoil(C24-C38)	5393358	465.1	500	-7.0
AK103 (C25-C36)	4826777	622.1	500	24.4
CRUDE(Tol-C40)	6456751	854.9	500	71.0
n-Triacontane	744989	50.8	45	12.9

* Surrogate areas are subtracted from range areas
<- Indicates a %D outside QC limits

Quant Ranges : WA M.Oil C24-C38
AK M.Oil C25-C36

TPH ANALYTICAL SEQUENCE

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

SDG No.: UU16 Project: P.O.P. T4 MAINTANANCE

Instrument ID: FID4A GC Column: RTX-1

Run Date: 02/08/12

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, AND STANDARDS, IS GIVEN BELOW:

SURROGATE RT FROM DAILY STANDARD
TERPH: 6.38 TRIAC: 9.25

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TERPH RT #	TRIAC RT #
01		RINSE	02/08/12	0525	6.38	9.25
02		RT	02/08/12	0548	6.38	9.25
03		IB	02/08/12	0612	6.38	9.25
04		DIESEL 2500	02/08/12	0635	6.43*	9.24
05		DIESEL 1000	02/08/12	0659	6.40	9.25
06		DIESEL 500	02/08/12	0722	6.39	9.24
07		DIESEL 250	02/08/12	0746	6.38	9.26
08		DIESEL 100	02/08/12	0809	6.37	9.26
09		DIESEL 50	02/08/12	0833	6.38	9.27
10		DIESEL ICV	02/08/12	0857	6.38	9.25

QC LIMITS

TERPH = o-terph (+/- 0.05 MINUTES)
TRIAC = Triacon Surr (+/- 0.05 MINUTES)

* Values outside of QC limits.

FORM VIII TPH

TPH ANALYTICAL SEQUENCE

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

SDG No.: UU16 Project: P.O.P. T4 MAINTANANCE

Instrument ID: FID4A GC Column: RTX-1

Run Date: 04/19/12

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, AND STANDARDS, IS GIVEN BELOW:

SURROGATE RT FROM DAILY STANDARD
TERPH: 6.32 TRIAC: 9.18

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TERPH RT #	TRIAC RT #
01		RINSE	04/19/12	1724	6.32	9.18
02		RT	04/19/12	1748	6.32	9.18
03		IB	04/19/12	1813	6.32	9.18
04		DIESEL #1	04/19/12	1837	6.32	9.19
05		MOIL 5000	04/19/12	1901	6.32	9.27*
06		MOIL 2500	04/19/12	1926	6.32	9.23
07		MOIL 1000	04/19/12	1950	6.32	9.20
08		MOIL 500	04/19/12	2014	6.32	9.18
09		MOIL 250	04/19/12	2038	6.32	9.17
10		MOIL 100	04/19/12	2102	6.34	9.17
11		MOIL ICV	04/19/12	2126	6.33	9.18

QC LIMITS

TERPH = o-terph (+/- 0.05 MINUTES)
TRIAC = Triacon Surr (+/- 0.05 MINUTES)

* Values outside of QC limits.

TPH ANALYTICAL SEQUENCE

Lab Name: ANALYTICAL RESOURCES INC Client: HART CROWSER

SDG No.: UU16 Project: P.O.P T4 MAINTENANCE

Instrument ID: FID4A GC Column: RTX-1

Run Date: 05/12/12

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, AND STANDARDS, IS GIVEN BELOW:

SURROGATE RT FROM DAILY STANDARD
TERPH: 6.31 TRIAC: 9.20

	CLIENT SAMPLE NO.	LAB SAMPLE ID	DATE ANALYZED	TIME ANALYZED	TERPH RT #	TRIAC RT #
01	RT	RT	05/12/12	0711	6.31	9.20
02	IB	IB	05/12/12	0734	6.31	9.19
03	ZZZZZ	DIESEL #1	05/12/12	0758	6.31	9.21
04	ZZZZZ	MOIL #1	05/12/12	0822	6.31	9.20
05	ZZZZZ	MINERALOIL #	05/12/12	0845	6.31	9.20
06	ZZZZZ	ZZZZZ	05/12/12	0914	6.31	9.19
07	ZZZZZ	ZZZZZ	05/12/12	0938	6.31	9.19
08	ZZZZZ	ZZZZZ	05/12/12	1002	6.31	9.19
09	ZZZZZ	ZZZZZ	05/12/12	1027	6.31	9.18
10	ZZZZZ	ZZZZZ	05/12/12	1051	6.31	9.19
11	ZZZZZ	ZZZZZ	05/12/12	1116	6.32	9.19
12	ZZZZZ	ZZZZZ	05/12/12	1141	6.32	9.19
13	ZZZZZ	ZZZZZ	05/12/12	1205	6.31	9.19
14	ZZZZZ	ZZZZZ	05/12/12	1230	6.31	9.23
15	ZZZZZ	ZZZZZ	05/12/12	1254	6.31	9.25
16	ZZZZZ	ZZZZZ	05/12/12	1318	6.31	9.20
17	DIESEL #2	DIESEL #2	05/12/12	1342	6.31	9.21
18	MOIL #2	MOIL #2	05/12/12	1407	6.34	9.20
19		MINERALOIL #	05/12/12	1431	6.32	9.21
20	UU16MBS1	UU16MBS1	05/12/12	1455	6.31	9.19
21	UU16LCSS1	UU16LCSS1	05/12/12	1519	6.32	9.19
22	UU16LCSDS1	UU16LCSDS1	05/12/12	1544	6.32	9.19
23	401A/DP	UU16A	05/12/12	1608	6.31	9.19
24	401A/DP MS	UU16AMS	05/12/12	1632	6.31	9.20
25	401A/DP MSD	UU16AMSD	05/12/12	1656	6.31	9.19
26	401B/DP	UU16B	05/12/12	1720	6.31	9.19
27	401C/DP	UU16C	05/12/12	1745	6.31	9.19
28	410A/DP	UU16G	05/12/12	1809	6.31	9.22
29	410B/DP	UU16H	05/12/12	1833	6.31	9.19
30	410C/DP	UU16I	05/12/12	1857	6.31	9.19
31	DIESEL #3	DIESEL #3	05/12/12	1921	6.31	9.19
32	MOIL #3	MOIL #3	05/12/12	1945	6.29	9.20

QC LIMITS

TERPH = o-terph (+/- 0.05 MINUTES)
TRIAC = Triacon Surr (+/- 0.05 MINUTES)

* Values outside of QC limits.

FORM VIII TPH

Metals Analysis
Report and Summary QC Forms

ARI Job ID: UU16

Cover Page

INORGANIC ANALYSIS DATA PACKAGE

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc

SDG: UU16

CLIENT ID	ARI ID	ARI LIMS ID	REPREP
401A/DP	UU16A	12-8723	
401A/DPD	UU16ADUP	12-8723	
401A/DPS	UU16ASPK	12-8723	
401B/DP	UU16B	12-8724	
PBS	UU16MB1	12-8724	
LCSS	UU16MB1SPK	12-8724	
401C/DP	UU16C	12-8725	
401A/NSM	UU16D	12-8726	
401B/NSM	UU16E	12-8727	
401C/NSM	UU16F	12-8728	
410A/DP	UU16G	12-8729	
410B/DP	UU16H	12-8730	
410C/DP	UU16I	12-8731	
410A/NSM	UU16J	12-8732	
410B/NSM	UU16K	12-8733	
410C/NSM	UU16L	12-8734	

Were ICP interelement corrections applied ?	Yes/No	YES
Were ICP background corrections applied ?	Yes/No	YES
If yes - were raw data generated before application of background corrections ?	Yes/No	NO

Comments: _____

THIS DATA PACKAGE HAS BEEN REVIEWED AND AUTHORIZED FOR RELEASE BY:

Signature: _____ Name: Jay Kuhn

Date: 6/15/12 Title: Inorganics Director

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: 401A/DP
SAMPLE

Lab Sample ID: UU16A
LIMS ID: 12-8723
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Percent Total Solids: 52.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	05/11/12	200.8	05/14/12	7440-36-0	Antimony	0.024	0.4	0.4	U
3050B	05/11/12	200.8	05/14/12	**7440-38-2**	**Arsenic**	0.16	0.4	**4.1**	
3050B	05/11/12	200.8	05/14/12	**7440-43-9**	**Cadmium**	0.022	0.2	**0.3**	
3050B	05/11/12	200.8	05/14/12	**7440-47-3**	**Chromium**	0.35	5	**27**	
3050B	05/11/12	200.8	05/14/12	**7440-50-8**	**Copper**	0.066	0.9	**39.4**	
3050B	05/11/12	200.8	05/14/12	**7439-92-1**	**Lead**	0.087	0.2	**15.6**	
CLP	05/11/12	7471A	05/14/12	**7439-97-6**	**Mercury**	0.0018	0.03	**0.07**	
3050B	05/11/12	200.8	05/14/12	**7440-02-0**	**Nickel**	0.090	0.9	**25.6**	
3050B	05/11/12	200.8	05/14/12	7440-22-4	Silver	0.015	0.4	0.4	U
3050B	05/11/12	200.8	05/14/12	**7440-66-6**	**Zinc**	0.63	7	**115**	

Reported in mg/kg-dry (ppm).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: 401B/DP
SAMPLE

Lab Sample ID: UU16B
LIMS ID: 12-8724
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Percent Total Solids: 63.2%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	05/11/12	200.8	05/14/12	7440-36-0	Antimony	0.019	0.3	0.3	U
3050B	05/11/12	200.8	05/14/12	**7440-38-2**	**Arsenic**	0.13	0.3	**3.7**	
3050B	05/11/12	200.8	05/14/12	**7440-43-9**	**Cadmium**	0.018	0.1	**0.4**	
3050B	05/11/12	200.8	05/14/12	**7440-47-3**	**Chromium**	0.28	4	**24**	
3050B	05/11/12	200.8	05/14/12	**7440-50-8**	**Copper**	0.053	0.7	**31.4**	
3050B	05/11/12	200.8	05/14/12	**7439-92-1**	**Lead**	0.069	0.1	**18.5**	
CLP	05/11/12	7471A	05/14/12	**7439-97-6**	**Mercury**	0.0017	0.03	**0.09**	
3050B	05/11/12	200.8	05/14/12	**7440-02-0**	**Nickel**	0.072	0.7	**24.8**	
3050B	05/11/12	200.8	05/14/12	7440-22-4	Silver	0.012	0.3	0.3	U
3050B	05/11/12	200.8	05/14/12	**7440-66-6**	**Zinc**	0.50	6	**132**	

Reported in mg/kg-dry (ppm).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: 401C/DP**
Page 1 of 1 **SAMPLE**

Lab Sample ID: UU16C
LIMS ID: 12-8725
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Percent Total Solids: 45.9%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	05/11/12	200.8	05/14/12	7440-36-0	Antimony	0.027	0.4	0.4	U
3050B	05/11/12	200.8	05/14/12	**7440-38-2**	**Arsenic**	0.18	0.4	**4.6**	
3050B	05/11/12	200.8	05/14/12	7440-43-9	Cadmium	0.025	0.2	0.2	U
3050B	05/11/12	200.8	05/14/12	**7440-47-3**	**Chromium**	0.39	5	**31**	
3050B	05/11/12	200.8	05/14/12	**7440-50-8**	**Copper**	0.074	1	**47**	
3050B	05/11/12	200.8	05/14/12	**7439-92-1**	**Lead**	0.096	0.2	**14.1**	
CLP	05/11/12	7471A	05/14/12	**7439-97-6**	**Mercury**	0.0023	0.05	**0.07**	
3050B	05/11/12	200.8	05/14/12	**7440-02-0**	**Nickel**	0.10	1	**31**	
3050B	05/11/12	200.8	05/14/12	7440-22-4	Silver	0.016	0.4	0.4	U
3050B	05/11/12	200.8	05/14/12	**7440-66-6**	**Zinc**	0.69	8	**111**	

Reported in mg/kg-dry (ppm).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: 401A/NSM
SAMPLE

Lab Sample ID: UU16D
LIMS ID: 12-8726
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Percent Total Solids: 78.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	05/11/12	200.8	05/14/12	7440-36-0	Antimony	0.016	0.2	0.2	U
3050B	05/11/12	200.8	05/14/12	**7440-38-2**	**Arsenic**	0.11	0.2	**3.3**	
3050B	05/11/12	200.8	05/14/12	**7440-43-9**	**Cadmium**	0.015	0.1	**0.2**	
3050B	05/11/12	200.8	05/14/12	**7440-47-3**	**Chromium**	0.23	3	**16**	
3050B	05/11/12	200.8	05/14/12	**7440-50-8**	**Copper**	0.044	0.6	**20.5**	
3050B	05/11/12	200.8	05/14/12	**7439-92-1**	**Lead**	0.057	0.1	**9.5**	
CLP	05/11/12	7471A	05/14/12	**7439-97-6**	**Mercury**	0.0015	0.03	**0.08**	
3050B	05/11/12	200.8	05/14/12	**7440-02-0**	**Nickel**	0.059	0.6	**20.1**	
3050B	05/11/12	200.8	05/14/12	7440-22-4	Silver	0.0097	0.2	0.2	U
3050B	05/11/12	200.8	05/14/12	**7440-66-6**	**Zinc**	0.41	5	**78**	

Reported in mg/kg-dry (ppm).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: 401B/NSM
SAMPLE

Lab Sample ID: UU16E
LIMS ID: 12-8727
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Percent Total Solids: 83.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	05/11/12	200.8	05/14/12	7440-36-0	Antimony	0.015	0.2	0.2	U
3050B	05/11/12	200.8	05/14/12	**7440-38-2**	**Arsenic**	0.099	0.2	**2.4**	
3050B	05/11/12	200.8	05/14/12	7440-43-9	Cadmium	0.014	0.1	0.1	U
3050B	05/11/12	200.8	05/14/12	**7440-47-3**	**Chromium**	0.22	3	**13**	
3050B	05/11/12	200.8	05/14/12	**7440-50-8**	**Copper**	0.041	0.6	**15.2**	
3050B	05/11/12	200.8	05/14/12	**7439-92-1**	**Lead**	0.054	0.1	**2.4**	
CLP	05/11/12	7471A	05/14/12	7439-97-6	Mercury	0.0014	0.03	0.03	U
3050B	05/11/12	200.8	05/14/12	**7440-02-0**	**Nickel**	0.056	0.6	**18.5**	
3050B	05/11/12	200.8	05/14/12	7440-22-4	Silver	0.0091	0.2	0.2	U
3050B	05/11/12	200.8	05/14/12	**7440-66-6**	**Zinc**	0.39	5	**46**	

Reported in mg/kg-dry (ppm).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: 401C/NSM
SAMPLE

Lab Sample ID: UU16F
LIMS ID: 12-8728
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Percent Total Solids: 56.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	05/11/12	200.8	05/14/12	7440-36-0	Antimony	0.021	0.3	0.3	U
3050B	05/11/12	200.8	05/14/12	**7440-38-2**	**Arsenic**	0.14	0.3	**3.7**	
3050B	05/11/12	200.8	05/14/12	**7440-43-9**	**Cadmium**	0.020	0.2	**0.2**	
3050B	05/11/12	200.8	05/14/12	**7440-47-3**	**Chromium**	0.31	4	**28**	
3050B	05/11/12	200.8	05/14/12	**7440-50-8**	**Copper**	0.059	0.8	**42.0**	
3050B	05/11/12	200.8	05/14/12	**7439-92-1**	**Lead**	0.076	0.2	**14.2**	
CLP	05/11/12	7471A	05/14/12	**7439-97-6**	**Mercury**	0.0022	0.04	**0.06**	
3050B	05/11/12	200.8	05/14/12	**7440-02-0**	**Nickel**	0.080	0.8	**27.5**	
3050B	05/11/12	200.8	05/14/12	7440-22-4	Silver	0.013	0.3	0.3	U
3050B	05/11/12	200.8	05/14/12	**7440-66-6**	**Zinc**	0.55	7	**98**	

Reported in mg/kg-dry (ppm).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: 410A/DP
SAMPLE

Lab Sample ID: UU16G
LIMS ID: 12-8729
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Percent Total Solids: 54.6%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	05/11/12	200.8	05/14/12	7440-36-0	Antimony	0.023	0.4	0.4	U
3050B	05/11/12	200.8	05/14/12	**7440-38-2**	**Arsenic**	0.16	0.4	**3.6**	
3050B	05/11/12	200.8	05/14/12	7440-43-9	Cadmium	0.021	0.2	0.2	U
3050B	05/11/12	200.8	05/14/12	**7440-47-3**	**Chromium**	0.34	4	**22**	
3050B	05/11/12	200.8	05/14/12	**7440-50-8**	**Copper**	0.064	0.9	**31.7**	
3050B	05/11/12	200.8	05/14/12	**7439-92-1**	**Lead**	0.084	0.2	**9.5**	
CLP	05/11/12	7471A	05/14/12	7439-97-6	Mercury	0.0018	0.04	0.04	U
3050B	05/11/12	200.8	05/14/12	**7440-02-0**	**Nickel**	0.087	0.9	**23.7**	
3050B	05/11/12	200.8	05/14/12	7440-22-4	Silver	0.014	0.4	0.4	U
3050B	05/11/12	200.8	05/14/12	**7440-66-6**	**Zinc**	0.61	7	**85**	

Reported in mg/kg-dry (ppm).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: 410B/DP
SAMPLE

Lab Sample ID: UU16H
LIMS ID: 12-8730
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Percent Total Solids: 67.3%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	05/11/12	200.8	05/14/12	7440-36-0	Antimony	0.018	0.3	0.3	U
3050B	05/11/12	200.8	05/14/12	**7440-38-2**	**Arsenic**	0.12	0.3	**2.9**	
3050B	05/11/12	200.8	05/14/12	7440-43-9	Cadmium	0.017	0.1	0.1	U
3050B	05/11/12	200.8	05/14/12	**7440-47-3**	**Chromium**	0.27	4	**16**	
3050B	05/11/12	200.8	05/14/12	**7440-50-8**	**Copper**	0.051	0.7	**24.5**	
3050B	05/11/12	200.8	05/14/12	**7439-92-1**	**Lead**	0.066	0.1	**8.3**	
CLP	05/11/12	7471A	05/14/12	**7439-97-6**	**Mercury**	0.0013	0.03	**0.03**	
3050B	05/11/12	200.8	05/14/12	**7440-02-0**	**Nickel**	0.069	0.7	**19.8**	
3050B	05/11/12	200.8	05/14/12	7440-22-4	Silver	0.011	0.3	0.3	U
3050B	05/11/12	200.8	05/14/12	**7440-66-6**	**Zinc**	0.48	6	**67**	

Reported in mg/kg-dry (ppm).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: 410C/DP
SAMPLE

Lab Sample ID: UU16I
LIMS ID: 12-8731
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Percent Total Solids: 63.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	05/11/12	200.8	05/14/12	7440-36-0	Antimony	0.020	0.3	0.3	U
3050B	05/11/12	200.8	05/14/12	**7440-38-2**	**Arsenic**	0.13	0.3	**3.8**	
3050B	05/11/12	200.8	05/14/12	**7440-43-9**	**Cadmium**	0.018	0.2	**0.6**	
3050B	05/11/12	200.8	05/14/12	**7440-47-3**	**Chromium**	0.29	4	**18**	
3050B	05/11/12	200.8	05/14/12	**7440-50-8**	**Copper**	0.055	0.8	**35.9**	
3050B	05/11/12	200.8	05/14/12	**7439-92-1**	**Lead**	0.072	0.2	**53.7**	
CLP	05/11/12	7471A	05/14/12	**7439-97-6**	**Mercury**	0.0014	0.03	**0.05**	
3050B	05/11/12	200.8	05/14/12	**7440-02-0**	**Nickel**	0.075	0.8	**22.7**	
3050B	05/11/12	200.8	05/14/12	7440-22-4	Silver	0.012	0.3	0.3	U
3050B	05/11/12	200.8	05/14/12	**7440-66-6**	**Zinc**	0.52	6	**146**	

Reported in mg/kg-dry (ppm).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: 410A/NSM
SAMPLE

Lab Sample ID: UU16J
LIMS ID: 12-8732
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Percent Total Solids: 59.1%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	05/11/12	200.8	05/14/12	7440-36-0	Antimony	0.021	0.3	0.3	U
3050B	05/11/12	200.8	05/14/12	**7440-38-2**	**Arsenic**	0.14	0.3	**3.4**	
3050B	05/11/12	200.8	05/14/12	7440-43-9	Cadmium	0.020	0.2	0.2	U
3050B	05/11/12	200.8	05/14/12	**7440-47-3**	**Chromium**	0.31	4	**22**	
3050B	05/11/12	200.8	05/14/12	**7440-50-8**	**Copper**	0.059	0.8	**31.4**	
3050B	05/11/12	200.8	05/14/12	**7439-92-1**	**Lead**	0.077	0.2	**13.7**	
CLP	05/11/12	7471A	05/14/12	**7439-97-6**	**Mercury**	0.0018	0.03	**0.07**	
3050B	05/11/12	200.8	05/14/12	**7440-02-0**	**Nickel**	0.081	0.8	**24.5**	
3050B	05/11/12	200.8	05/14/12	7440-22-4	Silver	0.013	0.3	0.3	U
3050B	05/11/12	200.8	05/14/12	**7440-66-6**	**Zinc**	0.56	7	**93**	

Reported in mg/kg-dry (ppm).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: 410B/NSM**
Page 1 of 1 **SAMPLE**

Lab Sample ID: UU16K
LIMS ID: 12-8733
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Percent Total Solids: 71.4%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	05/11/12	200.8	05/14/12	7440-36-0	Antimony	0.018	0.3	0.3	U
3050B	05/11/12	200.8	05/14/12	**7440-38-2**	**Arsenic**	0.12	0.3	**3.0**	
3050B	05/11/12	200.8	05/14/12	**7440-43-9**	**Cadmium**	0.017	0.1	**0.1**	
3050B	05/11/12	200.8	05/14/12	**7440-47-3**	**Chromium**	0.27	4	**18**	
3050B	05/11/12	200.8	05/14/12	**7440-50-8**	**Copper**	0.050	0.7	**26.8**	
3050B	05/11/12	200.8	05/14/12	**7439-92-1**	**Lead**	0.066	0.1	**19.1**	
CLP	05/11/12	7471A	05/14/12	7439-97-6	Mercury	0.0018	0.03	0.03	U
3050B	05/11/12	200.8	05/14/12	**7440-02-0**	**Nickel**	0.069	0.7	**20.0**	
3050B	05/11/12	200.8	05/14/12	7440-22-4	Silver	0.011	0.3	0.3	U
3050B	05/11/12	200.8	05/14/12	**7440-66-6**	**Zinc**	0.47	6	**79**	

Reported in mg/kg-dry (ppm).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: 410C/NSM
SAMPLE

Lab Sample ID: UU16L
LIMS ID: 12-8734
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Percent Total Solids: 71.0%

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	05/11/12	200.8	05/14/12	7440-36-0	Antimony	0.017	0.3	0.3	U
3050B	05/11/12	200.8	05/14/12	**7440-38-2**	**Arsenic**	0.11	0.3	**5.2**	
3050B	05/11/12	200.8	05/14/12	**7440-43-9**	**Cadmium**	0.015	0.1	**1.4**	
3050B	05/11/12	200.8	05/14/12	**7440-47-3**	**Chromium**	0.24	3	**21**	
3050B	05/11/12	200.8	05/14/12	**7440-50-8**	**Copper**	0.046	0.6	**43.5**	
3050B	05/11/12	200.8	05/14/12	**7439-92-1**	**Lead**	0.060	0.1	**201**	
CLP	05/11/12	7471A	05/14/12	**7439-97-6**	**Mercury**	0.0015	0.03	**0.06**	
3050B	05/11/12	200.8	05/14/12	**7440-02-0**	**Nickel**	0.063	0.6	**23.2**	
3050B	05/11/12	200.8	05/14/12	**7440-22-4**	**Silver**	0.010	0.3	**0.5**	
3050B	05/11/12	200.8	05/14/12	**7440-66-6**	**Zinc**	0.44	5	**265**	

Reported in mg/kg-dry (ppm).
U-Analyte undetected at given RL
RL-Reporting Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: 401A/DP
MATRIX SPIKE

Lab Sample ID: UU16A
LIMS ID: 12-8723
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

MATRIX SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Spike	Spike Added	% Recovery	Q
Antimony	200.8	0.4 U	0.4 U	4.61	0.0%	N
Arsenic	200.8	4.1	46.1	46.1	91.1%	
Cadmium	200.8	0.3	46.6	46.1	100%	
Chromium	200.8	27	67	46.1	86.8%	
Copper	200.8	39.4	85.2	46.1	99.3%	
Lead	200.8	15.6	61.7	46.1	100%	
Mercury	7471A	0.07	0.44	0.346	107%	
Nickel	200.8	25.6	73.5	46.1	104%	
Silver	200.8	0.4 U	44.9	46.1	97.4%	
Zinc	200.8	115	240	147	85.0%	

Reported in mg/kg-dry

N-Control Limit Not Met
H-% Recovery Not Applicable, Sample Concentration Too High
NA-Not Applicable, Analyte Not Spiked

Percent Recovery Limits: 75-125%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS
Page 1 of 1

Sample ID: 401A/DP
DUPLICATE

Lab Sample ID: UU16A
LIMS ID: 12-8723
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

MATRIX DUPLICATE QUALITY CONTROL REPORT

Analyte	Analysis Method	Sample	Duplicate	RPD	Control Limit	Q
Antimony	200.8	0.4 U	0.4 U	0.0%	+/- 0.4	L
Arsenic	200.8	4.1	3.7	10.3%	+/- 20%	
Cadmium	200.8	0.3	0.2	40.0%	+/- 0.2	L
Chromium	200.8	27	26	3.8%	+/- 20%	
Copper	200.8	39.4	36.2	8.5%	+/- 20%	
Lead	200.8	15.6	13.1	17.4%	+/- 20%	
Mercury	7471A	0.07	0.09	25.0%	+/- 0.03	L
Nickel	200.8	25.6	25.1	2.0%	+/- 20%	
Silver	200.8	0.4 U	0.4 U	0.0%	+/- 0.4	L
Zinc	200.8	115	103	11.0%	+/- 20%	

Reported in mg/kg-dry

*-Control Limit Not Met
L-RPD Invalid, Limit = Detection Limit

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: LAB CONTROL**

Lab Sample ID: UU16LCS
LIMS ID: 12-8724
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance 15753-00
Date Sampled: NA
Date Received: NA

BLANK SPIKE QUALITY CONTROL REPORT

Analyte	Analysis Method	Spike Found	Spike Added	% Recovery	Q
Antimony	200.8	2.5	2.5	100%	
Arsenic	200.8	25.8	25.0	103%	
Cadmium	200.8	24.9	25.0	99.6%	
Chromium	200.8	25.4	25.0	102%	
Copper	200.8	27.0	25.0	108%	
Lead	200.8	26.2	25.0	105%	
Mercury	7471A	0.48	0.50	96.0%	
Nickel	200.8	26.4	25.0	106%	
Silver	200.8	26.0	25.0	104%	
Zinc	200.8	82	80	102%	

Reported in mg/kg-dry

N-Control limit not met
NA-Not Applicable, Analyte Not Spiked
Control Limits: 80-120%

ANALYTICAL RESOURCES INCORPORATED

INORGANICS ANALYSIS DATA SHEET
TOTAL METALS **Sample ID: METHOD BLANK**

Lab Sample ID: UU16MB
LIMS ID: 12-8724
Matrix: Sediment
Data Release Authorized:
Reported: 05/15/12

QC Report No: UU16-Hart Crowser
Project: P.O.P. T4 Maintenance
15753-00
Date Sampled: NA
Date Received: NA

Percent Total Solids: NA

Prep Meth	Prep Date	Analysis Method	Analysis Date	CAS Number	Analyte	MDL	RL	Result	Q
3050B	05/11/12	200.8	05/14/12	7440-36-0	Antimony	0.013	0.2	0.2	U
3050B	05/11/12	200.8	05/14/12	7440-38-2	Arsenic	0.087	0.2	0.2	U
3050B	05/11/12	200.8	05/14/12	7440-43-9	Cadmium	0.012	0.1	0.1	U
3050B	05/11/12	200.8	05/14/12	7440-47-3	Chromium	0.038	0.5	0.5	U
3050B	05/11/12	200.8	05/14/12	7440-50-8	Copper	0.036	0.5	0.5	U
3050B	05/11/12	200.8	05/14/12	7439-92-1	Lead	0.047	0.1	0.1	U
CLP	05/11/12	7471A	05/14/12	7439-97-6	Mercury	0.0013	0.02	0.02	U
3050B	05/11/12	200.8	05/14/12	7440-02-0	Nickel	0.049	0.5	0.5	U
3050B	05/11/12	200.8	05/14/12	7440-22-4	Silver	0.0080	0.2	0.2	U
3050B	05/11/12	200.8	05/14/12	7440-66-6	Zinc	0.34	4	4	U

Reported in mg/kg (ppm).
U-Analyte undetected at given RL
RL-Reporting Limit

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc

UNITS: ug/L

SDG: UU16

ANALYTE	EL	M	RUN	ICVTV	ICV	%R	CCVTV	CCV1	%R	CCV2	%R	CCV3	%R	CCV4	%R	CCV5	%R
Antimony	SB	PMS	MS051481	50.0	48.76	**97.5**	50.0	49.37	**98.7**	49.68	**99.4**	49.60	**99.2**	49.97	**99.9**	49.70	**99.4**
Arsenic	AS	PMS	MS051481	50.0	49.40	**98.8**	50.0	50.48	**101.0**	50.35	**100.7**	50.91	**101.8**	50.55	**101.1**	50.69	**101.4**
Cadmium	CD	PMS	MS051481	50.0	48.45	**96.9**	50.0	49.41	**98.8**	50.16	**100.3**	50.83	**101.7**	50.52	**101.0**	50.11	**100.2**
Chromium	CR	PMS	MS051481	50.0	49.32	**98.6**	50.0	50.48	**101.0**	50.63	**101.3**	50.26	**100.5**	50.46	**100.9**	50.06	**100.1**
Copper	CU	PMS	MS051481	50.0	50.50	**101.0**	50.0	51.18	**102.4**	51.84	**103.7**	51.84	**103.7**	51.55	**103.1**	51.46	**102.9**
Lead	PB	PMS	MS051481	50.0	50.26	**100.5**	50.0	51.07	**102.1**	51.91	**103.8**	51.60	**103.2**	50.54	**101.1**	51.84	**103.7**
Mercury	HG	CVA	HG051402	8.0	8.22	**102.8**	4.0	4.11	**102.8**	4.17	**104.3**	4.18	**104.5**				
Nickel	NI	PMS	MS051481	50.0	49.97	**99.9**	50.0	51.19	**102.4**	51.39	**102.8**	51.78	**103.6**	51.43	**102.9**	51.45	**102.9**
Silver	AG	PMS	MS051481	50.0	49.71	**99.4**	50.0	51.05	**102.1**	50.63	**101.3**	51.33	**102.7**	51.26	**102.5**	50.85	**101.7**
Zinc	ZN	PMS	MS051481	50.0	49.11	**98.2**	50.0	50.74	**101.5**	51.05	**102.1**	50.99	**102.0**	51.68	**103.4**	51.47	**102.9**

Control Limits: Mercury 80-120; Other Metals 90-110

Calibration Verification

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc

SDG: UU16

UNITS: ug/L

ANALYTE	EL	M	RUN	CCVTV	CCV6	%R	CCV7	%R	CCV8	%R	CCV9	%R	CCV10	%R	CCV11	%R
Antimony	SB	PMS	MS051481	50.0	49.46	**98.9**	50.07	**100.1**	50.26	**100.5**	50.65	**101.3**	50.76	**101.5**	51.17	**102.3**
Arsenic	AS	PMS	MS051481	50.0	50.26	**100.5**	49.94	**99.9**	50.02	**100.0**	49.86	**99.7**	49.48	**99.0**	49.52	**99.0**
Cadmium	CD	PMS	MS051481	50.0	50.24	**100.5**	49.53	**99.1**	49.83	**99.7**	49.68	**99.4**	50.06	**100.1**	48.56	**97.1**
Chromium	CR	PMS	MS051481	50.0	51.07	**102.1**	50.12	**100.2**	50.38	**100.8**	48.27	**96.5**	48.46	**96.9**	46.47	**92.9**
Copper	CU	PMS	MS051481	50.0	51.57	**103.1**	50.94	**101.9**	51.45	**102.9**	50.96	**101.9**	50.87	**101.7**	50.56	**101.1**
Lead	PB	PMS	MS051481	50.0	51.95	**103.9**	51.73	**103.5**	51.05	**102.1**	50.84	**101.7**	50.48	**101.0**	50.18	**100.4**
Mercury	HG	CVA	HG051402	4.0												
Nickel	NI	PMS	MS051481	50.0	51.66	**103.3**	51.20	**102.4**	50.71	**101.4**	50.13	**100.3**	50.01	**100.0**	49.40	**98.8**
Silver	AG	PMS	MS051481	50.0	50.20	**100.4**	50.36	**100.7**	50.75	**101.5**	51.23	**102.5**	50.90	**101.8**	50.35	**100.7**
Zinc	ZN	PMS	MS051481	50.0	52.10	**104.2**	51.92	**103.8**	51.21	**102.4**	50.87	**101.7**	50.27	**100.5**	49.73	**99.5**

Control Limits: Mercury 80-120; Other Metals 90-110

CRDL Standard

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc

UNITS: ug/L

SDG: UU16

ANALYTE	EL	M	RUN	CRA/I	TV	CR-1	%R	CR-2	%R	CR-3	%R	CR-4	%R	CR-5	%R	CR-6	%R
Antimony	SB	PMS	MS051481		0.2	0.20	**100.0**										
Arsenic	AS	PMS	MS051481		0.2	0.28	**140.0**										
Cadmium	CD	PMS	MS051481		0.1	0.11	**110.0**										
Chromium	CR	PMS	MS051481		0.5	0.52	**104.0**										
Copper	CU	PMS	MS051481		0.5	0.59	**118.0**										
Lead	PB	PMS	MS051481		0.1	0.13	**130.0**										
Mercury	HG	CVA	HG051402		0.1	0.11	**110.0**										
Nickel	NI	PMS	MS051481		0.5	0.56	**112.0**										
Silver	AG	PMS	MS051481		0.2	0.19	**95.0**										
Zinc	ZN	PMS	MS051481		4.0	4.39	**109.8**										

UU16.06251

Control Limits: no control limits have been established by the EPA at this time.

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc

SDG: UU16

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	ICB	C	CCB1	C	CCB2	C	CCB3	C	CCB4	C	CCB5	C
Antimony	SB	PMS	MS051481	60.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Arsenic	AS	PMS	MS051481	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Cadmium	CD	PMS	MS051481	5.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Chromium	CR	PMS	MS051481	10.0	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Copper	CU	PMS	MS051481	25.0	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Lead	PB	PMS	MS051481	3.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Mercury	HG	CVA	HG051402	0.2	0.1	0.1	U	0.1	U	0.1	U	0.1	U				
Nickel	NI	PMS	MS051481	40.0	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Silver	AG	PMS	MS051481	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Zinc	ZN	PMS	MS051481	20.0	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U

Calibration Blanks

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc

SDG: UU16

UNITS: ug/L

ANALYTE	EL	METH	RUN	CRDL	IDL	CCB6	C	CCB7	C	CCB8	C	CCB9	C	CCB10	C	CCB11	C
Antimony	SB	PMS	MS051481	60.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Arsenic	AS	PMS	MS051481	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Cadmium	CD	PMS	MS051481	5.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Chromium	CR	PMS	MS051481	10.0	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Copper	CU	PMS	MS051481	25.0	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Lead	PB	PMS	MS051481	3.0	0.1	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Mercury	HG	CVA	HG051402	0.2	0.1												
Nickel	NI	PMS	MS051481	40.0	0.5	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U	0.5	U
Silver	AG	PMS	MS051481	10.0	0.2	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U	0.2	U
Zinc	ZN	PMS	MS051481	20.0	4.0	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U	4.0	U

ICP Interference Check Sample

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc

SDG: UU16

ICS SOURCE: I.V.

RUNID: MS051481

INSTRUMENT ID: PE ELAN 6000

UNITS: ug/L

ANALYTE	ICSA TV	ICSAB TV	ICSA1	ICSAB1	%R	ICSA2	ICSAB2	%R	ICSA3	ICSAB3	%R
Cadmium		20	0.0	19.8	**99.0**						
Chromium		20	0.7	19.9	**99.5**						
Cobalt		20	0.0	18.7	**93.5**						
Copper		20	0.6	20.5	**102.5**						
Manganese		20	0.1	19.0	**95.0**						
Molybdenum	400	400	417.3	406.3	**101.6**						
Nickel		20	0.7	19.9	**99.5**						
Selenium			-0.1	0.1							
Silver		20	0.0	19.6	**98.0**						
Thorium			0.2	0.1							
Vanadium			0.1	-0.2							
Zinc		20	1.6	20.0	**100.0**						

UU16 9625

Post Digest Spike Sample Recovery

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc

ANALYSIS METHOD: PMS

SDG: UU16

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	RUNID	SPIKED SAMPLE RESULT	C	SAMPLE RESULT	C	SPIKE ADDED	MATRIX	%R
Antimony	401A/DPA	UU16APOST	MS051481	509.04	B	4.00	U	500	Sediment	**101.8**

ICP Serial Dilutions

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc

ANALYSIS METHOD: PMS

SDG: UU16

UNITS: ug/L

ANALYTE	CLIENT ID	ARI ID	MATRIX	RUNID	INITIAL SAMPLE RESULT (I)	C	SERIAL DILUTION RESULT (S)	C	% DIFFERENCE	Q
Antimony	401A/DPL	UU16A-L	Sediment	MS051481	-0.02	U	-0.10	B		
Arsenic	401A/DPL	UU16A-L	Sediment	MS051481	2.21	B	2.70	B	22.2	
Cadmium	401A/DPL	UU16A-L	Sediment	MS051481	0.16	B	0.80	B	400.0	
Chromium	401A/DPL	UU16A-L	Sediment	MS051481	2.96	B	2.90	B	2.0	
Copper	401A/DPL	UU16A-L	Sediment	MS051481	21.36	B	23.95	B	12.1	
Lead	401A/DPL	UU16A-L	Sediment	MS051481	8.47		9.20	B	8.6	
Nickel	401A/DPL	UU16A-L	Sediment	MS051481	13.85	B	15.80	B	14.1	
Silver	401A/DPL	UU16A-L	Sediment	MS051481	0.17	U	0.20	B		
Zinc	401A/DPL	UU16A-L	Sediment	MS051481	62.20		68.10	B	9.5	

IDLs and ICP Linear Ranges

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc

SDG: UU16 UNITS: ug/L

ANALYTE	EL	METH	INSTRUMENT	WAVELENTH (nm)	GFA BACK-GROUND	CLP CRDL	RL	RL DATE	ICP LINEAR RANGE (ug/L)	ICP LR DATE
Antimony	SB	PMS	PE ELAN 6000 MS	0.00		60	0.2	4/1/2011		
Arsenic	AS	PMS	PE ELAN 6000 MS	0.00		10	0.2	4/1/2011		
Cadmium	CD	PMS	PE ELAN 6000 MS	0.00		5	0.1	4/1/2011		
Chromium	CR	PMS	PE ELAN 6000 MS	0.00		10	0.5	4/1/2011		
Copper	CU	PMS	PE ELAN 6000 MS	0.00		25	0.5	4/1/2011		
Lead	PB	PMS	PE ELAN 6000 MS	0.00		3	0.1	4/1/2011		
Mercury	HG	CVA	CETAC MERCURY	253.70		0.2	0.1	4/1/2011		
Nickel	NI	PMS	PE ELAN 6000 MS	0.00		40	0.5	4/1/2011		
Silver	AG	PMS	PE ELAN 6000 MS	0.00		10	0.2	4/1/2011		
Zinc	ZN	PMS	PE ELAN 6000 MS	0.00		20	4.0	4/1/2011		

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc

SDG: UU16

ANALYSIS METHOD: PMS

ARI PREP CODE: SWN

PREPDATE: 5/11/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
401A/DP	UU16A	1.035	0.0	50.0
401A/DPD	UU16ADUP	1.038	0.0	50.0
401A/DPS	UU16ASPK	1.037	0.0	50.0
401B/DP	UU16B	1.078	0.0	50.0
401C/DP	UU16C	1.067	0.0	50.0
401A/NSM	UU16D	1.053	0.0	50.0
401B/NSM	UU16E	1.048	0.0	50.0
401C/NSM	UU16F	1.087	0.0	50.0
410A/DP	UU16G	1.027	0.0	50.0
410B/DP	UU16H	1.059	0.0	50.0
410C/DP	UU16I	1.031	0.0	50.0
410A/NSM	UU16J	1.028	0.0	50.0
410B/NSM	UU16K	1.000	0.0	50.0
410C/NSM	UU16L	1.097	0.0	50.0
PBS	UU16MB1	1.000	0.0	50.0
LCSS	UU16MB1SPK	1.000	0.0	50.0

Preparation Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc

SDG: UU16

ANALYSIS METHOD: CVA

ARI PREP CODE: SMM

PREPDATE: 5/11/2012

CLIENT ID	ARI ID	MASS (g)	INITIAL VOLUME (mL)	FINAL VOLUME (mL)
401A/DP	UU16A	0.281	0.0	50.0
401A/DPD	UU16ADUP	0.282	0.0	50.0
401A/DPS	UU16ASPK	0.276	0.0	50.0
401B/DP	UU16B	0.245	0.0	50.0
401C/DP	UU16C	0.242	0.0	50.0
401A/NSM	UU16D	0.222	0.0	50.0
401B/NSM	UU16E	0.228	0.0	50.0
401C/NSM	UU16F	0.206	0.0	50.0
410A/DP	UU16G	0.261	0.0	50.0
410B/DP	UU16H	0.291	0.0	50.0
410C/DP	UU16I	0.291	0.0	50.0
410A/NSM	UU16J	0.249	0.0	50.0
410B/NSM	UU16K	0.206	0.0	50.0
410C/NSM	UU16L	0.246	0.0	50.0
PBS	UU16MB1	0.200	0.0	50.0
LCSW	UU16MB1SPK	0.200	0.0	50.0

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc   INSTRUMENT ID: PE ELAN 6000 MS   START DATE: 5/14/2012

SDG: UU16   RUNID: MS051481   METHOD: PMS   END DATE: 5/14/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
ZZZZZZ	ZZZZZZ	1.00	09160																														
ZZZZZZ	ZZZZZZ	1.00	09220																														
S0	S0	1.00	09290		X		X					X		X	X								X	X	X								X
S1	S1	1.00	09350		X		X					X		X	X								X	X	X								X
S2	S2	1.00	09410		X		X					X		X	X								X	X	X								X
S3	S3	1.00	09470		X		X					X		X	X								X	X	X								X
S4	S4	1.00	09530		X		X					X		X	X								X	X	X								X
ZZZZZZ	Rinse Sampl	1.00	10000																														
S0	S0	1.00	10090		X		X					X		X	X								X	X	X								X
ICV	MICV	1.00	10150		X		X					X		X	X								X	X	X								X
ICB	ICB	1.00	10220		X		X					X		X	X								X	X	X								X
CCV	MCCV1	1.00	10280		X		X					X		X	X								X	X	X								X
CCB	CCB1	1.00	10340		X		X					X		X	X								X	X	X								X
CRI	MCRI	1.00	10410		X		X					X		X	X								X	X	X								X
ICSA	ICSAI	1.00	10460		X		X					X		X	X								X	X	X								X
ICSAB	ICSABI	1.00	10530		X		X					X		X	X								X	X	X								X
ZZZZZZ	LR200	1.00	10590																														
ZZZZZZ	LR300	1.00	11060																														
ZZZZZZ	B1	1.00	11120																														
CCV	MCCV2	1.00	11190		X		X					X		X	X								X	X	X								X
CCB	CCB2	1.00	11250		X		X					X		X	X								X	X	X								X
ZZZZZZ	UU17MB	20.00	11320																														
PBS	UU16MB1	20.00	11380		X		X					X		X	X								X	X	X								X
ZZZZZZ	DI CHECK	1.00	11440																														
ZZZZZZ	ERAP197	10.00	11510																														
LCSS	UU16MB1SPK	20.00	11570		X		X					X		X	X								X	X	X								X
ZZZZZZ	UU17MBSPK	20.00	12030																														
ZZZZZZ	UU17A	500.00	12100																														
ZZZZZZ	UU17B	500.00	12160																														
ZZZZZZ	UU17C	500.00	12220																														
ZZZZZZ	UU17D	500.00	12290																														
CCV	MCCV3	1.00	12350		X		X					X		X	X								X	X	X								X
CCB	CCB3	1.00	12420		X		X					X		X	X								X	X	X								X
S0	S0	1.00	12470		X		X					X		X	X								X	X	X								X
CCV	MCCV4	1.00	12540		X		X					X		X	X								X	X	X								X

FORM XIV

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc | INSTRUMENT ID: PE ELAN 6000 MS | START DATE: 5/14/2012

SDG: UU16 | RUNID: MS051481 METHOD: PMS | END DATE: 5/14/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
CCB	CCB4	1.00	13000		X		X					X		X	X								X	X	X								X
ZZZZZZ	ZZZZZZ	100.00	13060																														
401A/DP	UU16A	20.00	13120																														
401A/DPD	UU16ADUP	20.00	13190		X		X					X			X								X	X	X								X
401A/DPS	UU16ASPK	20.00	13250		X		X					X			X								X	X	X								X
401A/DPA	UU16APOST	20.00	13310																						X								
401B/DP	UU16B	20.00	13370		X		X					X			X								X	X	X								X
401C/DP	UU16C	20.00	13440		X		X					X			X								X	X	X								X
401A/NSM	UU16D	20.00	13500		X		X					X			X								X	X	X								X
401B/NSM	UU16E	20.00	13560		X		X					X			X								X	X	X								X
401C/NSM	UU16F	20.00	14030		X		X					X			X								X	X	X								X
CCV	MCCV5	1.00	14090		X		X					X		X	X								X	X	X								X
CCB	CCB5	1.00	14160		X		X					X		X	X								X	X	X								X
S0	S0	1.00	14230		X		X					X		X	X								X	X	X								X
CCV	MCCV6	1.00	14290		X		X					X		X	X								X	X	X								X
CCB	CCB6	1.00	14360		X		X					X		X	X								X	X	X								X
410A/DP	UU16G	20.00	14410		X		X					X			X								X	X	X								X
410B/DP	UU16H	20.00	14480		X		X					X			X								X	X	X								X
410C/DP	UU16I	20.00	14540		X		X					X			X								X	X	X								X
410A/NSM	UU16J	20.00	15000		X		X					X			X								X	X	X								X
410B/NSM	UU16K	20.00	15070		X		X					X			X								X	X	X								X
410C/NSM	UU16L	20.00	15130		X		X					X			X								X	X	X								X
ZZZZZZ	UT17A	2.00	15190																														
ZZZZZZ	UT17B	2.00	15250																														
ZZZZZZ	UT17C	2.00	15320																														
ZZZZZZ	UT17D	2.00	15380																														
CCV	MCCV7	1.00	15440		X		X					X		X	X								X	X	X								X
CCB	CCB7	1.00	15510		X		X					X		X	X								X	X	X								X
S0	S0	1.00	15580		X		X					X		X	X								X	X	X								X
CCV	MCCV8	1.00	16060		X		X					X		X	X								X	X	X								X
CCB	CCB8	1.00	16120		X		X					X		X	X								X	X	X								X
401A/DPL	UU16A-L	500.00	16180											X																			
401A/DP	UU16A	100.00	16240											X																			
401A/DPD	UU16ADUP	100.00	16310											X																			
401A/DPS	UU16ASPK	100.00	16370											X																			

FORM XIV

UU16_0021

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc | INSTRUMENT ID: PE ELAN 6000 MS | START DATE: 5/14/2012

SDG: UU16 | RUNID: MS051481 METHOD: PMS | END DATE: 5/14/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
401A/DPL	UU16A-L	100.00	16430		X		X					X			X								X	X	X								X
401A/DP	UU16A	20.00	16500		X		X					X			X								X	X	X								X
401B/DP	UU16B	100.00	16560											X																			
401C/DP	UU16C	100.00	17020											X																			
401A/NSM	UU16D	100.00	17080											X																			
401B/NSM	UU16E	100.00	17150											X																			
CCV	MCCV9	1.00	17210		X		X					X		X	X								X	X	X								X
CCB	CCB9	1.00	17280		X		X					X		X	X								X	X	X								X
S0	S0	1.00	17330		X		X					X		X	X								X	X	X								X
CCV	MCCV10	1.00	17400		X		X					X		X	X								X	X	X								X
CCB	CCB10	1.00	17460		X		X					X		X	X								X	X	X								X
ZZZZZZ	UU11MB	2.00	17520																														
ZZZZZZ	UU11MBSPK	2.00	17580																														
ZZZZZZ	UU11A	2.00	18050																														
401C/NSM	UU16F	100.00	18110											X																			
410A/DP	UU16G	100.00	18170											X																			
410B/DP	UU16H	100.00	18240											X																			
410C/DP	UU16I	100.00	18300											X																			
410A/NSM	UU16J	100.00	18360											X																			
410B/NSM	UU16K	100.00	18420											X																			
410C/NSM	UU16L	100.00	18490											X																			
CCV	MCCV11	1.00	18550		X		X					X		X	X								X	X	X								X
CCB	CCB11	1.00	19020		X		X					X		X	X								X	X	X								X

Analysis Run Log

ANALYTICAL RESOURCES INCORPORATED

CLIENT: Hart Crowser

PROJECT: P.O.P. T4 Maintenanc | INSTRUMENT ID: CETAC MERCURY | START DATE: 5/14/2012

SDG: UU16 | RUNID: HG051402 | METHOD: CVA | END DATE: 5/14/2012

CLIENT ID	ARI ID	DIL.	TIME	%R	AG	AL	AS	B	BA	BE	CA	CD	CO	CR	CU	FE	HG	K	MG	MN	MO	NA	NI	PB	SB	SE	SI	SN	TI	TL	U	V	ZN
S0	S0	1.00	12462														X																
S0.1	S0.1	1.00	12480														X																
S0.5	S0.5	1.00	12493														X																
S1	S1	1.00	12511														X																
S2	S2	1.00	12525														X																
S5	S5	1.00	12542														X																
S10	S10	1.00	12560														X																
ICV	AICV	1.00	12581														X																
ICB	ICB	1.00	12595														X																
CCV	ACCV1	1.00	13012														X																
CCB	CCB1	1.00	13030														X																
CRA	CRA	1.00	13044														X																
PBW	UU16MB1	1.00	13062														X																
LCSW	UU16MB1SPK	1.00	13075														X																
401A/DP	UU16A	1.00	13093														X																
401A/DPD	UU16ADUP	1.00	13111														X																
401A/DPS	UU16ASPK	1.00	13124														X																
401B/DP	UU16B	1.00	13142														X																
401C/DP	UU16C	1.00	13160														X																
401A/NSM	UU16D	1.00	13173														X																
401B/NSM	UU16E	1.00	13191														X																
CCV	ACCV2	1.00	13205														X																
CCB	CCB2	1.00	13223														X																
401C/NSM	UU16F	1.00	13241														X																
410A/DP	UU16G	1.00	13255														X																
410B/DP	UU16H	1.00	13272														X																
410C/DP	UU16I	1.00	13290														X																
410A/NSM	UU16J	1.00	13303														X																
410B/NSM	UU16K	1.00	13321														X																
410C/NSM	UU16L	1.00	13335														X																
CCV	ACCV3	1.00	13352														X																
CCB	CCB3	1.00	13370														X																

UU16:0927_6

General Chemistry Analysis
Report and Summary QC Forms

ARI Job ID: UU16

SAMPLE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Client ID: 401A/DP
ARI ID: 12-8723 UU16A

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	54.00
Preserved Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	45.40
N-Ammonia	05/14/12 051412#1	EPA 350.1M	mg-N/kg	1.83	137
Sulfide	05/11/12 051112#1	EPA 376.2	mg/kg	2.18	10.9
Total Organic Carbon	05/15/12 051512#1	Plumb,1981	Percent	0.020	1.70

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Client ID: 401B/DP
ARI ID: 12-8724 UU16B

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/14/12 051412#1	SM2540B	Percent	0.01	65.40
Preserved Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	64.60
N-Ammonia	05/14/12 051412#1	EPA 350.1M	mg-N/kg	1.49	128
Sulfide	05/11/12 051112#1	EPA 376.2	mg/kg	1.33	9.36
Total Organic Carbon	05/15/12 051512#1	Plumb,1981	Percent	0.020	1.49

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Client ID: 401C/DP
ARI ID: 12-8725 UU16C

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	48.70
Preserved Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	51.40
N-Ammonia	05/14/12 051412#1	EPA 350.1M	mg-N/kg	4.31	229
Sulfide	05/11/12 051112#1	EPA 376.2	mg/kg	1.76	18.3
Total Organic Carbon	05/15/12 051512#1	Plumb,1981	Percent	0.020	1.80

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Client ID: 401A/NSM
ARI ID: 12-8726 UU16D

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	78.90
Preserved Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	71.80
N-Ammonia	05/14/12 051412#1	EPA 350.1M	mg-N/kg	0.60	28.0
Sulfide	05/11/12 051112#1	EPA 376.2	mg/kg	2.66	33.8
Total Organic Carbon	05/15/12 051512#1	Plumb,1981	Percent	0.020	1.36

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Client ID: 401B/NSM
ARI ID: 12-8727 UU16E

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	82.50
Preserved Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	79.50
N-Ammonia	05/14/12 051412#1	EPA 350.1M	mg-N/kg	0.24	16.0
Sulfide	05/11/12 051112#1	EPA 376.2	mg/kg	1.20	< 1.20 U
Total Organic Carbon	05/15/12 051512#1	Plumb,1981	Percent	0.020	0.116

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Client ID: 401C/NSM
ARI ID: 12-8728 UU16F

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	56.50
Preserved Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	52.00
N-Ammonia	05/14/12 051412#1	EPA 350.1M	mg-N/kg	3.43	293
Sulfide	05/11/12 051112#1	EPA 376.2	mg/kg	1.69	5.35
Total Organic Carbon	05/15/12 051512#1	Plumb,1981	Percent	0.020	1.68

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Client ID: 410A/DP
ARI ID: 12-8729 UU16G

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	55.30
Preserved Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	47.00
N-Ammonia	05/14/12 051412#1	EPA 350.1M	mg-N/kg	1.80	105
Sulfide	05/11/12 051112#1	EPA 376.2	mg/kg	2.00	28.6
Total Organic Carbon	05/15/12 051512#1	Plumb,1981	Percent	0.020	1.84

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Client ID: 410B/DP
ARI ID: 12-8730 UU16H

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	71.10
Preserved Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	65.40
N-Ammonia	05/14/12 051412#1	EPA 350.1M	mg-N/kg	1.41	81.9
Sulfide	05/11/12 051112#1	EPA 376.2	mg/kg	1.51	18.3
Total Organic Carbon	05/15/12 051512#1	Plumb,1981	Percent	0.020	1.18

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Client ID: 410C/DP
ARI ID: 12-8731 UU16I

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	65.50
Preserved Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	69.50
N-Ammonia	05/14/12 051412#1	EPA 350.1M	mg-N/kg	1.55	85.8
Sulfide	05/11/12 051112#1	EPA 376.2	mg/kg	13.1	94.2
Total Organic Carbon	05/15/12 051512#1	Plumb,1981	Percent	0.020	1.86

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Client ID: 410A/NSM
ARI ID: 12-8732 UU16J

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	60.60
Preserved Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	59.70
N-Ammonia	05/14/12 051412#1	EPA 350.1M	mg-N/kg	3.17	152
Sulfide	05/11/12 051112#1	EPA 376.2	mg/kg	1.58	22.4
Total Organic Carbon	05/15/12 051512#1	Plumb,1981	Percent	0.020	1.84

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Client ID: 410B/NSM
ARI ID: 12-8733 UU16K

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	72.70
Preserved Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	58.40
N-Ammonia	05/14/12 051412#1	EPA 350.1M	mg-N/kg	1.37	96.2
Sulfide	05/11/12 051112#1	EPA 376.2	mg/kg	1.65	32.9
Total Organic Carbon	05/15/12 051512#1	Plumb,1981	Percent	0.020	1.19

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/08/12
Date Received: 05/11/12

Client ID: 410C/NSM
ARI ID: 12-8734 UU16L

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	69.40
Preserved Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	68.60
N-Ammonia	05/14/12 051412#1	EPA 350.1M	mg-N/kg	2.76	140
Sulfide	05/11/12 051112#1	EPA 376.2	mg/kg	13.6	150
Total Organic Carbon	05/15/12 051512#1	Plumb,1981	Percent	0.020	1.39

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

SAMPLE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Client ID: Reference
ARI ID: 12-8735 UU16M

Analyte	Date	Method	Units	RL	Sample
Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	51.70
Preserved Total Solids	05/11/12 051112#1	SM2540B	Percent	0.01	52.40
N-Ammonia	05/14/12 051412#1	EPA 350.1M	mg-N/kg	0.95	29.9
Sulfide	05/11/12 051112#1	EPA 376.2	mg/kg	1.87	2.51

RL Analytical reporting limit
U Undetected at reported detection limit

Ammonia determined on 2N KCl extracts.

MS/MSD RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
ARI ID: UU16A Client ID: 401A/DP						
N-Ammonia	05/14/12	mg-N/kg	137	307	177	95.9%
Sulfide	05/11/12	mg/kg	10.9	346	329	101.9%
Total Organic Carbon	05/15/12	Percent	1.70	4.04	2.28	102.7%

REPLICATE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: 05/09/12
Date Received: 05/11/12

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: UU16A Client ID: 401A/DP					
Total Solids	05/11/12	Percent	54.00	54.00 54.30	0.3%
Preserved Total Solids	05/11/12	Percent	45.40	45.60	0.4%
N-Ammonia	05/14/12	mg-N/kg	137	138	0.7%
Sulfide	05/11/12	mg/kg	10.9	14.0	24.9%
Total Organic Carbon	05/15/12	Percent	1.70	1.70 1.23	17.6%

LAB CONTROL RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: NA
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Sulfide EPA 376.2	PREP	05/11/12	mg/kg	155	151	102.8%
Total Organic Carbon Plumb,1981	ICVL	05/15/12	Percent	0.098	0.100	98.0%

METHOD BLANK RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank
Total Solids	05/11/12	Percent	< 0.01 U
	05/14/12		< 0.01 U
Preserved Total Solids	05/11/12	Percent	< 0.01 U
N-Ammonia	05/14/12	mg-N/kg	< 0.10 U
Sulfide	05/11/12	mg/kg	< 1.00 U
Total Organic Carbon	05/15/12	Percent	< 0.020 U

STANDARD REFERENCE RESULTS-CONVENTIONALS
UU16-Hart Crowser

ANALYTICAL RESOURCES INCORPORATED

Matrix: Sediment
Data Release Authorized:
Reported: 05/16/12

Project: P.O.P. T4 Maintenance
Event: 15753-00
Date Sampled: NA
Date Received: NA

Analyte/SRM ID	Date	Units	SRM	True Value	Recovery
N-Ammonia ERA 160510	05/14/12	mg-N/kg	102	100	102.0%
Total Organic Carbon NIST 1941B	05/15/12	Percent	2.63	2.99	88.0%

Geotechnical Analysis
Report and Summary QC Forms

ARI Job ID: UU16

Hart Crowser
15753-00
P O P T4 Maintenance

Percent Finer (Passing) Than the Indicated Size

Sieve Size (microns)	3"	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4 (4750)	#10 (2000)	#20 (850)	#40 (425)	#60 (250)	#100 (150)	#200 (75)	32	22	13	9	7	3 2	1.3
401A/DP	100 0	100.0	100 0	100.0	100 0	100 0	100 0	100 0	99.8	98.7	90 0	78 4	74.2	65 1	44 1	36 4	28 0	23.8	17 9	10 7	6.0
	100.0	100.0	100.0	100.0	100 0	100.0	100 0	100 0	99 8	98.5	89 8	77 5	73.1	64 8	44 4	35 4	27 6	22 8	18 0	9 6	4.8
	100 0	100 0	100 0	100 0	100 0	100.0	100 0	99.8	99 4	98 1	89.2	77 5	73 1	63 2	43 9	35 0	27 3	21 4	17 2	9.5	4 2
401B/DP	100 0	100.0	100 0	100.0	100.0	100 0	100 0	100.0	99 9	98 6	81.3	56.0	49 3	43.2	31 6	23.7	18.1	14.7	11 3	4.5	2 8
401C/DP	100 0	100.0	100 0	100 0	100 0	100 0	100 0	100.0	100 0	99 7	99.3	99.1	98 3	90.8	60 3	47.4	34 4	28 0	21 5	10.8	5 7
401A/NSM	100.0	100 0	100.0	100 0	100.0	100 0	100 0	99 5	99.0	96.7	74 3	29 0	15 0	12.1	8.4	6 4	5.9	4.5	3.0	0 0	0 0
401B/NSM	100 0	100.0	100.0	100.0	100 0	100 0	100 0	100 0	100 0	98.9	64 0	14 4	4.1	3 0	0 0	0 0	0 0	0.0	0 0	0 0	0 0
401C/NSM	100 0	100.0	100 0	100.0	100 0	100 0	100.0	100.0	99 9	99 7	97.5	94 4	92 1	83.1	55 6	43.4	33 2	27.8	23 0	10 8	6.8
410A/DP	100 0	100 0	100 0	100.0	100.0	100.0	100 0	100.0	99 9	98 9	84 3	59 8	54.5	50.6	36 1	28.6	21 1	16.8	12 4	5 0	1 9
410B/DP	100 0	100 0	100 0	100 0	100 0	100 0	100 0	99 8	99.8	99 3	81 5	35.0	25.1	22 4	16.6	12 3	9.5	7 6	5.7	1.9	0 0
410C/DP	100.0	100 0	100.0	100.0	100.0	100 0	100.0	99 8	99 7	99 3	86.1	49 0	36 6	32 2	24.4	19 5	14.6	11 7	8.8	2.9	1 0
410A/NSM	100.0	100 0	100.0	100.0	100.0	99 6	99.2	99 2	99.0	98 4	87.5	64.3	57.3	50.4	35.6	29 7	20 2	15.4	10 7	3.6	0 0
410B/NSM	100 0	100.0	100 0	100.0	100 0	99.2	99 2	99 2	99 1	98.4	77 4	36.9	28 5	25.4	17.5	13.6	9 7	7.8	5.8	1 0	0.0
410C/NSM	100 0	100 0	100.0	100 0	100.0	100 0	100.0	99 9	99 8	99.3	84 2	51 2	42.6	39 6	31 2	24.9	17.6	13 6	9 6	2 3	0 0

Testing performed according to ASTM D421/D422

UU16

Hart Crowser
15753-00
P O P T4 Maintenance

Percent Retained in Each Size Fraction

Description	%Coarse Gravel				% Gravel			% Coarse Sand	% Medium Sand		% Fine Sand			% Very Coarse Silt	% Coarse Silt	% Medium Silt	% Fine Silt	% Fine Silt	% Very Fine Silt	% Clay	
Particle Size (microns)	3-2"	2-1 1/2"	1 1/2"-1"	1-3/4"	3/4-1/2"	1/2-3/8"	3/8"-4750	4750-2000	2000-850	850-425	425-250	250-150	150-75	75-32	32-22	22-13	13-9	9-7	7-3 2	3 2-1 3	<1 3
401A/DP	0.0	0 0	0 0	0 0	0 0	0 0	0 0	0 2	1.1	8 8	11.6	4.3	9.1	20 9	7 8	8 3	4.2	6 0	7 2	4 8	6 0
	0 0	0.0	0 0	0.0	0.0	0 0	0.0	0 2	1 2	8 7	12.3	4.4	8 3	20 3	9.0	7.8	4.8	4 8	8 4	4 8	4.8
	0 0	0 0	0 0	0 0	0 0	0 0	0.2	0.4	1.3	8.9	11.7	4 3	9.9	19 3	8.9	7.7	5 9	4.2	7 7	5.3	4.2
401B/DP	0 0	0 0	0 0	0 0	0.0	0.0	0 0	0 1	1.2	17 3	25 3	6 7	6 2	11 5	7 9	5 7	3 4	3.4	6 8	1 7	2.8
401C/DP	0 0	0 0	0.0	0 0	0.0	0.0	0.0	0 0	0 3	0.3	0 3	0 8	7 4	30.6	12 9	12.9	6 5	6 5	10 8	5 0	5.7
401A/NSM	0 0	0.0	0 0	0.0	0 0	0 0	0.5	0 4	2 3	22.4	45 3	14 0	2.9	3 7	2 0	0 5	1 5	1 5	3.0	0.0	0 0
401B/NSM	0 0	0.0	0.0	0.0	0 0	0 0	0.0	0.0	1 0	34.9	49 6	10 3	1.1	3 0	0.0	0 0	0.0	0 0	0.0	0.0	0.0
401C/NSM	0.0	0 0	0 0	0.0	0 0	0.0	0 0	0 1	0.2	2 2	3.1	2.3	9.1	27.5	12 2	10 2	5 4	4 7	12.2	4.1	6 8
410A/DP	0 0	0 0	0.0	0 0	0.0	0.0	0 0	0.1	1 0	14 6	24.5	5 3	3 8	14 6	7.5	7.5	4.4	4 4	7 5	3 1	1.9
410B/DP	0 0	0.0	0.0	0 0	0 0	0.0	0 2	0 0	0.5	17 8	46.5	9 8	2.8	5 8	4.3	2.8	1 9	1.9	3 8	1 9	0 0
410C/DP	0 0	0 0	0.0	0.0	0 0	0.0	0 2	0 1	0.4	13 3	37 1	12 4	4 4	7.8	4.9	4.9	2 9	2.9	5 8	1 9	1 0
410A/NSM	0.0	0 0	0.0	0 0	0 4	0 5	0 0	0 1	0 7	10 8	23 3	7 0	6 9	14 8	5 9	9 5	4 7	4.7	7 1	3 6	0 0
410B/NSM	0 0	0 0	0.0	0 0	0.8	0 0	0.0	0 0	0 8	21.0	40 5	8 4	3 1	7.9	3.9	3 9	1.9	1.9	4 9	1.0	0.0
410C/NSM	0 0	0.0	0 0	0 0	0.0	0 0	0 1	0.1	0 5	15 1	33 0	8 6	3.0	8 4	6 2	7 4	4 0	4 0	7.4	2 3	0.0

UU16

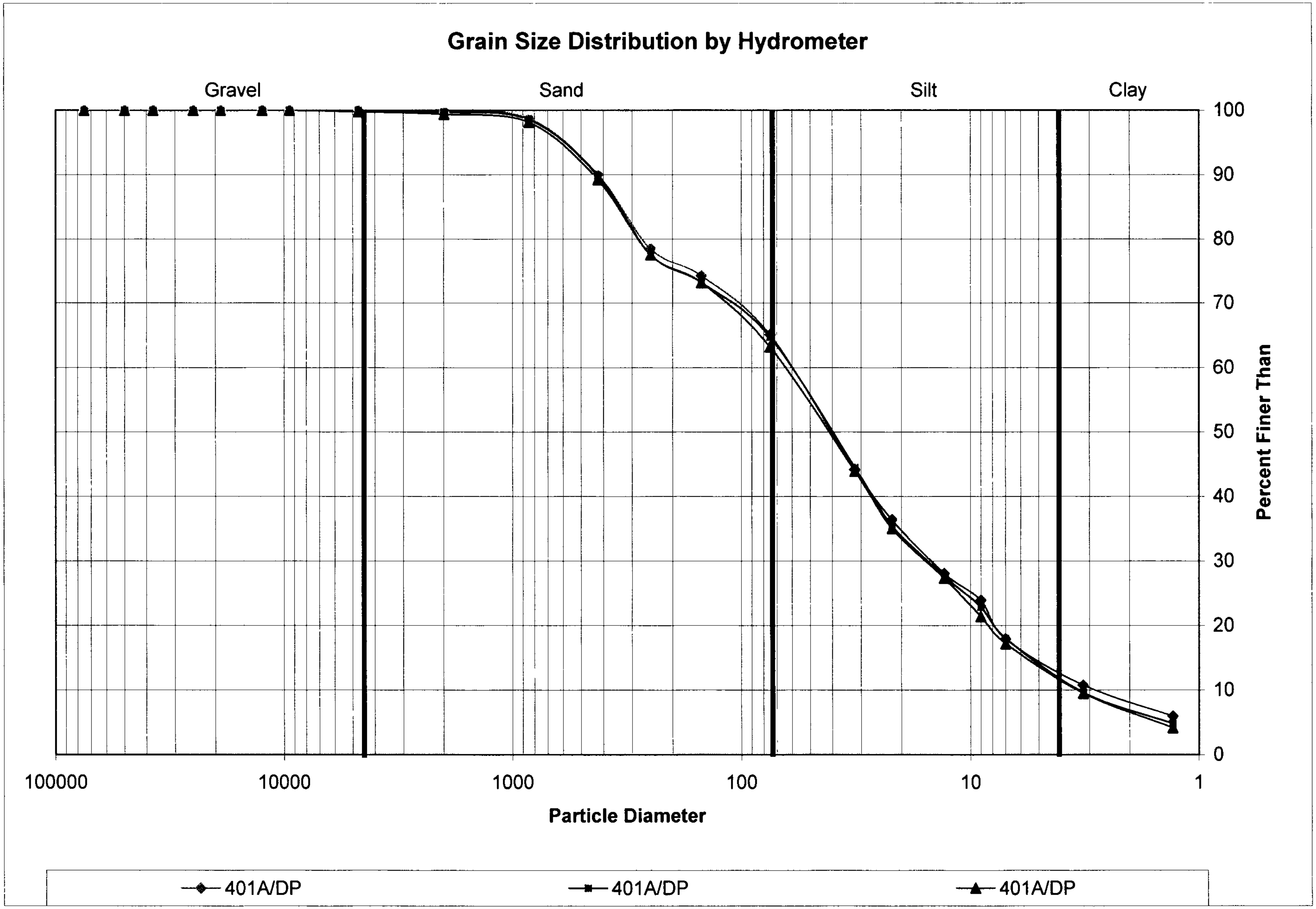
Client	Hart Crowser	Project No	15753-00
		Project	P O P T4 Maintenance
ARI Triplicate Sample ID	UU16A	Batch No	UU16-01
Client Triplicate Sample ID	401A/DP	Page	1 of 1

Relative Standard Deviation, By Size

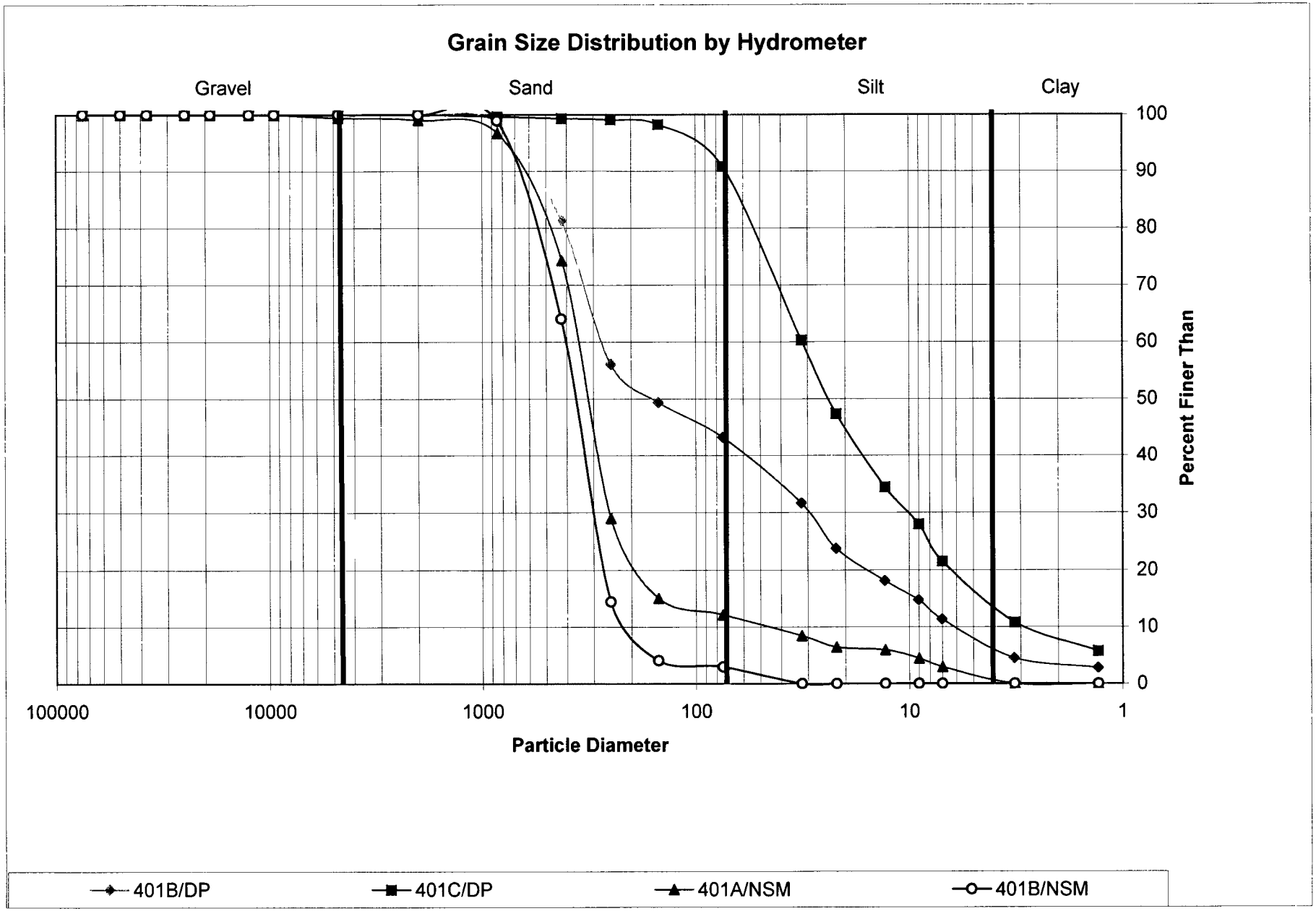
Sample ID	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	32	22	13	9	7	3 2	1 3
401A/DP	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	99 8	98 7	90 0	78 4	74 2	65 1	44 1	36 4	28 0	23 8	17 9	10 7	6 0
401A/DP	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0	99 8	98 5	89 8	77 5	73 1	64 8	44 4	35 4	27 6	22 8	18 0	9 6	4 8
401A/DP	100 0	100 0	100 0	100 0	100 0	100 0	100 0	99 8	99 4	98 1	89 2	77 5	73 1	63 2	43 9	35 0	27 3	21 4	17 2	9 5	4 2
AVE	100 00	100 00	100 00	100 00	100 00	100 00	100 00	99 93	99 66	98 46	89 67	77 80	73 48	64 35	44 15	35 60	27 64	22 67	17 70	9 94	4 97
STDEV	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 13	0 26	0 32	0 41	0 55	0 61	0 98	0 27	0 70	0 37	1 25	0 44	0 68	0 92
%RSD	0 00	0 00	0 00	0 00	0 00	0 00	0 00	0 13	0 26	0 33	0 46	0 71	0 83	1 53	0 62	1 97	1 33	5 53	2 47	6 89	18 43

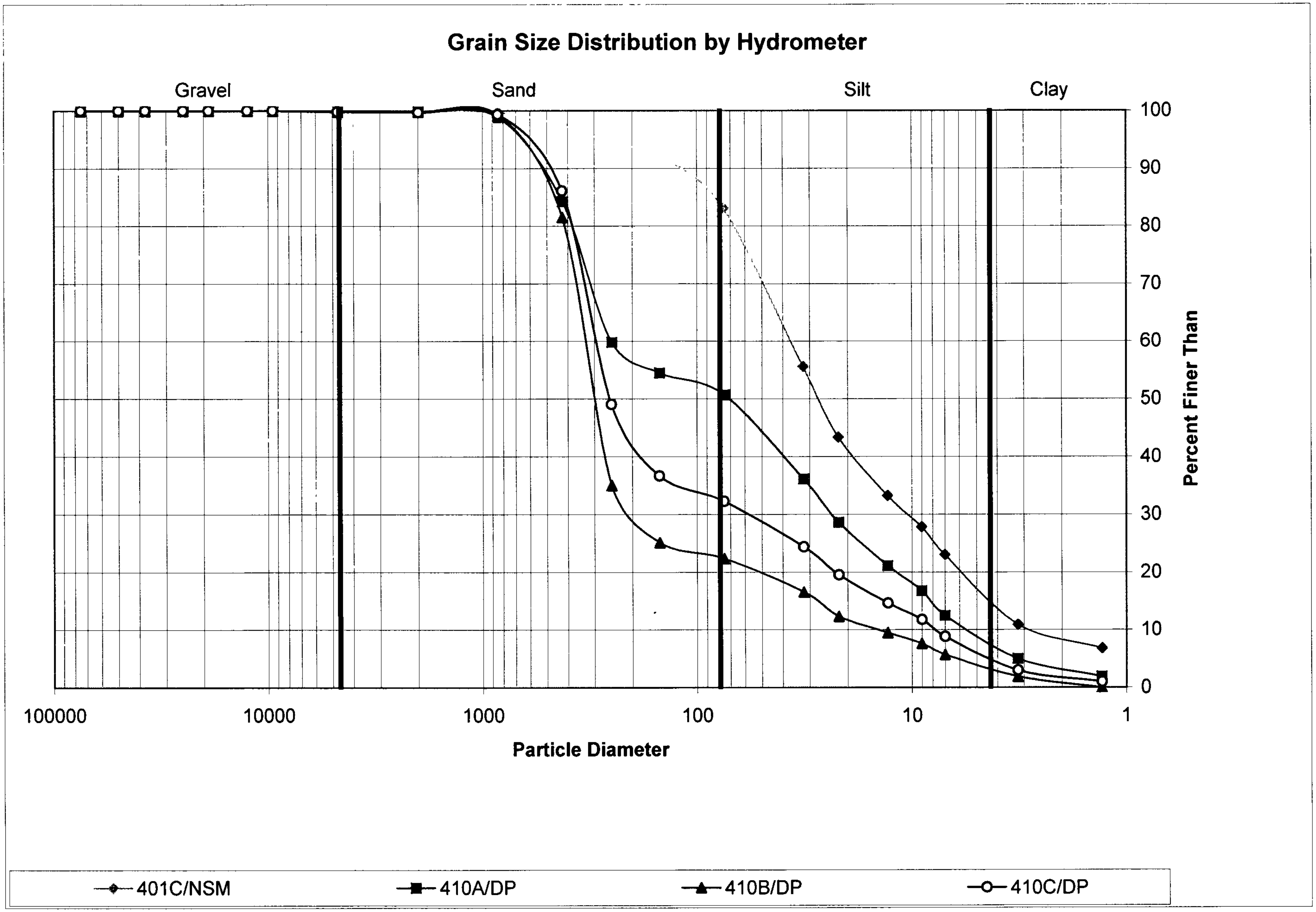
This Triplicate applies to the Batch Containing the Following Samples

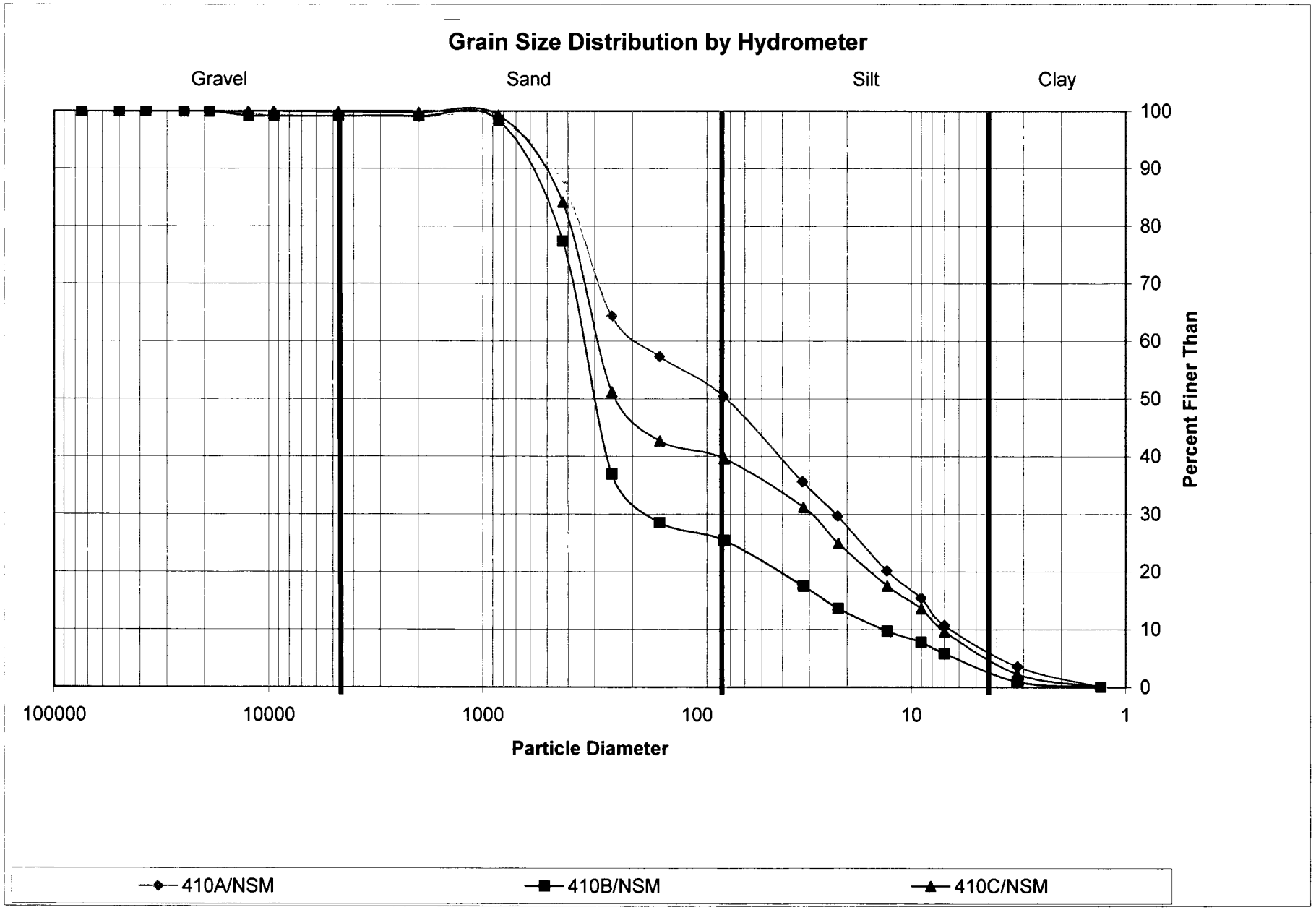
Sample ID	Date Sampled	Date Set up	Date Started	Date Complete	Data Qualifiers
401A/DP	5/9/2012	5/11/2012	5/14/2012	5/16/2012	
	5/9/2012	5/11/2012	5/14/2012	5/16/2012	
	5/9/2012	5/11/2012	5/14/2012	5/16/2012	
401B/DP	5/8/2012	5/11/2012	5/14/2012	5/16/2012	
401C/DP	5/9/2012	5/11/2012	5/14/2012	5/16/2012	
401A/NSM	5/9/2012	5/11/2012	5/14/2012	5/16/2012	
401B/NSM	5/8/2012	5/11/2012	5/14/2012	5/16/2012	
401C/NSM	5/9/2012	5/11/2012	5/14/2012	5/16/2012	
410A/DP	5/8/2012	5/11/2012	5/14/2012	5/16/2012	
410B/DP	5/8/2012	5/11/2012	5/14/2012	5/16/2012	
410C/DP	5/8/2012	5/11/2012	5/14/2012	5/16/2012	
410A/NSM	5/8/2012	5/11/2012	5/14/2012	5/16/2012	
410B/NSM	5/8/2012	5/11/2012	5/14/2012	5/16/2012	
410C/NSM	5/8/2012	5/11/2012	5/14/2012	5/16/2012	



Grain Size Distribution by Hydrometer
Gravel
Sand
Silt
Clay
100
90
80
70
60
50
40
30
20
10
0
Percent Finer Than
100000
10000
1000
100
10
1
Particle Diameter
401A/DP
401A/DP
401A/DP


Grain Size Distribution by Hydrometer
Gravel
Sand
Silt
Clay
100
90
80
70
60
50
40
30
20
10
0
Percent Finer Than
100000
10000
1000
100
10
1
Particle Diameter
401B/DP
401C/DP
401A/NSM
401B/NSM


Grain Size Distribution by Hydrometer
Gravel
Sand
Silt
Clay
100
90
80
70
60
50
40
30
20
10
0
Percent Finer Than
100000
10000
1000
100
10
1
Particle Diameter
401C/NSM
410A/DP
410B/DP
410C/DP


Grain Size Distribution by Hydrometer
Gravel
Sand
Silt
Clay
100
90
80
70
60
50
40
30
20
10
0
Percent Finer Than
100000
10000
1000
100
10
1
Particle Diameter
410A/NSM
410B/NSM
410C/NSM

100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	99 85	98 74	89 99	78 44	74 18	65 07	44 12	36 37	28 02	23 85
125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	28 1	18 8	11 4	8 3
5"	3"	2"	1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200				

17 89	10 73
6 1	3 1

5 96	
1 3	

Sample Number	401A/DP	
Test Temperature		22
Specific Gravity		2.65

Wet Wt & Tare	18.06
Dry Wt & Tare	17.53
Wt Moisture	0 53
Wt Tare	1.53
Dry Soil	16
Moisture Content	0 033125
Air Dry Total Sample	129 33
Oven Dry Total Samp	125 189395
Air Dry Hydro Sample	86.63
Oven Dry Wt Hydro	83 85238959
Amount Plus #10	0 19
W (14 2) =	83 97984584

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5"	10.01	0 00		0 00	100 00
3"	10.01	0 00		0 00	100 00
2"	10.01	0 00		0 00	100 00
1 5"	10.01	0 00		0 00	100 00
1	10.01	0 00		0 00	100 00
3/4	10.01	0 00		0 00	100 00
1/2	10.01	0 00		0 00	100 00
3/8	10 01	0 00		0 00	100 00
4	10.01	0 00		0 00	100 00
10	10.2	0 19		0 15	99 85
20	11.13	0 93	1 11	1 26	98 74
40	18.48	8 28	9 86	10 01	89 99
60	28.18	17 98	21 41	21 56	78 44
100	31.76	21 56	25 67	25 82	74 18
200	39.41	29 21	34 78	34 93	65 07

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	50	8.0	50 08	8 1	37 8195	0 013286	1 001385
2	45	8 0	44 12	8 9	28 06216	0 013286	1 001385
5	38.5	8.0	36 37	10 0	18 77776	0 013286	1 001385
15	31.5	8.0	28 02	11 1	11 44709	0 013286	1 001385
30	28	8.0	23 85	11 7	8 300198	0 013286	1 001385
60	23	8.0	17 89	12 5	6 071043	0 013286	1 001385
250	18	9.0	10 73	13 3	3 069925	0 013286	1 001385
1440	14	9.0	5 96	14 0	1 310172	0 013286	1 001385

Sample Number	401A/DP		100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	99 76	98 54	89 81	77 49	73 11	64 77	44 44	35 43	27 62	22 82	18 01	9 61	4 80
			125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	28 1	18 9	11 5	8 4	6 1	3 1	1 3
Test Temperature		22 5"	3"	2"		1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity		2.65																						

Wet Wt & Tare	22.02
Dry Wt & Tare	21.33
Wt Moisture	0 69
Wt Tare	1.53
Dry Soil	19 8
Moisture Content	0 034848485
Air Dry Total Sample	126.35
Oven Dry Total Samp	122 1049341
Air Dry Hydro Sample	86.08
Oven Dry Wt Hydro	83 18125915
Amount Plus #10	0 29
W (14 2) =	83 37928549

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5"	10.41	0 00		0 00	100 00
3"	10.41	0 00		0 00	100 00
2"	10.41	0 00		0 00	100 00
1 5"	10.41	0 00		0 00	100 00
1	10.41	0 00		0 00	100 00
3/4	10.41	0 00		0 00	100 00
1/2	10.41	0 00		0 00	100 00
3/8	10.41	0 00		0 00	100 00
4	10.41	0 00		0 00	100 00
10	10.7	0 29		0 24	99 76
20	11.72	1 02	1 22	1 46	98 54
40	19	8 30	9 95	10 19	89 81
60	29.27	18 57	22 27	22 51	77 49
100	32.92	22 22	26 65	26 89	73 11
200	39.88	29 18	35 00	35 23	64 77

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	51.5	8	52 24	7 9	37 24135	0 013286	1 001385
2	45	8	44 44	8 9	28 06216	0 013286	1 001385
5	37.5	8	35 43	10 2	18 93121	0 013286	1 001385
15	31	8	27 62	11 2	11 48914	0 013286	1 001385
30	27	8	22 82	11 9	8 358089	0 013286	1 001385
60	23	8	18 01	12 5	6 071043	0 013286	1 001385
250	17	9	9 61	13 5	3 088715	0 013286	1 001385
1440	13	9	4 80	14 2	1 317817	0 013286	1 001385

Sample Number	401A/DP	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	99 78	99 37	98 11	89 20	77 49	73 14	63 23	43 90	35 00	27 29	21 36	17 20	9 49	4 15
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	28 1	18 9	11 5	8 4	6 1	3 1	1 3
Test Temperature	22	5"	3"	2"	1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2 65																						

Wet Wt & Tare	20 53
Dry Wt & Tare	19.9
Wt Moisture	0 63
Wt Tare	1.54
Dry Soil	18 36
Moisture Content	0 034313725
Air Dry Total Sample	129.19
Oven Dry Total Samp	124 9302844
Air Dry Hydro Sample	86.75
Oven Dry Wt Hydro	83 87203791
Amount Plus #10	0 79
W (14 2) =	84 40578013

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5"	10.23	0 00		0 00	100 00
3"	10.23	0 00		0 00	100 00
2"	10.23	0 00		0 00	100 00
1 1/2"	10.23	0 00		0 00	100 00
1	10.23	0 00		0 00	100 00
3/4	10.23	0 00		0 00	100 00
1/2	10.23	0 00		0 00	100 00
3/8	10.23	0 00		0 00	100 00
4	10.51	0 28		0 22	99 78
10	11.02	0 79		0 63	99 37
20	12.08	1 06	1 26	1 89	98 11
40	19.6	8 58	10 17	10 80	89 20
60	29.49	18 47	21 88	22 51	77 49
100	33.16	22 14	26 23	26 86	73 14
200	41.52	30 50	36 13	36 77	63 23

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	51	8	51 01	7 9	37 43506	0 013286	1 001385
2	45	8	43 90	8 9	28 06216	0 013286	1 001385
5	37.5	8	35 00	10 2	18 93121	0 013286	1 001385
15	31	8	27 29	11 2	11 48914	0 013286	1 001385
30	26	8	21 36	12 0	8 415582	0 013286	1 001385
60	22.5	8	17 20	12 6	6 090867	0 013286	1 001385
250	17	9	9 49	13 5	3 088715	0 013286	1 001385
1440	12.5	9	4 15	14 2	1 321623	0 013286	1 001385

Sample Number	401B/DP	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	99 85	98 62	81 34	56 05	49 33	43 18	31 65	23 73	18 08	14 69	11 30	4 52	2 83
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	30 3	20 2	12 1	8 7	6 3	3 2	1 3
Test Temperature	22 5"	3"	2"		1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2.65																						

Wet Wt & Tare	22 87
Dry Wt & Tare	22 3
Wt Moisture	0 57
Wt Tare	1.54
Dry Soil	20 76
Moisture Content	0 027456647
Air Dry Total Sample	173.25
Oven Dry Total Samp	168 6269339
Air Dry Hydro Sample	90.9
Oven Dry Wt Hydro	88 47088608
Amount Plus #10	0 25
W (14 2) =	88 60224446

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5"	10.55	0 00		0 00	100 00
3"	10.55	0 00		0 00	100 00
2"	10.55	0 00		0 00	100 00
1 5"	10 55	0 00		0 00	100 00
1	10.55	0 00		0 00	100 00
3/4	10.55	0 00		0 00	100 00
1/2	10.55	0 00		0 00	100 00
3/8	10.55	0 00		0 00	100 00
4	10.55	0 00		0 00	100 00
10	10.8	0 25		0 15	99 85
20	11.89	1 09	1 23	1 38	98 62
40	27 2	16 40	18 51	18 66	81 34
60	49.61	38 81	43 80	43 95	56 05
100	55.56	44 76	50 52	50 67	49 33
200	61.01	50 21	56 67	56 82	43 18

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	39	8	35 04	9 9	41 81575	0 013286	1 001385
2	36	8	31 65	10 4	30 29315	0 013286	1 001385
5	29	8	23 73	11 5	20 18845	0 013286	1 001385
15	24	8	18 08	12 4	12 0624	0 013286	1 001385
30	21	8	14 69	12 9	8 697348	0 013286	1 001385
60	18	8	11 30	13 3	6 266457	0 013286	1 001385
250	13	9	4 52	14 2	3 162761	0 013286	1 001385
1440	11.5	9	2 83	14 4	1 329202	0 013286	1 001385

Sample Number	401C/DP	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	99 66	99 34	99 08	98 27	90 83	60 27	47 36	34 44	27 98	21 53	10 76	5 74
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	26 7	18 4	11 4	8 3	6 1	3 1	1 3
Test Temperature	22 5"	3"	2"		1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2.65																						

Wet Wt & Tare	19.3
Dry Wt & Tare	18.58
Wt Moisture	0 72
Wt Tare	1.54
Dry Soil	17 04
Moisture Content	0 042253521
Air Dry Total Sample	119.77
Oven Dry Total Samp	114 9144595
Air Dry Hydro Sample	72.73
Oven Dry Wt Hydro	69 78148649
Amount Plus #10	0 00
W (14 2) =	69 78148649

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5"	10.28	0 00		0 00	100 00
3"	10 28	0 00		0 00	100 00
2"	10.28	0 00		0 00	100 00
1 5"	10.28	0 00		0 00	100 00
1	10.28	0 00		0 00	100 00
3/4	10 28	0 00		0 00	100 00
1/2	10 28	0 00		0 00	100 00
3/8	10.28	0 00		0 00	100 00
4	10.28	0 00		0 00	100 00
10	10.28	0 00		0 00	100 00
20	10.52	0 24	0 34	0 34	99 66
40	10.74	0 46	0 66	0 66	99 34
60	10.92	0 64	0 92	0 92	99 08
100	11.49	1 21	1 73	1 73	98 27
200	16.68	6 40	9 17	9 17	90 83

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	56	8	68 88	7 1	35 45036	0 013286	1 001385
2	50	8	60 27	8 1	26 74243	0 013286	1 001385
5	41	8	47 36	9 6	18 38855	0 013286	1 001385
15	32	8	34 44	11 1	11 40489	0 013286	1 001385
30	27.5	8	27 98	11 8	8 329194	0 013286	1 001385
60	23	8	21 53	12 5	6 071043	0 013286	1 001385
250	16.5	9	10 76	13 6	3 098068	0 013286	1 001385
1440	13	9	5 74	14 2	1 317817	0 013286	1 001385

Sample Number	401A/NSM	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	99 45	99 03	96 74	74 32	29 03	15 02	12 15	8 41	6 43	5 94	4 45	2 97	0 00	0 00
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	34 6	22 2	12 8	9 2	6 5	3 2	1 3
Test Temperature	22	5"	3"	2"	1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2.65																						

Wet Wt & Tare	**22.27**
Dry Wt & Tare	**21.93**
Wt Moisture	0 34
Wt Tare	**1.54**
Dry Soil	20 39
Moisture Content	0 016674841
Air Dry Total Sample	**197 11**
Oven Dry Total Samp	193 9079643
Air Dry Hydro Sample	**101.87**
Oven Dry Wt Hydro	100 1991944
Amount Plus #10	1 88
W (14 2) =	101 1801686

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5"	**10 09**	0 00		0 00	100 00
3"	**10.09**	0 00		0 00	100 00
2"	**10.09**	0 00		0 00	100 00
1 5"	**10.09**	0 00		0 00	100 00
1	**10.09**	0 00		0 00	100 00
3/4	**10 09**	0 00		0 00	100 00
1/2	**10.09**	0 00		0 00	100 00
3/8	**10 09**	0 00		0 00	100 00
4	**11.15**	1 06		0 55	99 45
10	**11.97**	1 88		0 97	99 03
20	**14.29**	2 32	2 29	3 26	96 74
40	**36.97**	25 00	24 71	25 68	74 32
60	**82.8**	70 83	70 00	70 97	29 03
100	**96.97**	85 00	84 01	84 98	15 02
200	**99.88**	87 91	86 88	87 85	12 15

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	**18**	**8**	9 90	13 3	48 53977	0 013286	1 001385
2	**16.5**	**8**	8 41	13 6	34 63745	0 013286	1 001385
5	**14.5**	**8**	6 43	13 9	22 1692	0 013286	1 001385
15	**14**	**8**	5 94	14 0	12 83701	0 013286	1 001385
30	**12.5**	**8**	4 45	14 2	9 156474	0 013286	1 001385
60	**11**	**8**	2 97	14 5	6 530221	0 013286	1 001385
250	**9**	**9**	0 00	14 8	3 235113	0 013286	1 001385
1440	**9**	**9**	0 00	14 8	1 347964	0 013286	1 001385

Sample Number	401B/NSM	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	99 97	98 92	64 01	14 40	4 10	2 99	0 00	0 00	0 00	0 00	0 00	0 00	0 00
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	36 4	23 0	13 3	9 4	6 6	3 3	1 4
Test Temperature	22 5"	3"	2"		1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2 65																						

Wet Wt & Tare	27.79
Dry Wt & Tare	27.49
Wt Moisture	0 3
Wt Tare	1.55
Dry Soil	25 94
Moisture Content	0 01156515
Air Dry Total Sample	208.56
Oven Dry Total Samp	206 1762348
Air Dry Hydro Sample	104 08
Oven Dry Wt Hydro	102 890061
Amount Plus #10	0 06
W (14 2) =	102 9200121

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5	10.36	0 00		0 00	100 00
3	10.36	0 00		0 00	100 00
2	10.36	0 00		0 00	100 00
1 5	10.36	0 00		0 00	100 00
1	10.36	0 00		0 00	100 00
3/4	10.36	0 00		0 00	100 00
1/2	10.36	0 00		0 00	100 00
3/8	10.36	0 00		0 00	100 00
4	10.36	0 00		0 00	100 00
10	10.42	0 06		0 03	99 97
20	11.5	1 08	1 05	1 08	98 92
40	47 43	37 01	35 96	35 99	64 01
60	98.49	88 07	85 57	85 60	14 40
100	109.09	98 67	95 87	95 90	4 10
200	110 23	99 81	96 98	97 01	2 99

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	8	8	0 00	15 0	51 43365	0 013286	1 001385
2	8	8	0 00	15 0	36 36908	0 013286	1 001385
5	8	8	0 00	15 0	23 00183	0 013286	1 001385
15	8	8	0 00	15 0	13 28011	0 013286	1 001385
30	8	8	0 00	15 0	9 390457	0 013286	1 001385
60	8	8	0 00	15 0	6 640055	0 013286	1 001385
250	8	8	0 00	15 0	3 25295	0 013286	1 001385
1440	8	8	0 00	15 0	1 355396	0 013286	1 001385

Sample Number	401C/NSM	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	99 93	99 70	97 55	94 43	92 12	83 06	55 55	43 36	33 20	27 78	23 03	10 84	6 77
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	27 0	18 5	11 4	8 3	6 0	3 1	1 3
Test Temperature	22	5"	3"	2"	1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2.65																						

Wet Wt & Tare	18.22
Dry Wt & Tare	17.62
Wt Moisture	0 6
Wt Tare	1.55
Dry Soil	16 07
Moisture Content	0 037336652
Air Dry Total Sample	115.57
Oven Dry Total Samp	111 4131914
Air Dry Hydro Sample	76.61
Oven Dry Wt Hydro	73 85259148
Amount Plus #10	0 08
W (14 2) =	73 90565928

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5	10.27	0 00		0 00	100 00
3	10.27	0 00		0 00	100 00
2	10.27	0 00		0 00	100 00
1 5	10.27	0 00		0 00	100 00
1	10.27	0 00		0 00	100 00
3/4	10.27	0 00		0 00	100 00
1/2	10.27	0 00		0 00	100 00
3/8	10.27	0 00		0 00	100 00
4	10.27	0 00		0 00	100 00
10	10.35	0 08		0 07	99 93
20	10.52	0 17	0 23	0 30	99 70
40	12 11	1 76	2 38	2 45	97 55
60	14.41	4 06	5 49	5 57	94 43
100	16.12	5 77	7 81	7 88	92 12
200	22.82	12 47	16 87	16 94	83 06

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	55	8	63 68	7 3	35 85609	0 013286	1 001385
2	49	8	55 55	8 3	27 01153	0 013286	1 001385
5	40	8	43 36	9 7	18 54522	0 013286	1 001385
15	32.5	8	33 20	11 0	11 36254	0 013286	1 001385
30	28.5	8	27 78	11 6	8 2711	0 013286	1 001385
60	25	8	23 03	12 2	5 991093	0 013286	1 001385
250	17	9	10 84	13 5	3 088715	0 013286	1 001385
1440	14	9	6 77	14 0	1 310172	0 013286	1 001385

Sample Number	410A/DP																						
		100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	99 88	98 85	84 25	59 78	54 46	50 65	36 08	28 61	21 15	16 79	12 44	4 98	1 87
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	30 1	19 9	12 0	8 7	6 3	3 2	1 3
Test Temperature	22	5"	3"	2"	1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2.65																						

Wet Wt & Tare	18.2
Dry Wt & Tare	17.7
Wt Moisture	0 5
Wt Tare	1 57
Dry Soil	16 13
Moisture Content	0 03099814
Air Dry Total Sample	140.16
Oven Dry Total Samp	135 9507396
Air Dry Hydro Sample	82 89
Oven Dry Wt Hydro	80 3978172
Amount Plus #10	0 16
W (14 2) =	80 49254863

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5	9.75	0 00		0 00	100 00
3	9.75	0 00		0 00	100 00
2	9.75	0 00		0 00	100 00
1 5	9 75	0 00		0 00	100 00
1	9 75	0 00		0 00	100 00
3/4	9.75	0 00		0 00	100 00
1/2	9.75	0 00		0 00	100 00
3/8	9 75	0 00		0 00	100 00
4	9.75	0 00		0 00	100 00
10	9.91	0 16		0 12	99 88
20	10.74	0 83	1 03	1 15	98 85
40	22.49	12 58	15 63	15 75	84 25
60	42.19	32 28	40 10	40 22	59 78
100	46.47	36 56	45 42	45 54	54 46
200	49.54	39 63	49 23	49 35	50 65

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	41	8	41 05	9 6	41 11805	0 013286	1 001385
2	37	8	36 08	10 2	30 05344	0 013286	1 001385
5	31	8	28 61	11 2	19 89978	0 013286	1 001385
15	25	8	21 15	12 2	11 98219	0 013286	1 001385
30	21.5	8	16 79	12 8	8 669584	0 013286	1 001385
60	18	8	12 44	13 3	6 266457	0 013286	1 001385
250	13	9	4 98	14 2	3 162761	0 013286	1 001385
1440	10.5	9	1 87	14 6	1 336738	0 013286	1 001385

Sample Number	410B/DP	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	99 81	99 79	99 29	81 45	34 97	25 14	22 37	16 56	12 31	9 47	7 57	5 68	1 89	0 00
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	32 7	21 3	12 5	9 0	6 4	3 2	1 3
Test Temperature	22	5"	3"	2"	1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2.65																						

Wet Wt & Tare	21.82
Dry Wt & Tare	21.37
Wt Moisture	0 45
Wt Tare	1.57
Dry Soil	19 8
Moisture Content	0 022727273
Air Dry Total Sample	181.56
Oven Dry Total Samp	177 5335556
Air Dry Hydro Sample	107.97
Oven Dry Wt Hydro	105 5706667
Amount Plus #10	0 37
W (14 2) =	105 7911474

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5	10 89	0 00		0 00	100 00
3	10 89	0 00		0 00	100 00
2	10.89	0 00		0 00	100 00
1 5	10.89	0 00		0 00	100 00
1	10.89	0 00		0 00	100 00
3/4	10.89	0 00		0 00	100 00
1/2	10.89	0 00		0 00	100 00
3/8	10.89	0 00		0 00	100 00
4	11.22	0 33		0 19	99 81
10	11.26	0 37		0 21	99 79
20	11.79	0 53	0 50	0 71	99 29
40	30.66	19 40	18 34	18 55	81 45
60	79.84	68 58	64 83	65 03	34 97
100	90.24	78 98	74 66	74 86	25 14
200	93.16	81 90	77 42	77 63	22 37

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	27	8	17 98	11 9	45 77914	0 013286	1 001385
2	25.5	8	16 56	12 1	32 70418	0 013286	1 001385
5	21	8	12 31	12 9	21 30407	0 013286	1 001385
15	18	8	9 47	13 3	12 53291	0 013286	1 001385
30	16	8	7 57	13 7	8 970269	0 013286	1 001385
60	14	8	5 68	14 0	6 418507	0 013286	1 001385
250	11	9	1 89	14 5	3 199142	0 013286	1 001385
1440	9	9	0 00	14 8	1 347964	0 013286	1 001385

Sample Number	410C/DP		100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	99 83	99 71	99 34	86 08	49 01	36 60	32 19	24 37	19 50	14 62	11 70	8 77	2 92	0 97
			125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	31 0	20 3	12 1	8 8	6 3	3 1	1 3
Test Temperature		22 5"	3"	2"		1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity		2.65																					

Wet Wt & Tare	21.09
Dry Wt & Tare	20.55
Wt Moisture	0 54
Wt Tare	1.57
Dry Soil	18 98
Moisture Content	0 028451001
Air Dry Total Sample	147.23
Oven Dry Total Samp	143 1683811
Air Dry Hydro Sample	105.35
Oven Dry Wt Hydro	102 4356045
Amount Plus #10	0 41
W (14 2) =	102 7297981

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5"	10.6	0 00		0 00	100 00
3"	10.6	0 00		0 00	100 00
2"	10.6	0 00		0 00	100 00
1 5"	10.6	0 00		0 00	100 00
1"	10.6	0 00		0 00	100 00
3/4"	10 6	0 00		0 00	100 00
1/2"	10.6	0 00		0 00	100 00
3/8"	10.6	0 00		0 00	100 00
4	10.85	0 25		0 17	99 83
10	11.01	0 41		0 29	99 71
20	11.39	0 38	0 37	0 66	99 34
40	25 02	14 01	13 64	13 92	86 08
60	63.1	52 09	50 71	50 99	49 01
100	75 85	64 84	63 12	63 40	36 60
200	80.38	69 37	67 53	67 81	32 19

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	37	8	28 27	10 2	42 50199	0 013286	1 001385
2	33	8	24 37	10 9	31 00115	0 013286	1 001385
5	28	8	19 50	11 7	20 33125	0 013286	1 001385
15	23	8	14 62	12 5	12 14209	0 013286	1 001385
30	20	8	11 70	13 0	8 752613	0 013286	1 001385
60	17	8	8 77	13 5	6 304814	0 013286	1 001385
267	12	9	2 92	14 3	3 07807	0 013286	1 001385
1440	10	9	0 97	14 7	1 340491	0 013286	1 001385

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Sample Number	410A/NSM
Test Temperature	22
Specific Gravity	2.65

100 00	100 00	100 00	100 00	100 00	100 00	99 63	99 15	99 15	99 04	98 36	87 54	64 27	57 29	50 41	35 59	29 66	20 17	15 42	10 68	3 56	0 00
125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	29 8	19 6	12 0	7 7	5 8	3 1	1 3
5"	3"	2"	1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							

Wet Wt & Tare	26.45
Dry Wt & Tare	25.67
Wt Moisture	0 78
Wt Tare	1.57
Dry Soil	24 1
Moisture Content	0 032365145
Air Dry Total Sample	157.93
Oven Dry Total Samp	153 0249035
Air Dry Hydro Sample	86.31
Oven Dry Wt Hydro	83 60413987
Amount Plus #10	1 47
W (14 2) =	84 41505448

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5"	9.76	0 00		0 00	100 00
3"	9.76	0 00		0 00	100 00
2"	9.76	0 00		0 00	100 00
1 5"	9.76	0 00		0 00	100 00
1"	9.76	0 00		0 00	100 00
3/4"	9.76	0 00		0 00	100 00
1/2"	10.32	0 56		0 37	99 63
3/8"	11.06	1 30		0 85	99 15
4	11.06	1 30		0 85	99 15
10	11.23	1 47		0 96	99 04
20	11.8	0 57	0 68	1 64	98 36
40	20.94	9 71	11 50	12 46	87 54
60	40.58	29 35	34 77	35 73	64 27
100	46.47	35 24	41 75	42 71	57 29
200	52.28	41 05	48 63	49 59	50 41

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	44	8	42 71	9 1	40 04874	0 013286	1 001385
2	38	8	35 59	10 1	29 81181	0 013286	1 001385
5	33	8	29 66	10 9	19 60685	0 013286	1 001385
15	25	8	20 17	12 2	11 98219	0 013286	1 001385
38	21	8	15 42	12 9	7 727797	0 013286	1 001385
70	17	8	10 68	13 5	5 837123	0 013286	1 001385
259	12	9	3 56	14 3	3 125246	0 013286	1 001385
1440	9	9	0 00	14 8	1 347964	0 013286	1 001385

Sample Number	410B/NSM		100 00	100 00	100 00	100 00	100 00	100 00	99 18	99 18	99 18	99 14	98 36	77 39	36 90	28 52	25 44	17 52	13 62	9 73	7 79	5 84	0 97	0 00
			125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	32 6	21 2	12 5	9 0	6 4	3 2	1 3
Test Temperature		22 5"		3"	2"		1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity		2.65																						

Wet Wt & Tare	22.59
Dry Wt & Tare	22 14
Wt Moisture	0 45
Wt Tare	1 56
Dry Soil	20 58
Moisture Content	0 021865889
Air Dry Total Sample	187.27
Oven Dry Total Samp	183 2966049
Air Dry Hydro Sample	104.24
Oven Dry Wt Hydro	102 0094722
Amount Plus #10	1 58
W (14 2) =	102 89643

Sieve Analysis Portion

Sieve Size	Weight of Soil + Tare	Total Weight of Soil		Percent Retained	Percent Passing
5	10.1	0 00		0 00	100 00
3	10.1	0 00		0 00	100 00
2	10 1	0 00		0 00	100 00
1 5	10.1	0 00		0 00	100 00
1	10.1	0 00		0 00	100 00
3/4	10.1	0 00		0 00	100 00
1/2	11.61	1 51		0 82	99 18
3/8	11.61	1 51		0 82	99 18
4	11.61	1 51		0 82	99 18
10	11.68	1 58		0 86	99 14
20	12.48	0 80	0 78	1 64	98 36
40	34.06	22 38	21 75	22 61	77 39
60	75.72	64 04	62 24	63 10	36 90
100	84.34	72 66	70 61	71 48	28 52
200	87.51	75 83	73 70	74 56	25 44

Hydrometer Analysis Portion

Time	Hydro Reading	Comp Correct	Percent Finer	"L"	D	K	a
1	28	8	19 46	11 7	45 46206	0 013286	1 001385
2	26	8	17 52	12 0	32 59341	0 013286	1 001385
5	22	8	13 62	12 7	21 16783	0 013286	1 001385
15	18	8	9 73	13 3	12 53291	0 013286	1 001385
30	16	8	7 79	13 7	8 970269	0 013286	1 001385
60	14	8	5 84	14 0	6 418507	0 013286	1 001385
250	10	9	0 97	14 7	3 217178	0 013286	1 001385
1440	9	9	0 00	14 8	1 347964	0 013286	1 001385

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Sample Number	410C/NSM	100 00	100 00	100 00	100 00	100 00	100 00	100 00	100 00	99 86	99 77	99 29	84 18	51 19	42 64	39 59	31 17	24 94	17 57	13 60	9 63	2 27	0 00
		125000	75000	50000	37500	25000	19000	12500	9500	4750	2000	850	425	250	150	75	30 4	20 0	12 1	8 8	6 3	3 2	1 3
Test Temperature	22	5"	3"	2"	1 5"	1"	3/4"	1/2"	3/8"	4	10	20	40	60	100	200							
Specific Gravity	2 65																						

Wet Wt & Tare	16.77
Dry Wt & Tare	16.4
Wt Moisture	0 37
Wt Tare	1.57
Dry Soil	14 83
Moisture Content	0 024949427
Air Dry Total Sample	148.92
Oven Dry Total Samp	145 3030066
Air Dry Hydro Sample	90.35
Oven Dry Wt Hydro	88 15069079
Amount Plus #10	0 33
W (14 2) =	88 35134696

Sieve Analysis Portion

Sieve	Weight of	Total		Percent	Percent
5"	10 4	0 00		0 00	100 00
3"	10.4	0 00		0 00	100 00
2"	10 4	0 00		0 00	100 00
1 5"	10.4	0 00		0 00	100 00
1	10.4	0 00		0 00	100 00
3/4	10.4	0 00		0 00	100 00
1/2	10.4	0 00		0 00	100 00
3/8	10.4	0 00		0 00	100 00
4	10.61	0 21		0 14	99 86
10	10 73	0 33		0 23	99 77
20	11.16	0 43	0 49	0 71	99 29
40	24.51	13 78	15 60	15 82	84 18
60	53.65	42 92	48 58	48 81	51 19
100	61.21	50 48	57 14	57.36	42 64
200	63.9	53 17	60 18	60 41	39 59

Hydrometer Analysis Portion

Time	Hydro	Comp	Percent	"L"	D	K	a
1	37	8	32 87	10 2	42 50199	0 013286	1 001385
2	35.5	8	31 17	10 5	30 4123	0 013286	1 001385
5	30	8	24 94	11 4	20 04463	0 013286	1 001385
15	23.5	8	17 57	12 4	12 10231	0 013286	1 001385
30	20	8	13 60	13 0	8 752613	0 013286	1 001385
60	16.5	8	9 63	13 6	6 323904	0 013286	1 001385
250	11	9	2 27	14 5	3 199142	0 013286	1 001385
1440	9	9	0 00	14 8	1 347964	0 013286	1 001385

Total Solids

ARI Job ID: UU16

Extractions Total Solids-extts
Data By: Tarry Hawk
Created: 5/11/12

Worklist: 9987
Analyst: TH
Comments:

Oven ID:_____

Balance ID:_____

Samples In: Date:_____ Time:_____ Temp:_____ Analyst:_____

Samples Out: Date:_____ Time:_____ Temp:_____ Analyst:_____

	ARI ID CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	UU16A 12-8723 401A/DP	1.18	12.29	7.28	54.9	NR
2.	UU16B 12-8724 401B/DP	1.18	11.64	7.98	65.0	NR
3.	UU16C 12-8725 401C/DP	1.17	12.24	6.44	47.6	NR
4.	UU16D 12-8726 401A/NSM	1.17	10.75	8.37	75.2	NR
5.	UU16E 12-8727 401B/NSM	1.15	11.49	9.46	80.4	NR
6.	UU16F 12-8728 401C/NSM	1.18	12.51	7.43	55.2	NR
7.	UU16G 12-8729 410A/DP	1.17	11.86	7.15	55.9	NR
8.	UU16H 12-8730 410B/DP	1.16	11.47	8.64	72.6	NR
9.	UU16I 12-8731 410C/DP	1.18	13.54	9.35	66.1	NR
10.	UU16J 12-8732 410A/NSM	1.17	10.17	6.53	59.6	NR
11.	UU16K 12-8733 410B/NSM	1.17	12.70	9.74	74.3	NR
12.	UU16L 12-8734 410C/NSM	1.17	10.26	7.38	68.3	NR

Extractions Total Solids-extts
Data By: Tarry Hawk
Created: 5/11/12

Worklist: 9987
Analyst: TH
Comments:

Oven ID: 015

Balance ID: B1464-2614

Samples In: Date: 5/11/12 Time: 14:30 Temp: 105 Analyst: TH

Samples Out: Date: 5/12/12 Time: 0630 Temp: 99 Analyst: SP

	ARI ID / CLIENT ID	Tare Wt (g)	Wet Wt (g)	Dry Wt (g)	% Solids	pH
1.	UU16A 12-8723 401A/DP	1.18	12.29	7.28		NR
2.	UU16B 12-8724 401B/DP	1.18	11.64	7.98		NR
3.	UU16C 12-8725 401C/DP	1.17	12.24	6.44		NR
4.	UU16D 12-8726 401A/NSM	1.17	10.75	8.37		NR
5.	UU16E 12-8727 401B/NSM	1.15	11.49	9.46		NR
6.	UU16F 12-8728 401C/NSM	1.18	12.51	7.43		NR
7.	UU16G 12-8729 410A/DP	1.17	11.86	7.15		NR
8.	UU16H 12-8730 410B/DP	1.16	11.47	8.64		NR
9.	UU16I 12-8731 410C/DP	1.18	13.54	9.35		NR
10.	UU16J 12-8732 410A/NSM	1.17	10.17	6.53		NR
11.	UU16K 12-8733 410B/NSM	1.17	12.78	9.74		NR
12.	UU16L 12-8734 410C/NSM	1.17	10.26	7.38		NR

Solids Data Entry Report Checked by: KM Date: 5/15/12
Date: 05/15/12 Data Analyst: DM

Solids Determination performed on 05/14/12 by DM

JOB	SAMPLE	CLIENTID	TAREWEIGHT	SAMPDISH	DRYWEIGHT	SOLIDS
UU16	A	401A/DP	0.958	10.142	5.766	52.35
UU16	B	401A/DP	1.030	10.457	6.986	63.18
UU16	C	401A/DP	1.001	10.841	5.514	45.86
UU16	D	401A/DP	0.990	10.160	8.179	78.40
UU16	E	401A/DP	0.957	10.668	9.077	83.62
UU16	F	401A/DP	0.984	10.364	6.293	56.60
UU16	G	401A/DP	0.986	10.579	6.219	54.55
UU16	H	401A/DP	1.012	10.508	7.403	67.30
UU16	I	401A/DP	1.002	10.421	6.969	63.35
UU16	J	401A/DP	1.017	10.684	6.727	59.07
UU16	K	401A/DP	1.017	10.612	7.869	71.41
UU16	L	401A/DP	0.992	10.376	7.652	70.97

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Total Solids Bench Sheet

Laboratory Section Metals

Oven Identification: 07 **Balance ID:** 068755

Samples in Oven: Date: 5-14-12 Time: 0925 Temp: 103°C Analyst: DM

Removed from Oven: Date: 5-15-12 Time: 0655 Temp: 103°C Analyst: DM

ARI Sample ID	Tare Weight (g)	Tare + Sample Wet (g)	Tare + Sample Dry (g)	Date & Time Last Weight	Final Weighting >12 hrs[1]
UU16 A	0.958	10.142	5.766	—	✓
UU16 B	1.030	10.457	6.986	—	✓
UU16 C	1.001	10.841	5.514	—	✓
UU16 D	0.990	10.160	8.179	—	✓
UU16 E	0.957	10.668	9.077	—	✓
UU16 F	0.984	10.364	6.293	—	✓
UU16 G	0.986	10.579	6.219	—	✓
UU16 H	1.012	10.508	7.403	—	✓
UU16 I	1.002	10.421	6.969	—	✓
UU16 J	1.017	10.684	6.727	—	✓
UU16 K	1.017	10.612	7.869	—	✓
UU16 L	0.992	10.876	7.652	—	✓
		5-14-12	DM		

1) Place a check mark in this column if samples have dried > 12 but < 24 hours. When samples have been at 104°C < 12 hours, constant weight must be verified as described in SOP 10023S. Use a 2nd bench sheet for additional weightings.