Ohio Environmental Protection Agency
Integrated Alternative Waste Management Program

ALTERNATIVE WASTE MANAGEMENT PROJECT REQUEST

The Integrated Alternative Waste Management Program (IAWMP) is the means to obtain prior authorization for alternative waste disposal projects pursuant to OAC rule 3745-27-05(A)(4). Authorized alternative waste disposal projects include the placement of solid waste into or on the ground, such as engineered fill or land application. Incorporation of appropriate waste material into the manufacture of a final product is not considered disposal, and therefore not regulated by the agency. Contact the Division of Materials and Waste Management (DMWM) at (614) 644-2621 for more information.

APPLICANT (PERSON RESPONSIBLE FOR THE PROJECT) INFORMATION

Name:	John Taddonio (Manager)
Company (if applicable):	Rocky Ridge Development, LLC
Street Address:	3793 Silica Road
City:	Sylvania
County:	Lucas
State:	Ohio
Zip:	43560
Phone:	480-748-6854
Email:	jtaddonio@rockyridge.com
Alternative Contact Person:	*Click here to enter text.*

GENERATOR INFORMATION

Name:	Andrew McClure, Plant Administrator
Company (if applicable):	City of Toledo Collins Plant
Street Address:	3040 York St, Toledo, OH 43605
City:	Toledo
County:	Lucas
State:	Ohio
Zip:	43605
Phone:	419-936-3021
Email:	
Alternative Contact Person:	Chuck Campbell, Commissioner of Plant Operations

If the generator is different than the applicant, attach generator's written consent to use the waste in this project. Also attach statement from generator describing efforts to minimize waste generation.

PROPERTY OWNER INFORMATION

Name:	Charles Stansley and Scott Stansley
Company (if applicable):	Rocky Ridge Development, LLC
Street Address:	3793 Silica Road
City:	Sylvania
County:	Lucas
State:	Ohio
Zip:	43560
Phone:	419-360-9201
Email:	sstansley@etransferservices.com
Alternative Contact Person:	*Click here to enter text.*

If the property owner is different than the applicant, attach written consent of the property owner to dispose of solid waste at this location. List multiple property owners on a separate sheet.

GENERATOR EFFORTS TOWARDS WASTE MINIMIZATION AND RECYCLING

Description of efforts to prevent or reduce the generation of the waste stream and efforts to recycle or reuse the waste in a manner other than disposal – Attached.

WASTE CHARACTERIZATION

☒ **Waste Description: Attached (Include how the waste stream is generated.)**

☐ Other: *Click here to enter text.*

☒ **Description of physical and chemical characteristics attached:**

☐ Material Safety Data Sheets ☒ Total Test Results ☒ Lab Reports

☒ Other: A Material Characterization report is included within the application and describes the materials to beneficially used.

The generator shall attach a certification that the analysis is true, accurate and representative of the solid waste.

PROJECT INFORMATION

Project Location: Rocky Ridge Quarry – 14591 W Toussaint, Graytown, Ohio 43432

Describe proposed use of waste material in this project:
Embankment/Fill to reclaim the former Rocky Ridge Quarry

Attach contingency plan for disposal of any solid waste brought to project site that cannot be used.

Anticipated start date of project:	Upon approval	Estimated completion date:	Yet to be determined, dependent upon amount of DWTM received.

Describe use of waste in other IAWMP projects (if known):
None known.

Estimated volume of waste in this project:	3.6 million cubic yards	Rate of Disposal:	90,000 cubic yards of wet DWTM per year

Method(s) of application for land application requests: N/A

Attach plan drawing of the proposed limits for solid waste disposal.

CERTIFICATION BY APPLICANT

I have personally examined all information and attachments in this project request and all of the information submitted is true and accurate to the best of my knowledge.

Name: _____ Date: _____

John Taddonio

Please print/type name entered above.

FOR MULTIPLE PROPERTY OWNERS INFORMATION	
Name:	*Click here to enter text.*
Company (applicable):	*Click here to enter text.*
Street Address:	*Click here to enter text.*
City:	*Click here to enter text.*
County:	*Click here to enter text.*
State:	*Click here to enter text.*
Zip:	*Click here to enter text.*
Phone:	*Click here to enter text.*
Email:	*Click here to enter text.*
Alternative Contact Person:	*Click here to enter text.*
Name:	*Click here to enter text.*
Company (applicable):	*Click here to enter text.*
Street Address:	*Click here to enter text.*
City:	*Click here to enter text.*
County:	*Click here to enter text.*
State:	*Click here to enter text.*
Zip:	*Click here to enter text.*
Phone:	*Click here to enter text.*
Email:	*Click here to enter text.*
Alternative Contact Person:	*Click here to enter text.*
Name:	*Click here to enter text.*
Company (applicable):	*Click here to enter text.*
Street Address:	*Click here to enter text.*
City:	*Click here to enter text.*
County:	*Click here to enter text.*
State:	*Click here to enter text.*
Zip:	*Click here to enter text.*
Phone:	*Click here to enter text.*
Email:	*Click here to enter text.*
Alternative Contact Person:	*Click here to enter text.*
Name:	*Click here to enter text.*
Company (applicable):	*Click here to enter text.*
Street Address:	*Click here to enter text.*
City:	*Click here to enter text.*
County:	*Click here to enter text.*
State:	*Click here to enter text.*
Zip:	*Click here to enter text.*
Phone:	*Click here to enter text.*
Email:	*Click here to enter text.*
Alternative Contact Person:	*Click here to enter text.*

Upon review of this request Ohio EPA's DMWM may require additional narratives, plan drawings, and/or detailed engineering plans. Examples include, but may not be limited to, the following information:

A flow diagram and narrative describing the process producing the waste

Location and limits of project site and all waste storage areas
(If this project is at a solid waste facility this could include plan view drawings identifying footprint of existing waste, proposed locations of waste placement in this project, and all waste storage areas)

Hydrologic characterization

Location and limits of regulatory floodplain

Existing topography showing adjacent lakes, streams, wetlands, springs, or other surface waters

Depth to the uppermost aquifer system and lowest elevation of waste placement

Aquifer boundaries declared by the U.S. government under the Safe Drinking Water Act to be a sole source aquifer

Limits of any unconsolidated aquifer systems delineated on the Ohio Department of Natural Resources (ODNR) ground water resource maps as yielding at least 100 gallons per minute

Ohio EPA-endorsed wellhead protection area and any public or private water supply well

Stormwater run-on/run-off control measures

Total acreage of project site and boring logs for large volume land application projects

A list of the permits, licenses, plan approvals, authorizations or other approvals that have been or may be applied for and the local, state, or federal office where application has been or may be made

Location and boundaries of any natural areas listed below:

National parks or national recreation areas and state parks or state recreation areas;
Areas listed by ODNR as a state nature preserve, state wildlife area, or state scenic river;
Areas designated, owned, and managed by the Ohio Historical Society as a nature preserve;
Areas designated by the U.S. Forest Service as a special interest area or natural research area in the Wayne National Forest;
Stream segments designated by Ohio EPA as a state resource water, a coldwater habitat, or an exceptional warm water habitat.

ATTACHMENT A

INTEGRATED ALTERNATIVE WASTE MANAGEMENT PLAN FOR ROCKY RIDGE QUARRY

FOR THE:
ROCKY RIDGE QUARRY
14591 W TOUSSAINT N
GRAYTOWN, OHIO 43432

PREPARED FOR:
ROCKY RIDGE DEVELOPMENT LLC
3793 SILICA ROAD
SYLVANIA, OHIO 43560

PREPARED BY:
HULL & ASSOCIATES, INC.
3401 GLENDALE AVENUE
SUITE 300
TOLEDO, OHIO 43614

~~**JULY 2016**~~**REVISED SEPTEMBER 2016**

HULL

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1.0 INTRODUCTION

Rocky Ridge Quarry (Site) is located at 14591 W. Toussaint North in Graytown, Ottawa County, Ohio, as shown in Figure 1. Ottawa County is approximately 270 square miles and is bounded by Lucas, Wood, and Sandusky Counties~~y~~ and Lake Erie. Land use of the surrounding property is primarily agricultural with residential housing bordering the south of the Site. The geologic setting in Ottawa County is mainly comprised of unconsolidated glacial and lake deposits overlaying a sequence of flat-lying sedimentary rocks. The county is located in the flat-lying Eastern Lake Plains section of the Central Lowlands physiographic region, which is characterized by lake bed sediments deposited by a series of Pleistocene-aged lakes of glacial origin. Topography is nearly level to gently sloping and barely above Lake Erie water levels (Ohio Department of Natural Resources [ODNR], 1994).

The thick sequence of carbonate bedrock from the Devonian and Silurian periods comprises a vast regional aquifer that serves as primary source of groundwater for many counties in Northwest Ohio. Ottawa County lies near the northeastern corner of this regional aquifer (ODNR, 1994). The regional carbonate aquifer, which underlies all of Ottawa County and served as a source of groundwater for much of the rural population, is buried by unconsolidated glacial deposits. Groundwater within the dolomite of the carbonate aquifer occurs in a network of interconnected fractures, bedding planes, and solution channels.

Potentiometric maps for most of Ottawa County shows a general northeastward trending slope, indicating regional groundwater flow from sources of recharge in northern Ohio towards zones of discharge along Lake Erie (Schmidt, 1986). ~~The thick sequence of carbonate bedrock from the Devonian and Silurian periods comprises a vast regional aquifer that serves as primary source of groundwater for many counties in Northwest Ohio. Ottawa County lies near the northeastern corner of this regional aquifer (ODNR, 1994). The regional carbonate aquifer, which underlies all of Ottawa County and served as a source of groundwater for much of the rural population, is buried by unconsolidated glacial deposits. Groundwater within the dolomite of the carbonate aquifer occurs in a network of interconnected fractures, bedding planes, and solution channels.~~

Rocky Ridge Development, LLC (Rocky Ridge), acquired the former StoneCo Quarry near Rocky Ridge in 2015 and acquired an additional contiguous 138 acres of agricultural land in February 2016 to allow for borrow soil areas as well as agricultural test plots ~~to be~~ to be developed in partnership with various universities. We are assisting Rocky Ridge Development, LLC to proactively seek solutions to help complete a quarry reclamation in accordance with ODNR's quarry closure and reclamation requirements for a portion of the 35-acre excavation area, the 5-acre disturbed upland area, and possibly integrate a reclamation/habitat restoration project into the overall site stabilization plan.

Rocky Ridge Development, LLC plans to receive, blend, and place soil mixed with City of Toledo (COT) Drinking Water Treatment Material (~~/lime~~DWTM) ~~materials~~ from the lagoons at the Collins Park Treatment Facility at the Site within the footprint of the former mine. ~~Lime~~DWTM will be transported from ~~nearby areas~~COT Collins Park to the Site, where it is planned to be blended by volume with conventional construction equipment, and placed on-Site in accordance with this IAWMP and applicable Ohio EPA approvals. Regional soils will be utilized with the imported ~~lime~~DWTM to create the blended embankment/fill material. In order to ensure proper placement of embankment/fill, representative samples of the soils and ~~lime~~DWTM were collected by Rocky Ridge and subject to geotechnical laboratory testing (see Appendix ~~G~~F). Additionally, environmental testing of these materials was performed and are being presented under a separate cover. The results of the laboratory-based analysis were used to establish proposed construction methods (e.g., optimal blends for the ~~lime~~DWTM and soil blend, lift thicknesses, material preparation for placement and compactability, etc.) to be followed during placement of the material at the Site.

Rocky Ridge Development, LLC, owners have 40+ years of experience in the environmental and aggregate industry in northwest Ohio. Our company believes that reclaiming old quarries is one of the best practices to manage ~~spent lime~~DWTM. We look forward to being an active ally in material management and hope to help create win-win solutions for managing on-site soils, ~~spent lime~~DWTM, and reclaiming quarries.

2.0 GENERATOR EFFORTS TOWARDS WASTE MINIMIZATION AND RECYCLING

2.1 General

Rocky Ridge is currently utilizing ~~spent lime~~drinking water treatment material (~~DWTM~~DWTM~~)~~ from the City of Toledo wastewater lagoons that would otherwise require disposal. As a result, the current use of ~~DWTM~~DWTM ~~spent lime~~ as part of the LAMP and the proposed beneficial use of Blended Fill (~~DWTM~~DWTM ~~spent lime~~/soil) to fill the quarry will utilize materials that would otherwise require disposal. No byproducts or coproducts are generated with the exception of storm water, which is covered under a National Pollution Discharge Elimination System (NPDES) permit. The NPDES permit is for final effluent discharge from a surface water detention pond to Packer Creek. This permit is effective November 1, 2015 and expires October 31, 2020. The permit requires the monthly monitoring/reporting of the pH and total suspended solids (TSS), and a 24-hr discharge volume. The pH must be between 6.5 and 9.0 and the TSS cannot exceed 30 mg/L monthly and a maximum of 45 mg/L. Additionally, the TSS loading cannot exceed 164 kg/day on a monthly basis and cannot exceed a daily maximum of 246 kg/day.

Section G of the current NPDES permit states that the current permit covers construction activities including any earth disturbance, including clearing, grading, excavating, grubbing and/or filling, that disturb one acre or more of total land. The permit also authorizes storm water discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging yards, material storage areas, excavated material disposal areas, borrow areas) provided they comply with the conditions of the permit.

Per a discussion with Ohio EPA on September 2, 2016, Ohio EPA stated that the current NPDES permit covers activities anticipated under this project. As a result, a NPDES permit modification is not needed for this proposed IAWMP project.

2.2 Description of Chemical and Physical Characteristics

Rocky Ridge coordinated the sampling and analysis approach with Ohio EPA prior to implementation. Lagoon and on-site soil sampling was completed between April 7, 2016 and April 26, 2016. A Field Sample and Analysis Plan (FSAP) was prepared to guide Rocky Ridge with sampling methods. The FSAP is provided in Appendix A. The FSAP proposed sampling all three lagoons, however based on field conditions only Lagoons D and E were sampled. The Beneficial Use Characterization Report is included in Appendix B. Totals analyses were completed on the DWTM and DWTM/soil blends and Synthetic Precipitation Leaching ~~Soil~~ Procedure (SPLP) was completed on the DWTM/soil blends.

Totals data for the ~~DWTM~~DWTM Lagoon and soil/~~DWTM~~DWTM~~lime~~ blend sample data were compared to five relatively arbitrary standards/screening values (listed in general order of conservativeness – least to most):

- Ohio Voluntary Action Program (VAP) Residential Land Use
- Ohio VAP Generic Leach-Based Soil Values for Soil Class III for source ≥1/2 acre
- USEPA Region 9 Regional Screening Levels (RSL) Direct Contact Residential RSL
- USEPA Region 9 Protection of Groundwater Resident Soil to Groundwater Soil Screening Level (SSL) – Maximum Contaminant Level (MCL)
- USEPA Region 9 Protection of Groundwater Resident Soil to Groundwater Soil Screening Level (SSL) – Risk-Based Level
-

In addition, select total metal results were compared to the published background metal information for Lucas County, as there is no background study for Ottawa County.

SPLP data for the soil/DWTM blend sample data were compared to the following:

- 2014 VAP Generic Unrestricted Potable Use Standard
- May 2016 Residential Soil to GW RSL THQ=0.1
- May 2016 Residential Soil to GW RSL THQ=1.0
- Primary and secondary drinking water standards
- On-site and regional groundwater concentrations

2.2.1 ~~DWTM~~DWTM ~~Spent Lime~~ Characterization

Chemical characterization of the ~~DWTM~~DWTM ~~spent lime~~ within Lagoon D and E was completed to demonstrate the suitability of the material for the proposed project. Totals analyses were completed and the most conservative sample identified. This sample was then used to create soil~~/lime~~/~~DWTM~~DWTM blends to represent possible combinations.

Table 1 presents the chemical results of the lagoon ~~DWTM~~DWTM~~lime~~ samples. No parameters from the ~~DWTM~~DWTM~~lime~~ samples exceeded the Ohio VAP standards. Five metals exceeded one or more of the USEPA Region 9 levels, however all but one metal (selenium) were below background for Lucas County. There is no established background concentration for selenium in Lucas County. Lagoon E had six PAHs that

exceeded one or more USEPA Region 9 levels. Sample E-2 was determined to be the most conservative ~~DWTM~~DWTM sample based on the COCs and concentrations present and therefore was used to create the soil/~~DWTM~~DWTM~~lime~~ blends.

2.2.2 On-Site Soil Characterization

On-Site soils were also sampled at Rocky Ridge from four (4) locations within the proposed borrow area and geotechnical analyses completed. No chemical analyses were completed on the native on-site soils; however, the geotechnical results were used to select one on-site sample to use to create the blends along with the most conservative spent ~~DWTM~~DWTM ~~lime~~ sample.

The four native on-Site soil samples tested can be described as a lean clay with sand or a lean clay and classified with the USCS group symbol of "CL". As expected, the maximum dry density decreased, with an increasing percentage of ~~lime~~~~DWTM~~DWTM. The optimum moisture content of the blended material was also relatively consistent – the higher the maximum dry density, the lower the optimum moisture content. As previously mentioned, the blends were mixed by volume, not by weight, and thus should be comparable to how the material will be handled and blended by construction equipment on-Site ~~(i.e., with an excavator bucket)~~.

The Summary of Geotechnical Laboratory Testing Results with more detailed results and discussion is included as an attachment in Appendix B. Geotechnical laboratory reports are included in Appendix ~~G~~F.

2.2.3~~2~~ Blended Fill~~Spent Lime/Soil Blend~~ Characterization

The following three soil/ ~~DWTM~~DWTM~~lime~~ blends were selected for the testing program and 3 replicates of each mix were prepared using the selected ~~spent lime~~~~DWTM~~DWTM and on-site soil sample:

- 50% Native Soil and 50% ~~DWTM~~DWTM~~Lime~~
- 67% Native Soil and 33% ~~DWTM~~DWTM~~Lime~~
- 33% Native Soil and 67% ~~DWTM~~DWTM~~Lime~~

Following the review of the totals data, one blend sample of each mix was analyzed ~~for Synthetic Leaching Soil Procedure (SPLP).~~using SPLP The objective of this analysis is to simulate material sitting in-situ exposed to rainfall (with an assumption that the rainfall is slightly acidic) then evaluate the organic and inorganic analytes present. Generally, the SPLP method simulates environmental precipitation and the leaching potential of a contaminant in soil, and offers a method to assess chemical mobility in the environment. Upon approval of this permit, Rocky Ridge will develop a performance monitoring plan to characterize the

blended materials on a volume basis to ensure that blended materials being placed are meeting or exceeding the performance standards that were used in the initial blended material characterization.

2.2.32.1 Totals Analysis Results

Table 2 presents the chemical results of the soil/~~DWTM~~DWTM~~lime~~ blend samples. No parameters reported above the method detection limits (MDL) exceeded the Ohio VAP standards. Two metals, arsenic and thallium, exceeded one or more of the USEPA Region 9 levels, however thallium results were below background for Lucas County and arsenic was generally similar to background, with samples exceeding Lucas County background marginally.

For the 33/67 soil/~~DWTM~~DWTM~~lime~~ blend parameters detected above the MDL, in addition to arsenic and thallium exceedances, one of the three samples exceeded the RSL for benzo(a)pyrene. Some metals exceeded the Soil to Groundwater SSL MCL levels but no other parameters exceeded the Soil to Groundwater SSL MCL. Cyanide exceeded the Soil to Groundwater RBL in all three samples, and one sample exceeded the RBL for benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene.

For the 50/50 soil/~~DWTM~~DWTM~~lime~~ blend parameters detected above the MDL, in addition to arsenic and thallium exceedances, one of the three samples exceeded the RSL for benzo(a)pyrene. Some metals exceeded the Soil to Groundwater SSL MCL levels but no other parameters exceeded the Soil to Groundwater SSL MCL. Cyanide exceeded the Soil to Groundwater RBL in all three samples, and one sample exceeded the RBL for benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene.

For the 67/33 soil/~~DWTM~~DWTM~~lime~~ blend parameters detected above the MDL, only arsenic and thallium exceeded the RSL. No other parameters exceeded the RSLs. Some metals exceeded the Soil to Groundwater SSL MCL levels but no other parameters exceeded the Soil to Groundwater SSL MCL. Cyanide exceeded the Soil to Groundwater RBL in all three samples, and one sample exceeded the RBL for 4,6-dinitro-o-cresol.

2.2.32.2 SPLP Analysis Results

The soil/~~DWTM~~DWTM~~lime~~ blends were then analyzed using the SPLP and compared to various screening standards, including Ohio VAP, Primary and Secondary Drinking Water, USEPA RSLs for residential soil to groundwater, and on-site/local groundwater wells. The objective of the SPLP~~is~~ analysis is to simulate material sitting in-situ exposed to rainfall (with an assumption that the rainfall is slightly acidic) then evaluate the organic and inorganic analytes present. Generally, the SPLP

method simulates environmental precipitation and the leaching potential of a contaminant in soil, and offers a method to assess chemical mobility in the environment., similar to what would happen if rain ran through the blends. No parameters exceeded the Ohio VAP unrestricted potable use standards or the Ambient Groundwater Quality observed at the Elmore Water Works Public Supply well (39OTT00139) in Elmore, Ohio (sampled and reported by the Ohio EPA in 2013). The four onsite observation wells, as well as the quarry lake were sampled to represent pre-DWTM filling conditions (at the current static water level). The results are forthcoming and will be provided under separate cover.

Table 3 presents the chemical results of the SPLP. No parameters from the blends exceeded the Ohio VAP standards or other screening levels. Arsenic exceeded the USEPA RSL for Soil to Groundwater but were well below Primary and Secondary Drinking Water Standards.

2.3 Hydrogeological Modeling[MB1]

To determine the potential water table drawdown associated with mined area dewatering operations conducted at the Site, Hull subcontracted In Aquas Veritas to construct and evaluate a computer-based numerical simulation of the Site and its surrounding area. The simulation of the projected groundwater depression, and subsequent rebound, was conducted using Waterloo Hydrogeologic's Visual MODFLOW (version 4.3). Visual MODFLOW is a well-known three-dimensional groundwater flow model that uses code originally developed by the USGS (MODFLOW). MODFLOW is a finite-difference groundwater flow model, which can accommodate anisotropic, heterogeneous aquifers in two or three-dimensional domains. The model allows transient flow simulations, and can handle confined, semi-confined, or unconfined conditions under active pumping or variable natural flow regimes. The methodology and detailed discussion is included in Appendix B.

The model was used to estimate the time needed to completely dewater the mined area under existing pumping rates as well as estimate the total drawdown in the area of the mined area under continued dewatering activities. In order to estimate the time needed to dewater the mined area, the model was run until the modeled recovery well ran dry. This occurred after approximately 280 model days. Based on the model, the rebound of the water table to background conditions will take several years to complete. Initial rebound of the water table will be relatively rapid due to the significant head difference between the surrounding aquifer and the mined area floor. As the external and internal head values become more similar, the rate of rebound will be reduced. The model suggests that full background conditions will be achieved within approximately 5 years, although 75% of background should be reached within approximately 1 year at the mined area location.

Based on the chemical, geotechnical, and hydrogeological modeling, it is unlikely that any analytes would dissolve/react as water flows through it. Following filling activities, it is not expected that the blended material will impact the groundwater quality.

Upon approval of the permit application, Rocky Ridge will develop a groundwater monitoring plan for the Site. The plan would be developed to monitor both flow (level) and chemical characteristics of the groundwater at the Site during and after DWTM filling operations at the Site.

3.0 PROJECT OVERVIEW

3.1 Facility Location

Beneficial use of the ~~DWT~~DWTM~~M spent lime~~ is proposed at the Rocky Ridge Quarry property located at 3017 N State Route 590, Graytown, Ottawa County, OH 43432. A facility site map is provided as Figure 1.

3.2 Proposed Use and Implementation

The proposed beneficial use of the ~~DWT~~DWTM~~M spent lime~~ facilitates reclamation of the Rocky Ridge quarry back to near surrounding grades, while utilizing a material that otherwise requires an off-site disposal facility. The abandoned quarry provides substantial and sustainable air space for long-term placement and permanent storage of the ~~DWTM~~DWTMR~~spent lime~~, provided the blending of the ~~DWTM~~DWTM ~~spent lime~~ with soil as discussed herein. Rocky Ridge Development, LLC (the Operator) proposes to blend the ~~DWTM~~DWTM ~~spent lime~~ with soil to create a stable, engineered fill material inside the quarry. Based on laboratory testing and Site knowledge, use of this material as engineered fill will not create a nuisance or harm human health or the environment, and is capable of complying with other applicable laws.

3.2.1 Description of Excavation Approach and Subgrade Preparation Protocol

Minimal excavation is anticipated as part of the IAWMP, other than excavation of the native on-site soils as borrow for blending and embankment. However, existing loose material on the quarry bench will be cleared prior to placement of Blended Fill. Existing rock and stone piles will be removed and used on-site for road base or taken off-site. Existing ~~e~~ quarry lime fines (i.e., lime generated from quarry operations and ~~is~~ not DWTM lime) stockpiles may either be removed, utilized during blending activities, or left in place. Existing ~~lime~~~~DWTDWTM~~quarry lime fine stockpiles may only be left in place as long as they can be proven to provide a stable, suitable subgrade for Blended Fill. Ultimately, a subgrade surface will be cleared down to competent rock or to a stable, suitable subgrade, which shall be graded to promote positive drainage towards the south end of the quarry. A stable, suitable subgrade is achieved if the subgrade passes a proof roll with a fully-loaded tandem axle dump truck (or equivalent). Additionally, any debris or equipment previously submerged prior to dewatering shall be removed from the quarry and properly disposed/stored prior to placing Blended Fill (~~DWTM~~DWTM/soil).

3.2.2 Description of Process/Blending

The Operator plans to utilize construction equipment to blend ~~DWTM~~DWTM ~~spent lime~~ with soil. The soil source used to blend with the DWTM will be native soil generated from borrow areas in the adjacent farm fields owned by Rocky Ridge Development, LLC. Based on the depth to bedrock as reported by local bedrock maps, it is anticipated there is an adequate volume of overburden soil available on-site for the

proposed operations. ~~Soil sources may be native soil on other portions of the Site, or other off-site borrow sources. If off-Site borrow sources are desired, the Operator will request approval from Ohio EPA prior to use as a component of Blended Fill.~~

The Operator plans to perform blending activities within the quarry, in small (approximate one-acre), efficient work areas. These one-acre blending cells ~~Work areas~~ will be prepared on a competent, stable, suitable subgrade and constructed with a 6~~six~~-foot tall soil berm around the perimeter of the individual one-acre blending cells. In order to import DWTM, dewater and dry the DWTM, blend material, and place/compact material in an efficient manner; it is anticipated that the Operator will utilize multiple cells at a time. To facilitate an iterative and systematic process, the Operator will generally follow these procedures when utilizing the cells:

1. Construct 6-foot tall soil berms to create approximate one-acre blending cells.

2. Construct h~~H~~aul roads ~~will be constructed~~ to allow dump trucks to offload ~~DWTM~~DWTM ~~spent lime~~ directly into the various blending cells.

3. An initial cell will be used to dewater and dry out the DWTM to a workable moisture content. The DWTM will be placed in minimum 6 inch lifts up to maximum 2-foot lifts and allowed to dry out. The DWTM will be dewatered using various techniques to achieve a moisture content that will satisfactorily mix with soil to achieve a workable moisture of the Blended Fill. For example, the DWTM may be "turned over" with excavators or dozers, or with pull-behind discs, to expedite the drying process.

4a. If the DWTM is placed in a 6-inch lift and the material is at an acceptable moisture content, a 12-inch thick soil lift may then be placed over the DWTM to facilitate the 2:1 ratio for blending. The DWTM and soil will then be mixed in-place within the cell with a dozer and/or a pull-behind disc to create a relative homogenous blend and to minimize "patching". The 18-inch thick layer of blended material will then be compacted in place and the process repeated until the blending cell is at capacity.

4b. If the DWTM is placed in a 6 to 24-inch thick lift, the material will remain in the cell until it is at an acceptable moisture condition. Once the material has dried out, the DWTM will be relocated to an adjacent cell and placed in a 6-inch lift and blended/compacted in a similar manner as discussed in Step 4a. Alternatively, as the DWTM material is relocated to an adjacent cell, the soil may be incorporated simultaneously to create the proper 2:1 blending ratio as the material is being placed and then compacted.

5. Upon achieving a satisfactory blend in Step 4a or 4b, the Blended Fill will be spread in eighteen-inch (18") maximum loose lift thicknesses. Each lift will be compacted with a sheepsfoot compactor in order to meet the ninety-five percent (95%) compaction specification at to +3% above (i.e., 0 to 3% above) its optimum moisture content as determined by Standard Proctor (ASTM D698). The Operator is proposing to use a Holmes 60x60 sheepsfoot, pull-behind roller to compact the Blended Fill. Manufacturer's information on the compactor is provided in Appendix ~~H~~G. (An alternate compactor may be used, provided it is a minimum 12-ton sheepsfoot compactor.)

6. One to several cells may be used concurrently to dry out the DWTM. Similarly, one to several cells may be used to blend, place, and compact the Blended Fill. As the blending cells near

capacity, new blending cells will be constructed adjacent to or over previously completed blending cells – the construction and filling of the blending cells will continue to fill the quarry.

The Operator may adjust the procedures as outlined above provided that the blending process creates a ~~Based on volume, the DWTMDWTM spent lime will be dumped into the earthen berm area until a specified volume is reached so the~~ final Blended Fill that has a ~~is a~~ ratio of one (1) part decanted-~~spent limeDWTMDWTM~~ to two (2) parts soil (by volume). Note that the Blended Fill will be mixed in bulk, and that the 2:1 blend ratio may vary slightly from one area to another due to differences in moisture content, blend process, soil variances, or other factors. ~~The DWTMDWTM spent lime would be dewatered using various techniques to achieve a moisture content that will satisfactorily mix with soil to achieve optimum moisture in the Blended Fill.~~

~~Then, soil will be added to the cell and mixed/blended with the dewatered DWTMspent lime using a dozer, excavator, tractor, or other construction equipment. Upon achieving a satisfactory blend, the Blended Fill shall be spread in eighteen-inch (18") maximum loose lift thicknesses. Each lift will be compacted with a minimum 12-ton sheepsfoot compactor in order to meet the ninety-five percent (95%) compaction specification at +/-3% optimum moisture content as determined by Standard Proctor (ASTM D698). Note that the Blended Fill will be mixed in bulk, and that the 2:1 blend ratio may vary slightly from one area to another due to differences in moisture content, blend process, soil variances, or other factors.~~

As previously discussed, i~~I~~n order to import ~~DWTMDWTMspent lime~~, blend material, and place/compact material in an efficient manner, it is anticipated that the Operator will utilize multiple cells at a time. Additionally, the Operator may elect to berm a portion of the property to the north and to the west of the quarry to create additional blending areas. If utilized, the Blended Fill would be mixed in those cells, and transported, placed, and compacted within the quarry at a later time.

Interim berms within the quarry are anticipated to be constructed between cells utilizing either Blended Fill or soil. The maximum slope shall be 2H:1V. If Blended Fill is utilized for interim berms, they shall be constructed in lifts and compacted as previously specified if they are intended to remain in-place.

3.2.3 Storm Water Management Strategy

Perimeter screening berms are currently under construction around the perimeter of the quarry pursuant to the approved LAMP and ODNR's reclamation plan, which not only screens the work area from surrounding properties, but minimizes additional storm water from entering the quarry. The overall storm water management strategy of the IAWMP is to minimize the potential for ~~DWTMDWTMlime~~ decant water (i.e., liquids that separate from the ~~limeDWTMDWTM~~ come into contact with the DWTM~~residuals~~) to either enter the quarry water or to leave the site. The quarry bench will be prepared in a manner to promote positive

storm water drainage to the deep end of the quarry utilizing appropriate erosion and sediment controls. Blending and ~~DWTM~~DWTM ~~spent lime~~ storage areas will be bermed to prevent ~~DWTM~~DWTM~~lime~~ decant water from mixing with storm water and entering the deep end of the quarry.

The current location of the dewatering pump is in the northwestern corner of the quarry, within an existing pit or pond. The dewatering pump discharges to a drainage ditch, which is a permitted NPDES outfall. The IAWMP strategy is to utilize this pond as a location to collect decant water, where it will be contained within this pond, and quickly discharged to the permitted outfall. This may require a permit modification to the existing permit. The Stormwater Management Plan is included in Appendix C.

3.2.4 Description of Placement of Blended Fill

Upon preparation and survey of the quarry bottom, the Blended Fill will be placed and compacted in lifts within blending ~~small~~ cells in the quarry as described ~~specified~~ in the sections above. The placement of Blended Fill is scheduled to be performed in three general (3) Phases:

Phase 1: This phase will include placement of Blended Fill in the northern portion of the quarry on the mid-level bench at an approximate elevation 552 feet (NAVD88). The proposed design grades for Phase 1 are included in the Plans found in this IAWMP in Appendix D. This will require maintaining the water elevation of the quarry below the quarry bench and all subsequent Fill Areas of the Phase. Noteworthy items of Phase 1:

- A soil Diversion Berm will be constructed at the edge of the El. 552 feet bench for both safety and water management purposes.
- A minimum forty-foot (40') buffer will remain between the toe of Blended Fill and the edge of the El. 552 feet bench to provide ample work room for maintenance, equipment access, stormwater management, and to facilitate Phase 2 work activities.
- ~~Blended Fill will not be placed against the quarry walls until that final sub-phase of Phase 1.~~
- Maximum Phase 1 final slopes are 3H:1V, while interim slopes can be at a maximum of 3.5~~2~~H:1V.
- Minimum final Phase 1 slopes are at 2% to promote positive drainage, and erosion control features (I.e., check dams, rock letdowns, etc.) shall be installed upon completion of final grades.

Phase 2: This phase will consist of placement of Blended Fill within the deeper southern portion of the quarry, at approximate elevation 496 feet. This will require dewatering the entire quarry to allow for placement of Blended Fill on a dry, competent subgrade surface. The proposed design grades for Phase 2 are included

in the Plans found in this IAWMP in Appendix D. ~~The design grades for this Phase will be provided at a later date.~~

Phase 3: This phase will consist of placing Blended Fill within the limits of the quarry (I.e., within the screening berm), and on top of previous placed Blended Fill. The design grades (maximum elevation of ~617.5 feet) will slightly exceed surrounding farm field elevations to allow positive drainage away from the reclaimed quarry. The proposed design grades for Phase 3 are included in the Plans found in this IAWMP in Appendix D. ~~The design grades for the Phase will be provided at a later date.~~

~~3.2.5 Contingency Plan~~

~~A Contingency Plan has been prepared as part of the IAWMP application to present a plan for providing the surrounding properties with potable water (e.g., installation of a waterline, hauling of water, etc.) in the event the activities at the Site negatively impact groundwater quality. This contingency plan is similar to the plan required by the Ohio Department of Natural Resources for Coal Mining. Refer to Appendix E for the Contingency Plan.~~

3.2.~~6~~5 Engineering Controls

Engineering Controls are necessary for this project to be protective of human health and the environment during the course of the project. Most notably, the main purpose of these engineering controls is to minimize or prevent an impact to surrounding groundwater via quarry water. Additionally, it is known that the Site is located on well fractured limestone, which provides additional avenues to the surrounding groundwater aquifer. To mitigate potential problems, the following Engineering Controls are proposed to be implemented:

- Maintain Quarry Dewatering: To ensure the work area remains dry and uncompromised, the water elevation inside the quarry will be maintained below the work areas. The quarry water will be dewatered and discharged through the existing, permitted dewatering system. If ~~lime~~DWTM~~sludge~~ decant water is to be discharged through the existing outfall, an NPDES permit modification will be required. The current location of the dewatering pump in an existing pond will require relocation as the IAWMP Phases move forward. Portable dewatering or transfer pumps may also be utilized to facilitate local decanting or dewatering efforts.

- Bench Cell Liner: For blending activity efficiency, it is necessary for the blending to occur within the quarry in small, approximately one-acre cells. To minimize leaching of the high-moisture ~~lime~~DWTM~~sludge~~ into the limestone fractures of the quarry bench, a three-foot (3) thick soil or Blended Fill barrier layer will be installed in each cell on suitable subgrade prior to receiving ~~spent lime~~DWTM within the quarry. A liner is required in each cell located directly on the bottom of the existing quarry. Six-foot (6') tall berms

consisting of either soil or Blended Fill will also be constructed on the outside edges of each cell to contain the decant water.

- Diversion Berms: A Diversion Berm will be constructed with soil near the edge of the existing quarry bench at approximate elevation 552. These berms have a dual purpose in providing safety to trucks and construction equipment, as well as to prevent unwanted stormwater or decant water migration into the quarry water.

- AquaGate: If necessary, a stormwater treatment Best Management Practice (BMP) consisting of an AquaGate® structure may be installed to treat and discharge water into the quarry. AquaGate is a patented bentonite granular material designed to reduce pollutants as water passes through it. The use of AquaGate will require a site-specific design, and it may be required as part of an NPDES permit modification.

3.3 Anticipated Dates of Start and Completion

The Operator anticipates commencing IAWMP activities immediately pending Ohio EPA approval and completion of the perimeter screening berm currently in process and being completed as part of the approved LAMP and ODNR mining reclamation plan. As such, beneficial use of DWTMDWTM spent lime would be implemented approximately September or October 2016. The Operator anticipates the project will be completed in approximately 10ten years from project start.

3.4 Other IAWMP Projects

All imported DWTMDWTM spent lime is anticipated to be beneficially used on-Site. No use of DWTMDWTM imported spent lime is proposed for other IAWMP projects at this time.

At this time, this is the first known IAWMP project utilizing DWTMDWTM spent lime for beneficial use. Historical uses of lime products, rather than lime sludge or lime wastes, have been and continue to be used in lesser blended amounts in the construction industry to modify soil moisture.

3.5 Estimated Volume and Rate of Disposal

Based on the estimated airspace volume within the quarry using bench elevations of 552 and 496 feet, respectively, from the Site's mining permit IM-320, and utilizing a general top elevation of 590 feet, there is roughly 3.6 million cubic yards (CYs) available within the quarry for beneficial use of blended material. This volume will be further refined as the internal quarry bench grades are prepared and surveyed for accuracy, as well as a final design for Phases 2 and 3 is completed. This volume does not include screening berms outside of the quarry.

Sixty (60) dump truck loads of DWTMDWTM spent lime is expected to arrive from the City of Toledo Collins Drinking Water Treatment Plant (WDWTP) per day. Trucks are anticipated to operate for nine (9) months per year, Monday through Friday, with some anticipated weather days. As the DWTMDWTM spent lime

will be blended with on-Site soil or other borrow sources, the blended material will consist of an approximate 67:33 percent mix of soil/~~DWTM~~DWTM~~lime~~, by volume. It is anticipated that the ~~DWTM~~DWTM ~~spent lime~~ consists of sixty (60) percent water and forty (40) percent solids. The Operator anticipates placement of approximately one-thousand (1,000) CY ~~cubic yards~~ of blended material per workday. As previously discussed, based on the depth to bedrock as reported by local bedrock maps, it is anticipated there is an adequate volume of overburden soil available on-site for the proposed operations.

3.6 Documentation of Work Activities

3.6.1 Material Documentation

As previously stated, the Operator has procured a contract with the Toledo Collins ~~WWTP~~ DWTP to receive the ~~DWTM~~DWTM~~spent lime~~. As part of the contract, the Toledo Collins ~~WWTP~~ DWTP tracks the number of truckloads of ~~DWTM~~DWTM ~~spent lime~~ removed from their lagoons. The trucks directly travel to the Site to deliver the ~~DWTM~~DWTM~~spent lime~~. Therefore, in order to document the beneficial use activities, the Operator plans to obtain truck count information on a monthly basis, which can be correlated to a beneficial use placement volume based on estimated truck volume.

Additionally, aerial surveys (via drone, field survey, or aerials) may be performed on an annual basis within the quarry to track placement volume. An initial survey of the prepared subgrade within the mid-bench (I.e., El. 552 feet) and the bottom bench (I.e., El. 496 feet) of the quarry will be performed prior to placement of Blended Fill. Therefore, annual surveys can be compared to calculate an annual in-place volume of Blended Fill placement.

As discussed previously, upon approval of this permit, Rocky Ridge will develop a performance monitoring plan to characterize the blended materials on a volume basis to ensure that blended materials being placed are meeting or exceeding the performance standards that were used in the initial blended material characterization.

3.6.2 In-Place Density Testing

To ensure Blended Fill is placed in a manner that achieves a well compacted and stable ~~low permeability per the geotechnical laboratory test results provided in Appendix G~~fill material, In-Place Density testing will be performed on a regular basis during Blended Fill placement activities. The geotechnical laboratory test results provided in Appendix ~~G~~F demonstrates that the Blended Fill can achieve a relative low permeability in the 10^{-6} to 10^{-5} cm/sec range, which is significantly lower than the calculated permeability of the local bedrock by the MODFLOW modeling. Therefore, a key objective of the compaction testing is to demonstrate the Blended Fill is being placed in a stable condition to facilitate the construction and filling activities.

Density testing is anticipated to be performed using a nuclear densitometer, to verify that the ~~determine if~~ placed Blended Fill is being placed at a minimum of ~~meets the~~ ninety-five (95) percent compaction specification and at to ~~the plus or minus~~ three percent (0 to ~~+/-~~ +3%) above its ~~of~~ optimum moisture required to meet the stability and compaction requirements of the Blended Fill, and to ensure the desired permeability rates lower than the local bedrock is achieved. In-place density and moisture will be compared to Standard Proctor laboratory test results (ASTM D698) of the Blended Fill (blended based on volume). Based on the results of the previously completed Standard Proctor testing performed on specimens considered to be representative of the Blended Fill that consists of 67% On-site soil and 33% DWTM (Hull Lab Sample # B16-1161) as provided in Appendix ~~G~~F-1, the maximum dry density to be used as the compaction control criteria will be 108.5 pcf and an optimum moisture content of 17.2%. (The range of acceptable moisture content will be 17.2 to 20.2%.)

If in-place density or moisture does not meet required specifications, the Fill area shall be re-worked to achieve passing compaction results (e.g., drying/wetting of Blended Material, additional comp active effort, etc.). Also, additional moisture-density (Proctor) curves may be necessary if the compaction control criteria being used (i.e., Hull Lab Sample # B16-1161) does not appear to be representative of the DWTM and/or soil material being placed. At a minimum, up to 4 additional Standard Proctor tests will be performed prior to commencing blending operations at various locations across the proposed borrow area to confirm the appropriate moisture-density control criteria are being used. Additionally, if blended Fill continually does not meet required compaction specifications, alternative blending techniques should be considered, and additional geotechnical testing may be performed.

At a minimum, o~~O~~ne passing in-place density test should be performed for every 5,000 CY ~~cubic yards~~ of Blended Fill placement. Based on the anticipated Blended Fill placement rate of approximately 1,000 CY per work day, this will result in a site visit by a soils technician of around one trip per week. It is the Operator's expectation that the soils technician will perform several tests that are spatially distributed across the work area, at the time of the site visit, which will essentially result in a higher frequency of tests compared to the minimum required of one test per 5,000 CY. The results of the in-place density testing shall be documented in Annual Reports.

3.6.3 Annual Reports

During the course of permitted construction activities per the IAWMP, the Operator will submit an Annual Report documentation general work activities. The Annual Report will contain geotechnical information (I.e., nuclear density testing results, additional geotechnical laboratory ~~permeability~~ testing results, etc.), placement volumes, truck count information for ~~spent lime~~~~DWTM~~DWTM, and an updated ~~aerial~~ survey of the previous year's work area~~quarry~~ at after the end of the year. Reports will be submitted by the Operator

in a timely manner to the Ohio EPA~~, allowing appropriate time after December 31st to complete the aerial survey.~~, but no later than March 31st.

3.6.4 Construction Completion Report

Upon completion of beneficially using ~~DWTM~~DWTM ~~spent lime~~ material within the quarry, a Construction Completion Report will be prepared to document the work activities. The Construction Completion Report will be submitted by the Operator and will include aspects of the Annual Report, including a final survey of the reclaimed quarry.

4.0 LITERATURE CITED

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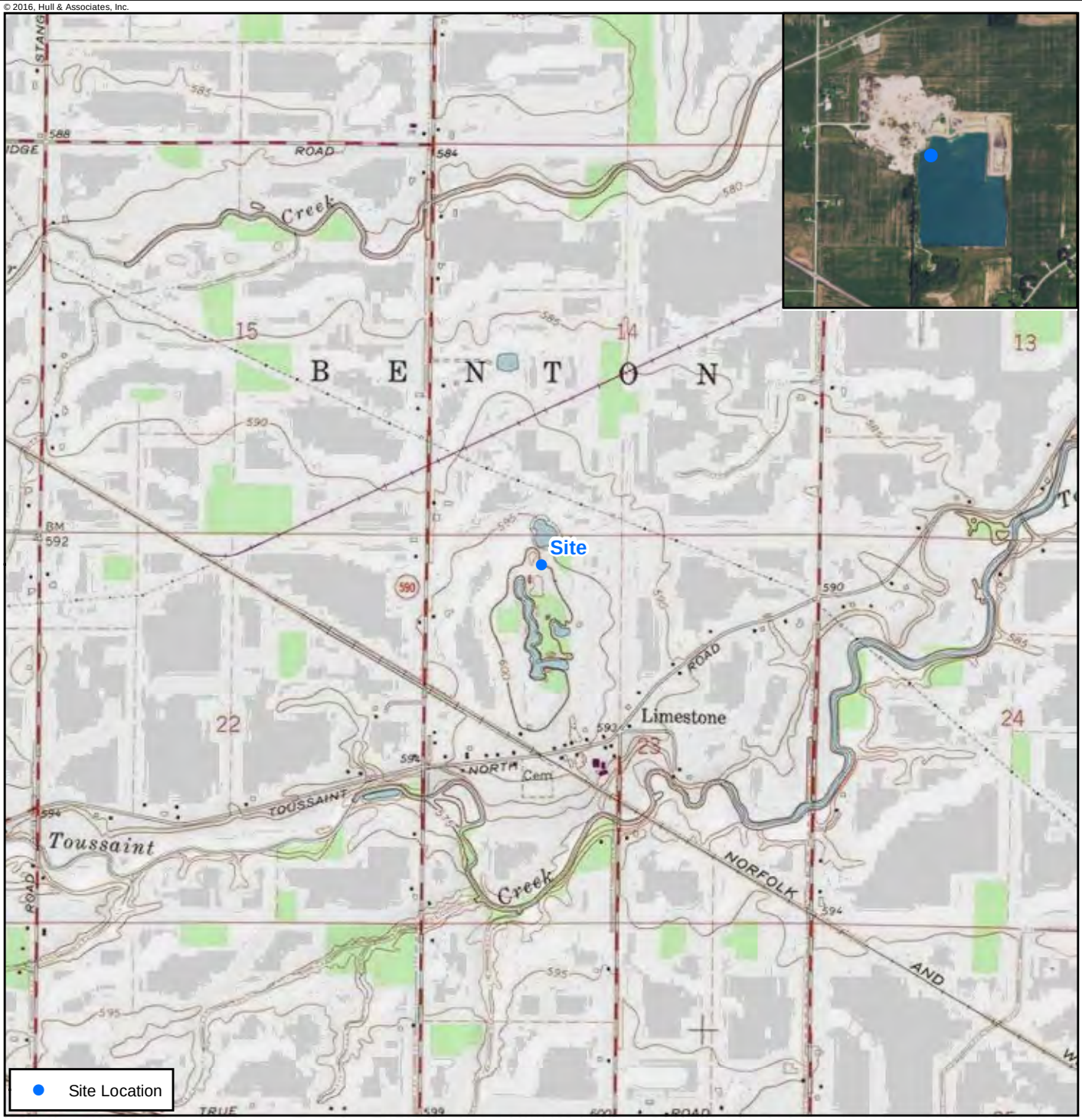
FIGURES



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0 500 1,000 2,000 Feet

1:24,000

Quad: Oak Harbor

Source: The topographic map was acquired through the USGS Topographic Map web service.

The aerial photo in the inset was acquired through the ESRI Imagery web service. Aerial photography dated 2015.

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Rocky Ridge Quarry

Site Location Map

14591 W. Toussaint North
Graytown, Ottawa County, Ohio

Date:

July 2016

File Name:
RCK001_01_Fig01_SiteLocMap.mxd

Edited: 7/19/2016 By: mopel

Figure

1

Produced using ArcGIS 10.3

APPENDIX A

Field Sampling and Analysis Memorandum

Memorandum

TO: John Taddonio, Rocky Ridge Development LLC

FROM: William Petruzzi and J Matthew Beil, Hull & Associates, Inc.

DATE: March 21, 2016

RE: Field Sampling and Analysis Plan for Collection of Spent Lime from the Lagoons at the City of Toledo Collins Park Water Treatment Plant; RCK001.100.0012

INTRODUCTION

This memorandum presents the Initial Characterization Study related to the proposed spent lime beneficial use project of the Rocky Ridge Quarry located at 14591 W. Toussaint North in Graytown, Ottawa County, Ohio. This Field Sample and Analysis Plan (FSAP) has been prepared to outline the methods of sample collection, analysis, and data evaluation. This memorandum was prepared to establish basic standard operating procedures (SOPs) and guidelines to assist Rocky Ridge Development, LLC (Rocky Ridge) with field sampling activities. Proper implementation of this FSAP is intended to allow the minimum necessary data to support preparation and submittal to Ohio EPA of an Integrated Alternative Waste Management Plan (IAWMP). Following review of the IAWMP, Ohio EPA may respond that additional data is required in order to approve the IAWMP.

SAMPLE AND FIELD DATA COLLECTION

Three composite samples of spent lime will be collected from each lagoon, for a total of nine (9) samples, as shown on Figure 1 in Attachment A. Summary tables for the proposed sampling is provided in Attachment B. Spent lime samples will be collected in accordance with Hull SOP F-3027 *Sampling With a Push-Tube Core Sampler*. Decontamination will be completed in accordance with Hull SOP F-1000.R1. Sample nomenclature is provided in Hull SOP F3041.R0. A chain of custody will be completed in accordance with Hull SOP F3014.RO. Applicable SOPs are included in Attachment C.
Depending on the method used, a Test Pit Field Log or Soil Boring Log, as provided in Attachment D, should be filled out for each sample documenting any change in physical appearance with depth. Photographs should be taken of each sample and the sample location, depth of sample, and other pertinent information noted for each photograph.

Each sample should be collected such that the entire profile of the existing spent lime can be discerned to the extent possible. Samples should be collected using a direct push method to drive a Lexan or stainless steel pipe (or equivalent) until refusal or base of the spent lime lagoon. The core will be pushed vertically from surface to bottom of lagoon. The core will be extracted and logged/photographed. The length of tubing obtained should take into account both the depth of the planned sediment core and the depth of any standing water under which the sediment core is to be taken. The top of the pipe should be capped and the sample tube removed until the bottom of the pipe can be capped immediately upon reaching the surface. The sample should be pushed or pulled out of the tube onto a clean surface or into new clean food grade 5-gallon buckets and homogenized using a decontaminated stainless steel spoon. Samples should be logged,

described, measured and photographed prior to placing into laboratory sample jars. Laboratory jars should be filled completely and lids tightly secured. Samples should be labeled according to Hull SOP F3041.R0.

For example:

For Lagoon D Sample Point #1 from 0.0 feet to 8.0 feet
Sample ID: RCK001:D-1:P000080

For Lagoon A Sample Point #2 from 0.0 feet to 4.5 feet
Sample ID: RCK001:A-2:P000045

Sufficient volume of spent lime must be collected both for the chemical and geotechnical analyses and to create the blends. At least two (2) 5-gallon buckets should be collected for each sample location, for a total of 6 buckets per lagoon. The material collected from each sample location shall be homogenized and placed in the analytical laboratory jars.

Additionally, a field/equipment blank should be collected halfway through the sampling. Distilled water should be used to fill the appropriate sample containers, using any decontaminated equipment, utensils, etc. that were used to collect/homogenize the spent lime samples. This sample ID should be: RCK001:EQB:DXXXXXX, with the sampling date (e.g., 031816) inserted after the "D".

One duplicate sample should be included halfway through the sampling event. The sample and duplicate sample should be collected from the same bucket after homogenizing the sample. This sample ID should follow the guidelines listed above, with a letter "A" inserted at the end of the depth interval (e.g., RCK001:A-2:P000045A).

A total of three samples will collected from each lagoon, with one lagoon sampling point having a duplicate, and analyzed for constituents identified on Table 1. Any deviations from this sampling approach should be documented in field notes or on the applicable sample collection field form.

Once the analytical laboratory sample jars are filled, leftover spent lime from each sample location should be composited *per lagoon* such that there is at least five (5) 5-gallon buckets per lagoon shipped to the geotechnical laboratory. Representative samples should be collected and homogenized prior to shipping to the geotechnical laboratory.

In addition to the lime characterization sampling, onsite soil samples need to be collected and sent to a geotechnical laboratory for analysis. Hull recommends that four (4) samples be collected of the onsite native clayey material that Rocky Ridge anticipates using as the soil component of the lime/soil blend. The sample locations should vary in both horizontal and vertical extents as to generally represent the materials that will be utilized in the blending process. Similar to the lime characterization, each native clayey soil sample should be logged, described, measured and photographed prior to placing into 5-gallon buckets for submittal to the laboratory.

These buckets should be labeled appropriately, and a Soils Lab chain of custody form, as provided in Appendix D, completed. Materials can be decontaminated at the lagoon with clean water and discarded as solid waste appropriately.

SAMPLE ANALYSIS

Samples will be placed on ice and shipped to ALS Laboratory in accordance with Hull SOP F1013.R0. The samples will be analyzed for the parameters listed on the tables provided in Attachment B. The 5-gallon buckets should be shipped to Hull's Geotechnical Laboratory.

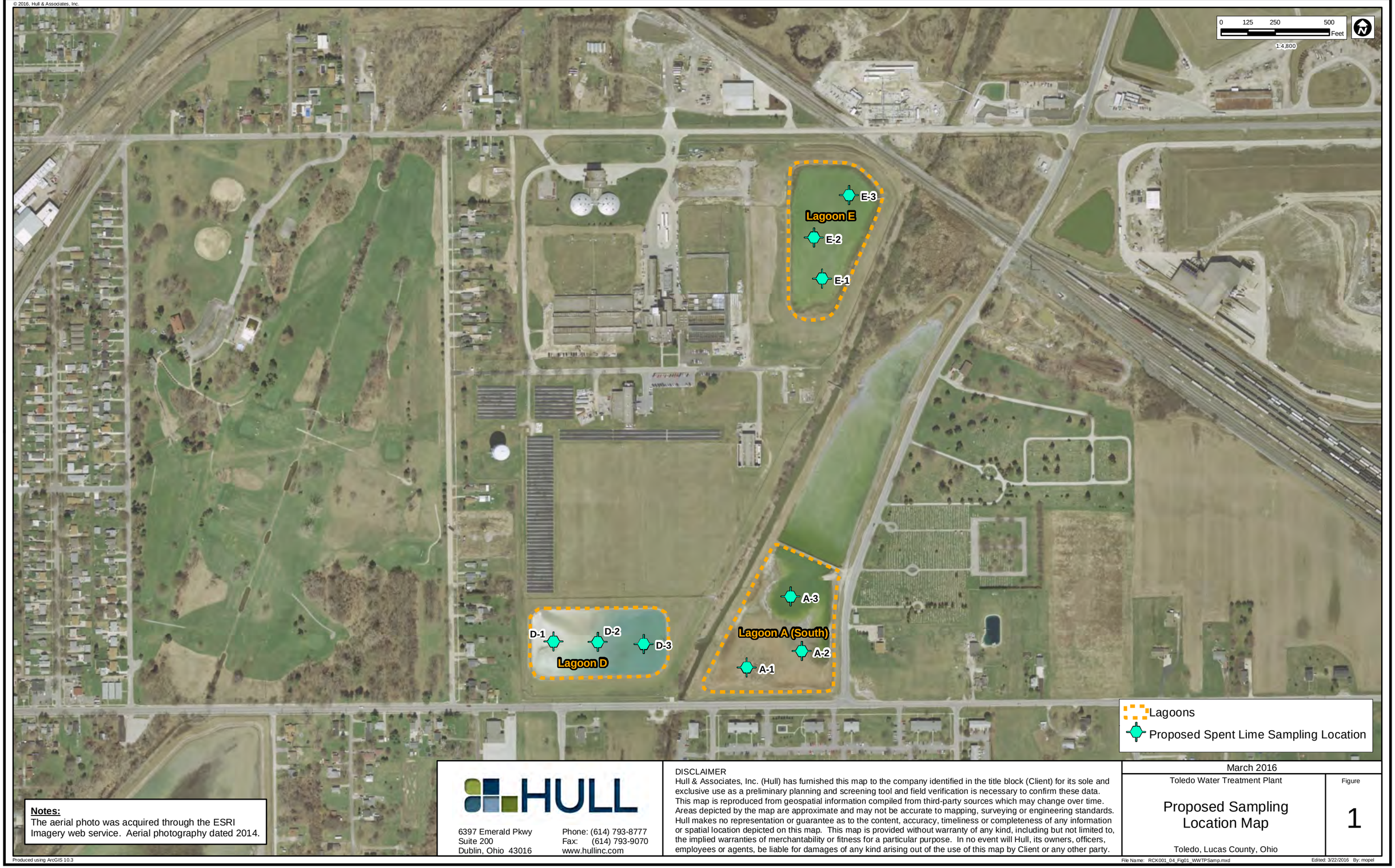
Data will be reported by the analytical laboratory at the lowest practical quantitation limit (PQL) that can reliably be achieved.

DATA EVALUATION AND REPORTING

Data will be reviewed for quality control/quality assurance. A table summarizing the data, basic statistics, and comparisons to applicable standards listed in the tables in Attachment B will be completed.

ATTACHMENT A

Figure



Notes:
The aerial photo was acquired through the ESRI Imagery web service. Aerial photography dated 2014.

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March 2016

Toledo Water Treatment Plant

Proposed Sampling Location Map

Toledo, Lucas County, Ohio

Figure 1

Produced using ArcGIS 10.3

File Name: RCK001_04_Fig01_WWTPSamp.mxd

Edited: 3/22/2016 By: mopel

ATTACHMENT B

Tables

Table 1
Summary of Totals and Geotechnical Analyses for Spent Lime

Chemical Sampling Parameter	Lab Chemical Sampling Method	# of Samples	Applicable Target Standards
pH	SW9045D	3 composite samples per lagoon (9 total samples); Chemical Only - 1 Duplicate Sample and 1 Field/Equipment Blank	1. Ohio Voluntary Action Program (VAP) - Residential Category 2. USEPA Region 9 Regional Screening Levels - Residential Category 3. Ohio Background Metals (Cox and Colvin)
Organic Carbon - Walkley-Black	TITRAMETRIC		
Chemical Oxygen Demand	E410.4 R2.0		
Biochemical Oxygen Demand	A5210B-97		
Chloride	A4500-Cl E-97		
Metals by ICP-MS Na, Mg, K	SW6020A		
Nitrogen, Total Kjeldahl	A4500-NH3 G-97		
Nitrogen, Total	Calculation		
Nitrogen, Total Inorganic	Calculation		
Nitrogen, Total Organic	Calculation		
Nitrogen, Nitrite	A4500-NO2 B		
Nitrogen, Nitrate	E353.2		
Nitrogen, Nitrate-Nitrite	E353.2		
Ammonia as Nitrogen	A4500-NH3 G-97		
Phosphorus, Total	E365.1 R2.0		
Phosphorus, Ortho-P (As P)	A4500-P E-97		
Priority Pollutant VOCs	SW8260B		
Priority Pollutant SVOCs	SW8270C		
PCBs	SW8082		
Priority Pollutant Pesticides	SW8081A		
Cyanide, Total	SW9012B		
Metals by ICP-MS	SW6020A		
Priority Pollutant Metals, Mercury by CVAA	SW7471A		
Geotechnical Sampling Parameter	**Geotechnical Sampling Method**		**Applicable Target Standards**
USCS: Particle Size	ASTM D2487 / ASTM D422		Not Applicable
Moisture Content by Mass	ASTM D2216		
Liquid Limit	ASTM D4318		
Plastic Limit			

Notes

1. Rocky Ridge will collect, pack, and ship 3 composite samples from each lagoon to the analytical laboratory. Each composite sample will characterize the entire depth of lime material. See Figure 2 for proposed sampling locations.

2. Rocky Ridge will collect five (5) buckets of the lime from each lagoon (15 total buckets) for use in preparing lime/soil blends for further testing. Each lagoon should be appropriately labeled (e.g., Lagoon D-1, Lagoon D-2, etc.)

3. Rocky Ridge will be responsible for all data collection, field reports and general documentation of field activities during the lime characterization.

Table 2
Summary of Totals and Geotechnical Analyses for Lime/Soil Blends

Chemical Sampling Parameter	Lab Chemical Sampling Method	# of Samples	Applicable Target Standards
pH	SW9045D	3 composite samples per blend (9 total samples)	1. Ohio Voluntary Action Program (VAP) - Residential Category 2. USEPA Region 9 Regional Screening Levels - Residential Category 3. Ohio Background Metals (Cox and Colvin)
Organic Carbon - Walkley-Black	TITRAMETRIC		
Chemical Oxygen Demand	E410.4 R2.0		
Biochemical Oxygen Demand	A5210B-97		
Chloride	A4500-Cl E-97		
Metals by ICP-MS Na, Mg, K	SW6020A		
Nitrogen, Total Kjeldahl	A4500-NH3 G-97		
Nitrogen, Total	Calculation		
Nitrogen, Total Inorganic	Calculation		
Nitrogen, Total Organic	Calculation		
Nitrogen, Nitrite	A4500-NO2 B		
Nitrogen, Nitrate	E353.2		
Nitrogen, Nitrate-Nitrite	E353.2		
Ammonia as Nitrogen	A4500-NH3 G-97		
Phosphorus, Total	E365.1 R2.0		
Phosphorus, Ortho-P (As P)	A4500-P E-97		
Priority Pollutant VOCs	SW8260B		
Priority Pollutant SVOCs	SW8270C		
PCBs	SW8082		
Priority Pollutant Pesticides	SW8081A		
Cyanide, Total	SW9012B		
Metals by ICP-MS	SW6020A		
Priority Pollutant Metals, Mercury by CVAA	SW7471A		
Geotechnical Sampling Parameter	**Geotechnical Sampling Method**		**Applicable Target Standards**
Standard Proctor	ASTM D4318		Not Applicable
Specific Gravity by Water Pycnometer	ASTM D854		
Hydraulic Conductivity by Flex Wall Permeability	ASTM D5084		

Notes

1. Rocky Ridge will collect 4 representative samples of the native soils (5 buckets for each representative sample) that will be used for lime/soil blending. Three (3) blends of lime/soil will be made: 33/66, 50/50, and 66/33.

2. Blends will be prepared by the geotechnical laboratory and samples shipped to the chemical laboratory.

3. Rocky Ridge will be responsible for all data collection, field reports and general documentation of field activities during the lime characterization.

Table 3
Summary of Synthetic Precipitation Leaching Procedure (SPLP) Analyses for Lime/Soil Blends

SPLP Analysis for Blends[1]			
Chemical Sampling Parameter	**Lab Chemical Sampling Method**	**# of Samples**	**Applicable Target Standards**
pH (laboratory)	SW9040C	Lagoons - up to 3 composite samples per lagoon if totals results exceed MDL (up to 9 total lagoon SPLP samples) Blends - 33/66 Blend - up to 3 composite samples if totals results exceed MDL 50/50 Blend - up to 3 composite samples if totals results exceed MDL 66/33 Blend - up to 3 composite samples if totals results exceed MDL (up to 9 total blend SPLP samples)	OAC 3745-1 and 3745-2 Lake Erie Basin Aquatic Life and Human Health Tier I Criteria, Tier II Values and Screening Levels
Organic Carbon, Total	A5310C-00		
Chemical Oxygen Demand	E410.4 R2.0		
Biochemical Oxygen Demand	A5210B-01		
Chloride	A4500-Cl E-97		
Metals by ICP-MS SPLP/TCLP Na, Mg, K	SW6020A		
Nitrogen, Total Kjeldahl	A4500-NH3 G-97		
Nitrogen, Total	Calculation		
Nitrogen, Total Inorganic	Calculation		
Nitrogen, Total Organic	Calculation		
Nitrogen, Nitrite	A4500-NO2 B		
Nitrogen, Nitrate	E353.2 R2.0		
Nitrogen, Nitrate-Nitrite	E353.2 R2.0		
Ammonia as Nitrogen	A4500-NH3 G-97		
Phosphorus, Total	E365.1 R2.0		
Phosphorus, Ortho-P (As P)	A4500-P E-99		
Volatile Organic Compounds - Aqueous	SW8260B		
SPLP/TCLP Priority Pollutant VOCs			
Semi-Volatile Organic Compounds	SW8270C		
SPLP/TCLP Priority Pollutant SVOCs			
PCBs	SW8082		
SPLP/TCLP			
Pesticides	SW8081A		
SPLP/TCLP Priority Pollutant Pesticides			
Cyanide, Total	SW9012B		
SPLP/TCLP			
Metals by ICP-MS	SW6020A		
SPLP/TCLP Priority Pollutant Metals			
Mercury by CVAA	SW7470A		
SPLP Leach for Wet Chemistry	SW1311		
SPLP Leach for Metals	SW1311		
SPLP Leach for Volatiles	SW1311		
SPLP Leach for Semi-Volatiles	SW1311		

Notes

1. SPLP analysis will only be completed if a total result for that parameter exceeds the Method Detection Limit (MDL). Analytes that are non-detect will not be run for SPLP.

2. Rocky Ridge will be responsible for all data collection, field reports and general documentation of field activities during the lime characterization.

ATTACHMENT C

Standard Operating Procedures

HULL & ASSOCIATES, INC.
STANDARD OPERATING PROCEDURE

Title: Environmental Sample Nomenclature	
Effective Date: 1/17/14	**Document Number:** HULLSOP.F3041.R0

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Signature:  Date: 1/17/14

REVISION HISTORY

The table below summarizes changes to this document over time. The most recent version is presented in the top row of the table. Previous versions of the document (if any) are maintained in the archive portion of the Hull Standard Operating Procedure (SOP) library.

History	Effective Date
HULLSOP.F3041.R0 created in January 2014. This document updates a December 9, 2002 Hull memorandum issued by W. Lance Turley to Hull Field Personnel outlining sample nomenclature (Hull Document No. 1000.200.0545).	January 17, 2014

HULLSOP.F3041.R0
ENVIRONMENTAL SAMPLE NOMENCLATURE

1.0 Purpose

This Hull & Associates, Inc. (Hull) Standard Operating Procedure (SOP) describes the nomenclature format to standardize the naming of samples collected during field work.

2.0 Documentation

Sample labels, chain of custody forms and field forms will be filled out using the proper nomenclature, as described in this SOP.

3.0 Special Notes

1. Please ensure the appropriate field forms are filled out to completion to supplement information contained within the sample name. Current field forms are maintained on Hull's intranet. Field forms include, but are not limited to, soil and well boring logs, groundwater sampling field data sheets, air sampling field data sheets and excavation log forms.

2. All sample locations are to be accurately documented on scaled drawings and/or recorded with Global Positioning System (GPS) or other applicable survey method, as dictated by project requirements.

3. In order to avoid entry errors at the laboratory during the sample login process, it is very important to write legibly in capital letters and exaggerate commonly mistaken letters and numbers. Common transcription errors occur from the following characters:

    - "S" and "5"
    - "D" and "O" and "0"
    - "I" and "1"
    - "4" and "9"
    - "2" and "Z"
    - "V" and "U"

4. Some state and federal regulatory programs have specific requirements for sample nomenclature that may need to be followed. The Project Manager should specify if other requirements should be followed instead of, or in addition to, the requirements outlined herein.

4.0 Nomenclature Format

Hull's sample numbering system consists of three distinct input fields separated by colons. These fields are expressed in the form of:

PROJECT_NUMBER:SAMPLE-LOCATION:SAMPLE_TYPE_&_ID

NOTE: Do not put any blank spaces or punctuation other than a hyphen in the sample locations and the required colons separating fields (see examples in subsequent sections).

Project Number

The first field is Hull's project number. The project number will always be 6 characters. Generally, Hull's project numbers are 3 letters followed by 3 numbers (e.g., HAI003).

Sample Location

The second field is the primary sample location identifier (e.g., MW-1, SB-1, SED-3, etc.). The sample location field should be kept to a reasonable length (i.e., 4-8 characters). These characters may consist of letters, numbers, and hyphens. Hull's sample numbers should always include the hyphen (i.e., MW-6, SB-4, etc.). Sample nomenclature within each project must be consistent in order for Hull's data management program (Envirodata) to properly handle the data.

Sample Type & ID

The third field identifies the sample type or matrix and further describes the sample (e.g., sampling date, depth, or sequence). Duplicate samples are also identified in this field.

Sample Matrix

The first character of this field will always identify the matrix. Specifically:

AA – Ambient Air;
D – Sediment;
G – Groundwater;
IA – Indoor Air
P – Product;
S – Soil;
SG – Soil Gas
SS – Subslab Vapor
W – Water (other than groundwater);
X – Concrete; and
Z – all other matrices.

Six Digit Number for Date, Depth or Sequence

A six-digit number will immediately follow the sample matrix character and will indicate the sampling date, depth, or sequence (see the examples in subsequent sections).

- Sample dates are expressed in the form of mm/dd/yy. For example, February 6, 2013 would be indicated by 020613.

- Sample depth intervals are described as a pair of three digit numbers representing the starting and ending depths. The last digit of each depth is reserved for tenths. For example, a sample collected from 2.0 to 3.2 feet would be represented as 020032 (02.0 and 03.2). If samples are collected from greater than 100 feet, a note will be made on the chain of custody, the tenths will be dropped, and the depth intervals will be reported in whole feet.

- Sample depths will be referenced from the ground surface. If samples are collected from a constructed surface such as a floor slab or asphalt drive area, sample depths should be referenced from the constructed surface unless directed otherwise by the Project Manager.

- Sequential-based sampling will be identified by starting with 000001 for the first sample and increased by 1 for each subsequent sample collected. Note: depth- or date-based sample nomenclatures are preferred for most sample numbering systems.

Duplicate Samples

For duplicate samples, an "A" will be placed immediately after the six-digit number. For example, a duplicate sample collected on February 6, 2013 would be 020613A.

5.0 Nomenclature Examples

Examples of valid sample identification numbers for some of Hull's routine sampling activities are described below.

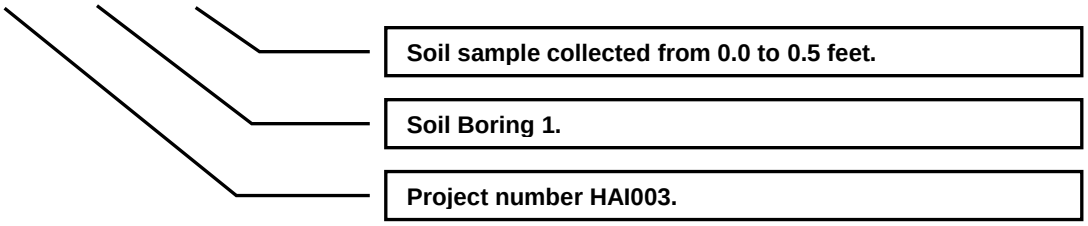
5.1 Soil Samples

The sample type for soil samples is "S" and will be followed by a six digit number to indicate the depth interval the sample was collected from.

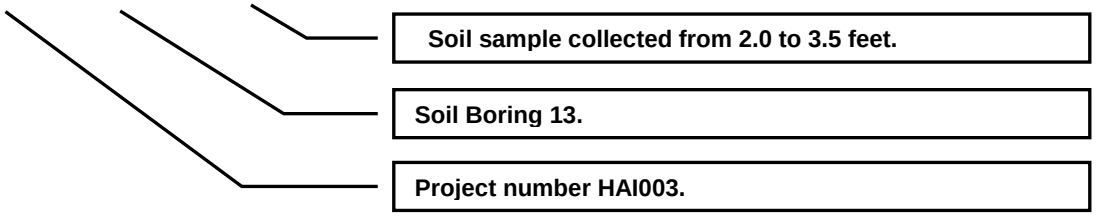
In general, all soil samples will follow this format regardless of method of collection (i.e., split spoons, hand auger, direct push, etc.). Please note that when soil samples are collected from a boring that will be converted into a monitoring well, the sample location will identify the monitoring well location instead of the soil boring location.

Some examples of nomenclature for soil samples follow:

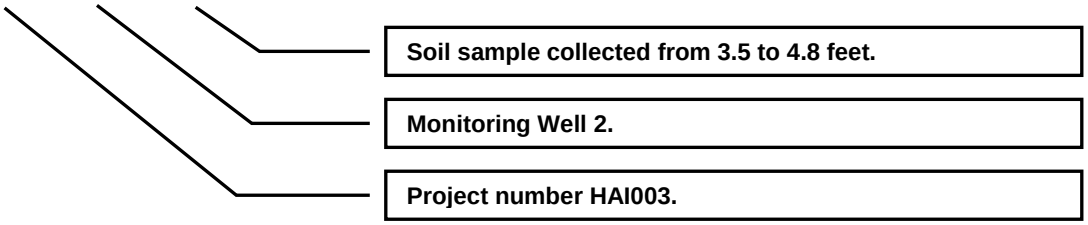
HAI003:SB-1:S000005



HAI003:SB-13:S020035



HAI003:MW-2:S035048

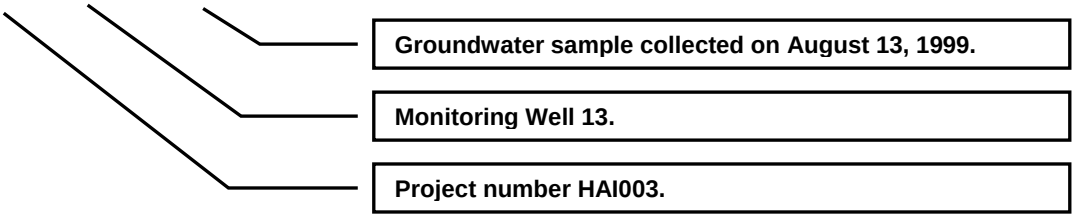


5.2 Water Samples

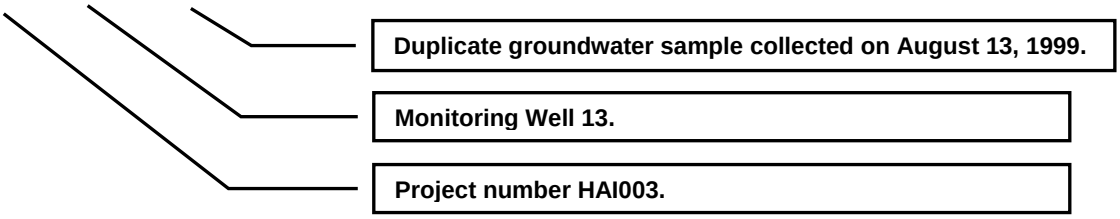
The sample type for water samples will be either "G" for groundwater or "W" for other waters (surface water, stormwater, water in an excavation, field blanks, trip blanks, etc.). The sample type and ID will also include a six-digit number to indicate the date of sample collection.

Some examples of nomenclature for water samples follow:

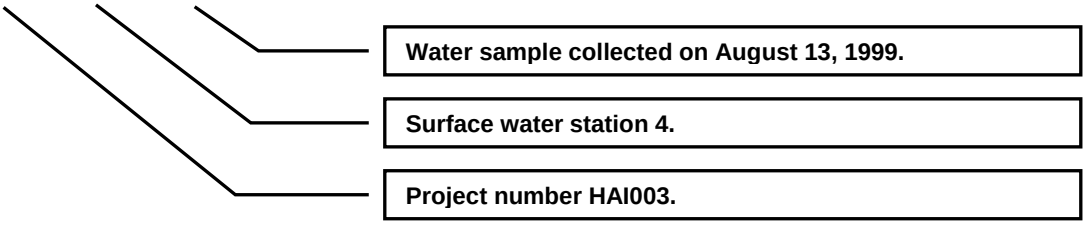
HAI003:MW-13:G081399



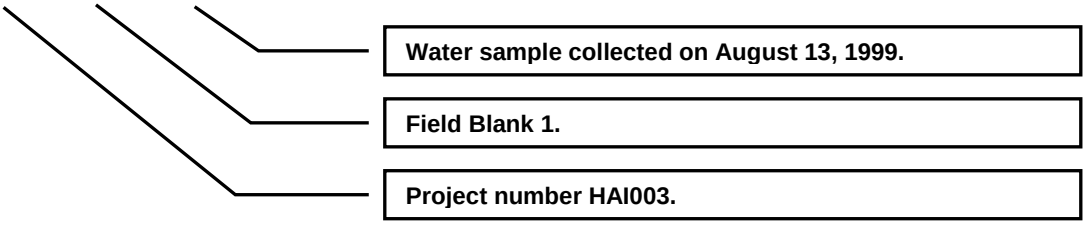
HAI003:MW-13:G081399A



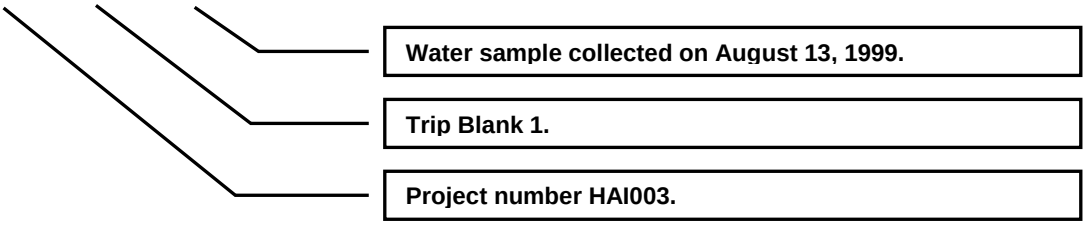
HAI003:SW-4:W081399



HAI003:FB-1:W081399



HAI003:TB-1:W081399

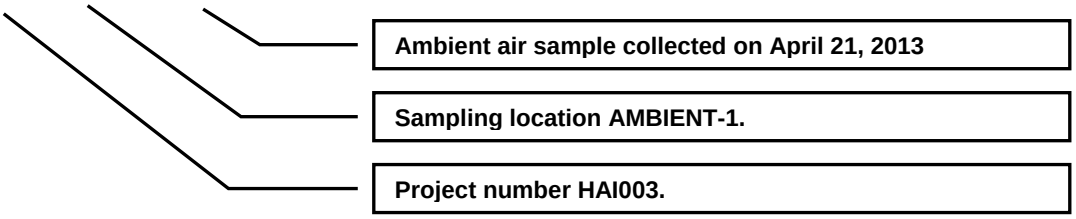


5.3 Air Samples

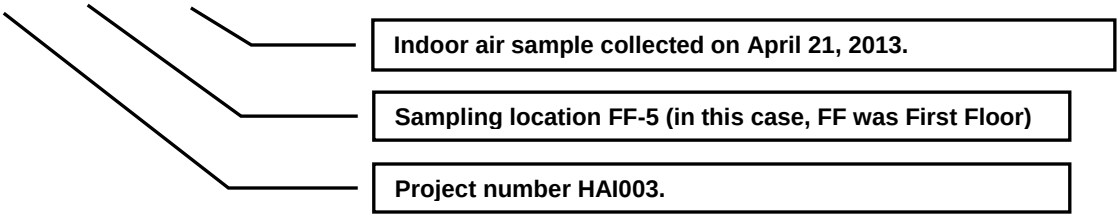
The sample type for air samples will be either “AA” for ambient air, “SG” for soil gas or “SS” for sub-slab vapor. The sample type and ID will also include a six-digit number to indicate the date of sample collection.

Some examples of nomenclature for air samples follow:

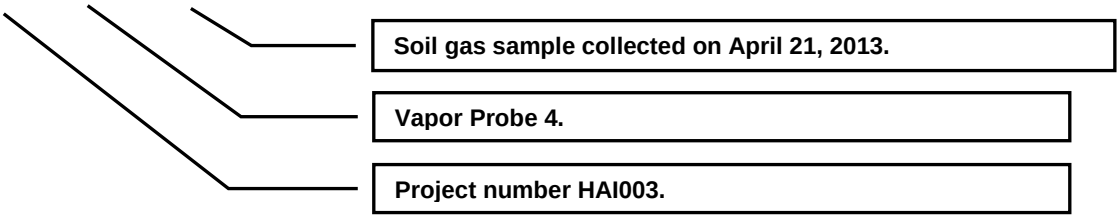
HAI003:AMBIENT-1:AA042113



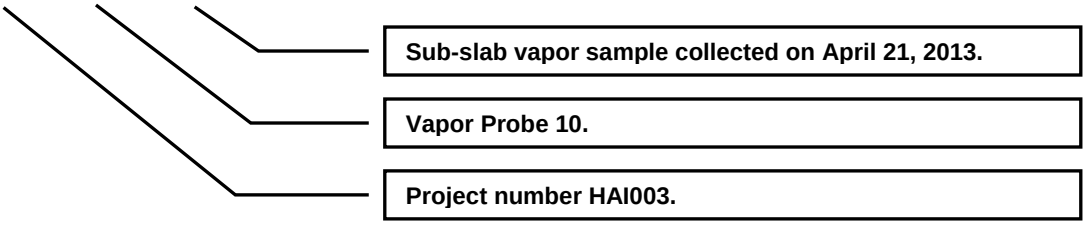
HAI003:FF-5:IA042113



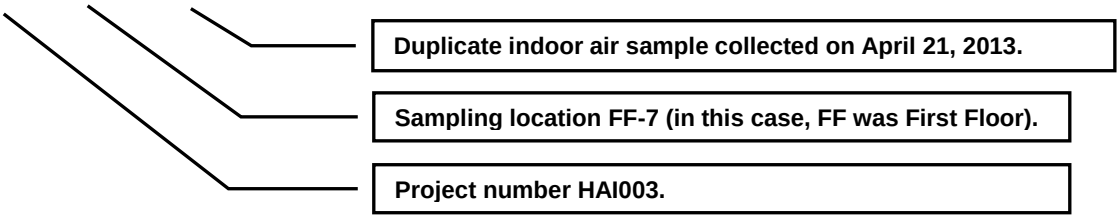
HAI003:VP-4:SG042113



HAI003:VP-10:SS042113



HAI003:FF-7:IA042113A



5.4 Remediation System Samples

The following is a list of sample location codes for the most common sampling points on remediation systems operated by Hull.

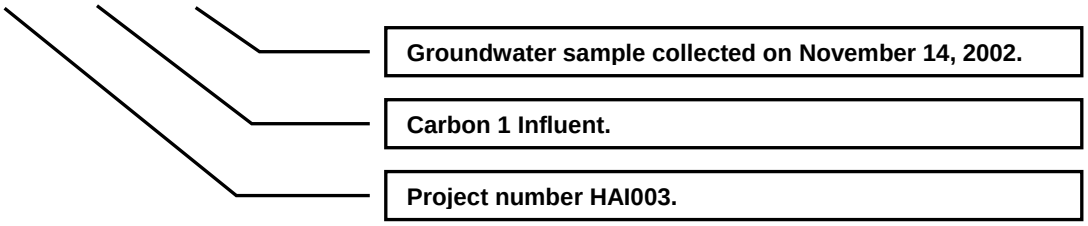
Carbon canisters/vessels/etc.
C1I = carbon 1 influent (first carbon unit in series)
C1E = carbon 1 effluent (carbon 2 influent is same carbon 1 effluent, etc)
C2E = carbon 2 effluent
CE = final carbon discharge

Air Strippers
ASI = air stripper influent
ASE = air stripper effluent

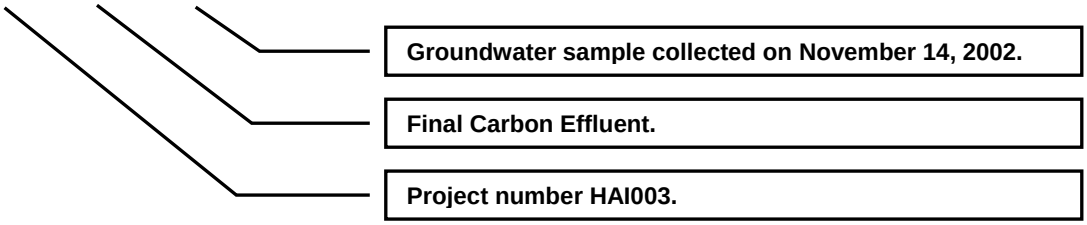
Misc.
OWSE = oil water separator effluent
SVE = soil vapor extraction (CATOX and RETOX influent as well)
CTX = CATOX Effluent
RTX = RETOX Effluent

Some examples of nomenclature for remediation system samples follow:

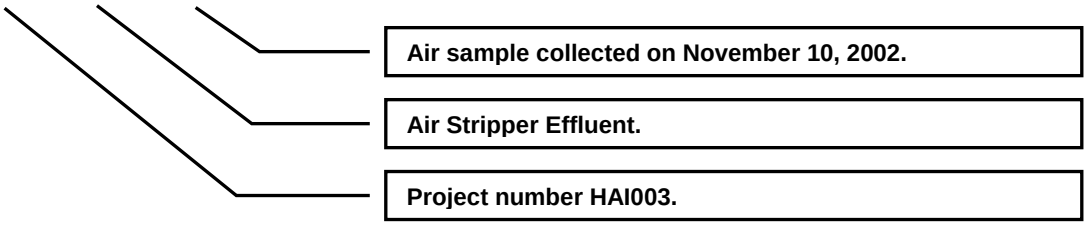
HAI003:C1-I:G111402



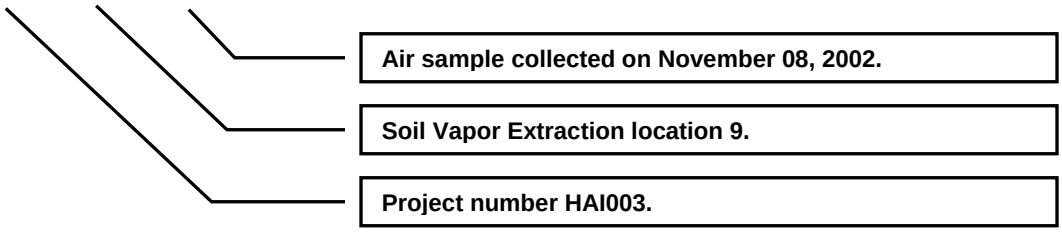
HAI003:CE:G111402



HAI003:ASE:A111002



HAI003:SVE-9:A110802



5.5 Remedial Excavation Confirmation Sampling

Remedial excavations are variable in size, shape, extent and complexity. The discussion below provides a framework for remedial excavation confirmation sample nomenclature. Portions of the nomenclature framework are flexible (e.g., names of remedial areas). The Project Manager must designate the proper nomenclature to be used, as based on the framework below, prior to mobilization. The selected nomenclature should be consistent throughout implementation of the remedy. Field personnel need to accurately document the extent of every excavation and the location of confirmatory samples through appropriate scaled drawings or survey methods as specified by the project requirements.

Remedial excavation sample names will include the following:

- Project number;
- Remedial area as appropriate for the project scope;
- Sample location within the remedial area expressed as cardinal direction with sequential numbers. In addition, letters will be used to indicate excavation lateral limit iterations;
- Sample type; and
- Sample depth.

The remedial area should identify the location of the excavation with a label appropriate for the type of project. Examples of commonly-used excavation location designations are as follows:

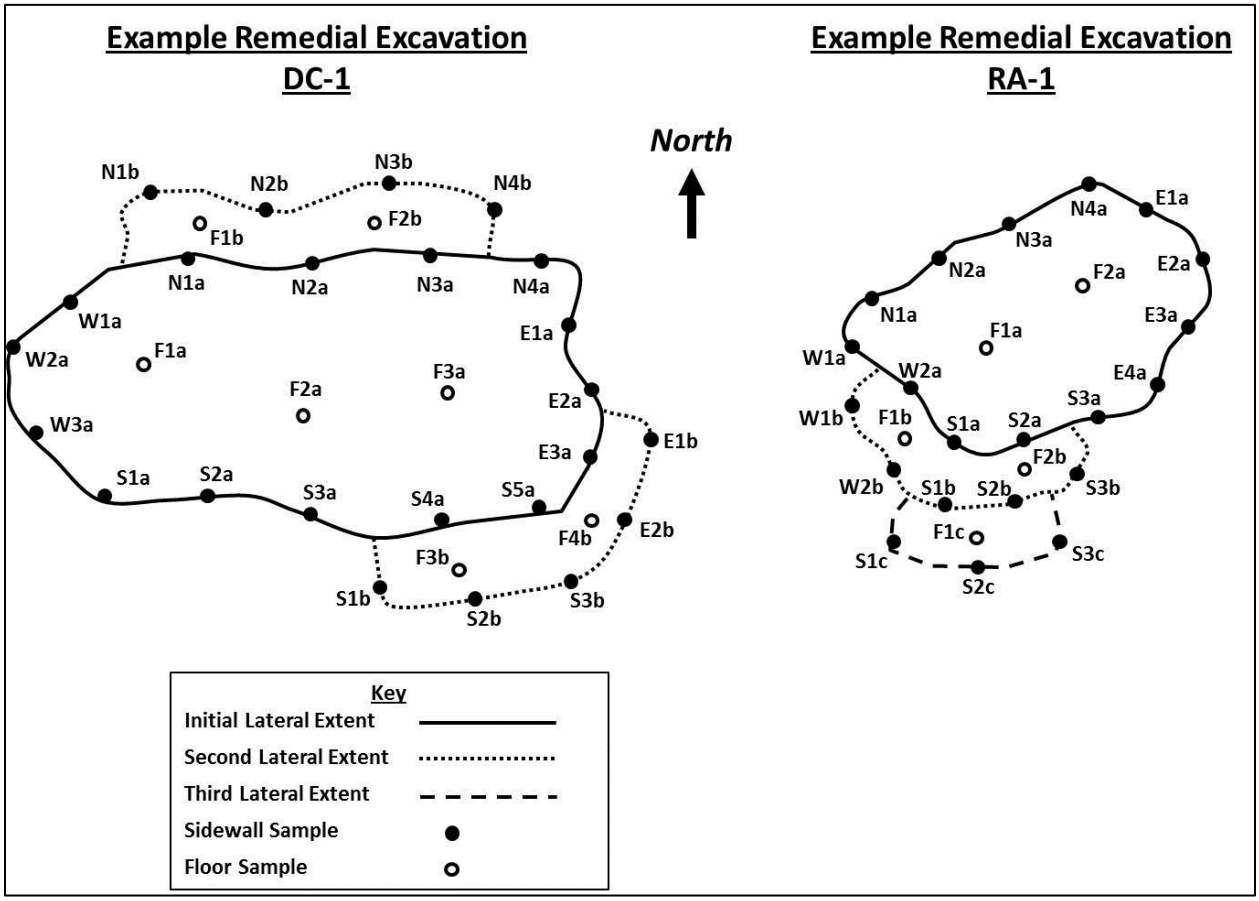
RA-1	Remedial Area #1
IA-1	Identified Area #1
AOC-1	Area of Concern #1
DC-1	Direct Contact Exceedance Area #1
SIA-1	Soil-to-Indoor Air Exceedance Area #1

In general, samples will be collected from the base/floor of the excavation and side walls/edges of the excavation. Samples from the base/floor of the excavation will be denoted as “F” to indicate a floor sample and will be numbered sequentially (F1, F2, etc.). In addition, a letter will follow the numerical sample designation to indicate the excavation limit iteration. For example, samples collected from within the initial lateral extent of the excavation will all be labeled with “a” (F1a, F2a, etc.). In the event that the lateral limits are extended through subsequent excavation iterations, samples collected from within the new limits will be labeled sequentially with “b” for samples within the second lateral extent, “c” for samples within the third lateral extent, etc.

The samples from the side walls/edges of the excavation will be denoted by the cardinal direction of the side wall (i.e. “N”, “S”, “E”, “W”), followed by a sequential number for each sample along the sidewall. Samples along the northern and southern walls will be numbered sequentially moving west to east. Samples along the western and eastern walls will be numbered sequentially moving north to south. In addition, a letter will follow the numerical sample designation to indicate the excavation limit iteration. For example, samples collected

from the initial lateral extent of the excavation will all be labeled with “a” (N1a, N2a, etc.). In the event that the lateral limits are extended through subsequent excavation iterations, samples collected from the new limits will be labeled sequentially with “b” for samples from the second lateral limit, “c” for samples from the third lateral limit, etc.

The remedial excavation numbering system is illustrated in the figure below, with example sample numbers following.



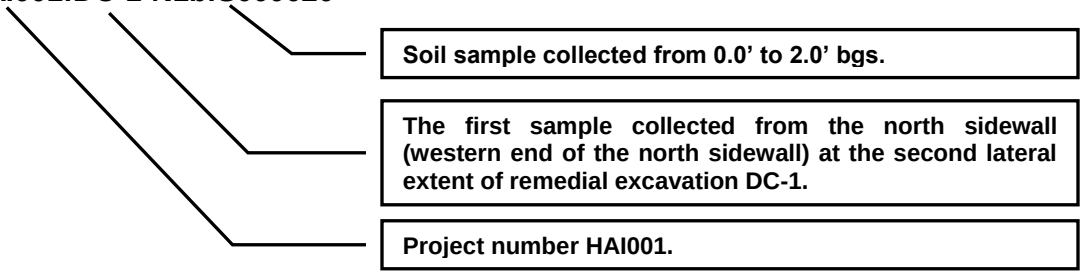
HAI001:DC-1-N1a:S000020

Soil sample collected from 0.0’ to 2.0’ bgs.

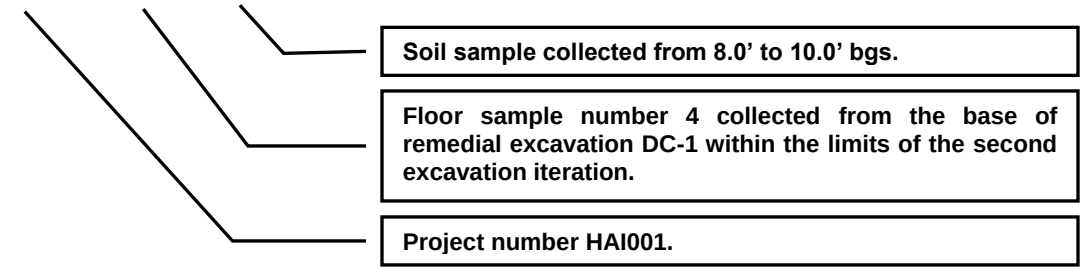
The first sample collected from the north sidewall (western end of the north sidewall) at the initial lateral extent of remedial excavation DC-1.

Project number HAI001.

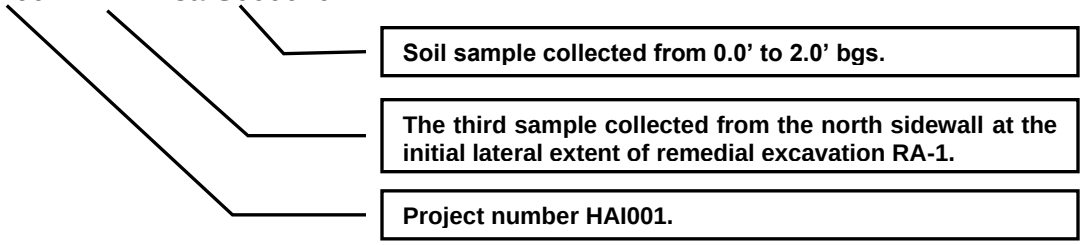
HAI001:DC-1-N1b:S000020



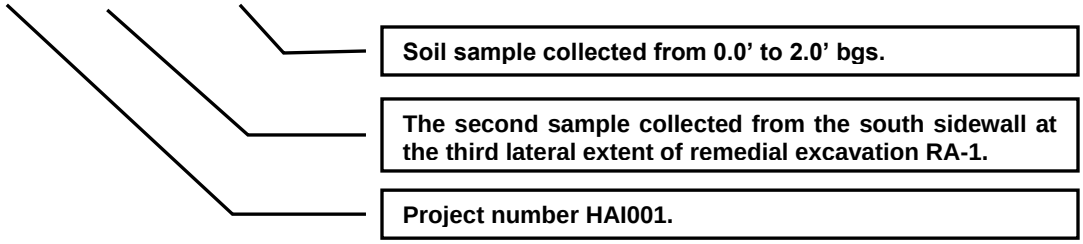
HAI001:DC-1-F4b:S080100



HAI001:RA-1-N3a:S000020



HAI001:RA-1-S2c:S000020



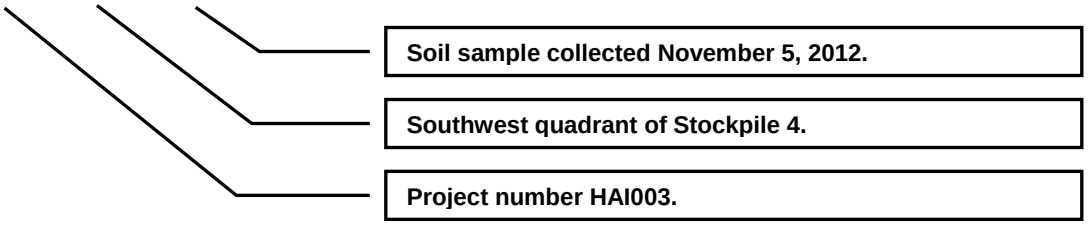
5.6 Stockpile Sampling

The approach for collecting stockpile samples will be dictated by stockpile volume, purpose of the sampling and project-specific requirements. Stockpile sample nomenclature will be dictated by the sampling approach. The Project Manager must designate the proper sampling approach and associated nomenclature to be used prior to mobilization.

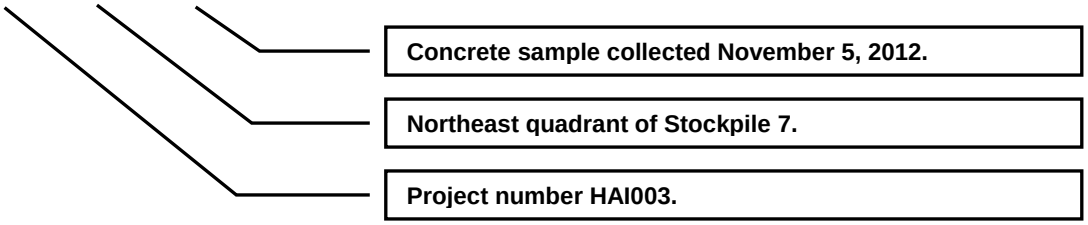
On many projects, stockpiles are characterized by dividing the pile into quarters. Samples are then collected from each quarter using discrete and/or composite sampling methods as required by the project. When using the "quartering approach", sample locations will identify the stockpile number and the quarter from which the sample was collected based on cardinal direction. The six digit number in the sample ID field will identify the sample collection date.

Examples of stockpile sample identification numbers using the "quartering approach" follow:

HAI003:SP-4SW:S110512



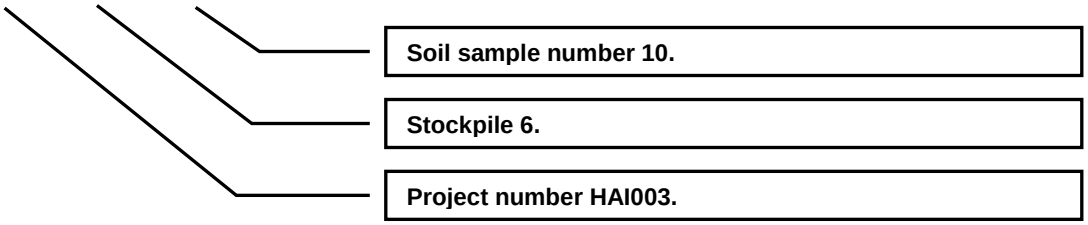
HAI003:SP-7NE:X110512



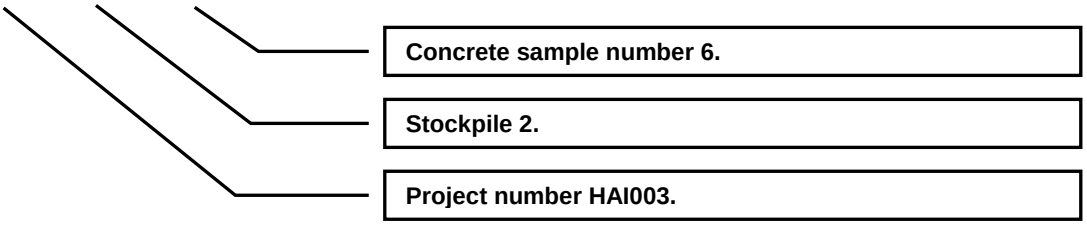
Stockpile samples may also be numbered sequentially if the quartering approach is not used. In these cases, the sample location will identify the stockpile number. The sample ID field will indicate a sequentially-numbered sample designation. The sample ID for each stockpile will begin with 000001 and be sequentially increased thereafter for each sample collected.

Examples of stockpile sample identification numbers using the sequential numbering approach follow:

HAI003:SP-6:S000010



HAI003:SP-2:X000006

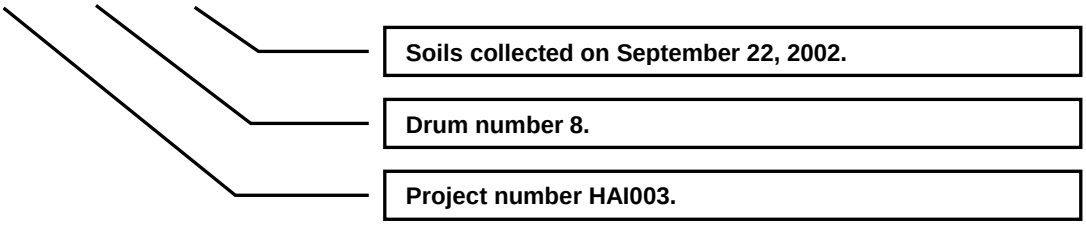


5.7 Drum Sampling

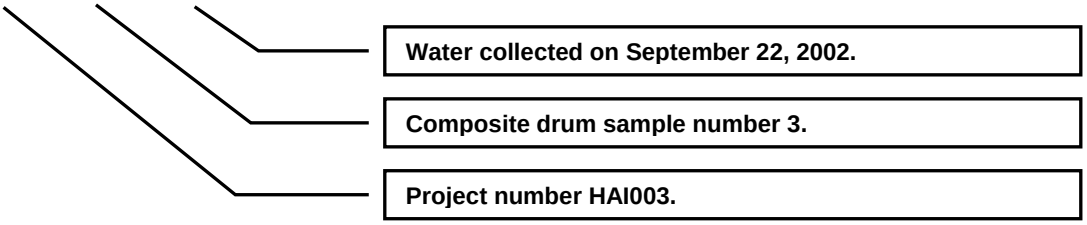
Drum samples may be either discrete or composite samples. Regardless of whether discrete or composite samples will be collected, each drum sample at a site/property will be sequentially numbered. For discrete samples, the sample location will be the drum number (i.e., D-1, D-2, D-3, etc.). Composite drum samples will be identified beginning with DC-1 and sequentially numbered thereafter. It is the sampler's responsibility to record the individual drum numbers that make up each composite sample. In all cases the Sample ID for each sample will be the date of sample collection.

Examples of drum sample designations follow:

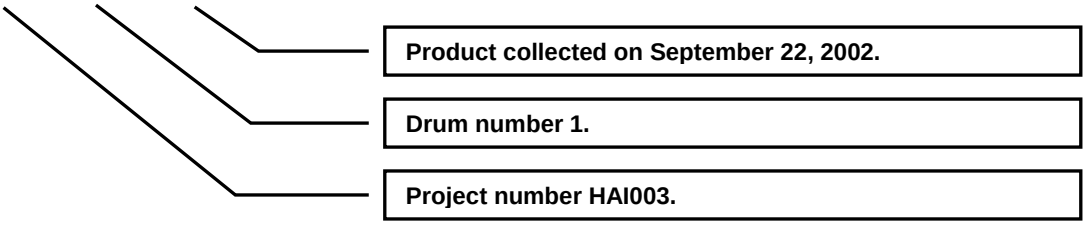
HAI003:D-8:S092202



HAI003:DC-3:W092202



HAI003:D-1:P092202

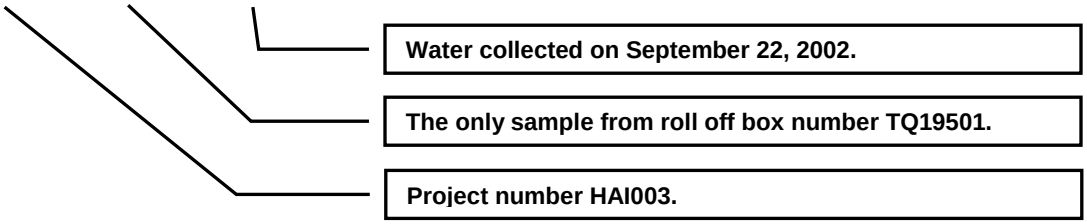


5.8 Roll-off Box Sampling

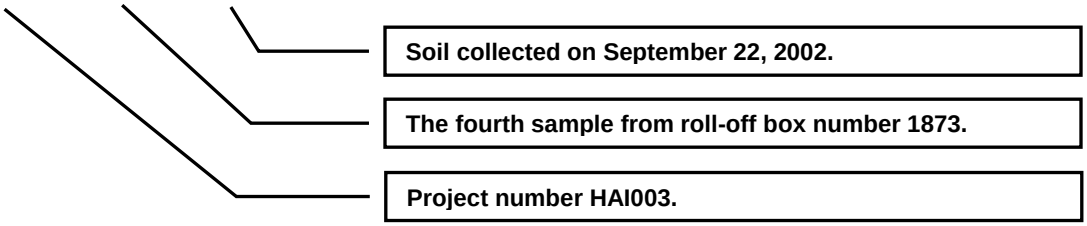
Roll-off box samples are typically collected as composite samples, but in some cases may be collected as discrete samples from multiple points within the roll-off box. If multiple samples are being collected from a roll-off box, after the roll-off box number a hyphen and the sample number will be included in the sample location field (i.e., roll-off box number 18405 with 4 samples will be 18405-1, 18405-2, 18405-3 and 18405-4). If only one sample is being collected from the roll-off box, it is not necessary to include a hyphen and the sample number. The sample type will be either S or W. In all cases the Sample ID for each sample will be the date of sample collection.

Examples of roll-off box sample designations follow:

HAI003:TQ19501:W092202



HAI003:1873-4:S092202



6.0 Standards and References

Turley, W. Lance, *Memorandum Re: Environmental Sampling Nomenclature and Chain-of-Custody Procedures*, Hull & Associates, Inc. - Document No. 1000.200.0545, December 9, 2002.

HULL & ASSOCIATES, INC.
STANDARD OPERATING PROCEDURE

Title: Decontamination of Field Equipment	
Effective Date: 1/22/14	**Document Number: HULLSOP.F1000.R1**
Author	
Name: Monica Williamson Title: Sr. Scientist  Signature: Date: 1/22/14	
Approvals	
Name: Bill Dennis Title: Sr. Project Manager  Signature: Date: 1/22/14	

REVISION HISTORY

The table below summarizes changes to this document over time. The most recent version is presented in the top row of the table. Previous versions of the document (if any) are maintained in the archive portion of the Hull SOP library.

History	Effective Date
HULLSOP.F1000.R1 – created in January 2014 to update the September 2013 version. Modifications to the previous version include: • Pre-installation decontamination of monitoring well materials; and • Specifying that potable water may be used in place of distilled water for final rinsing of all decontaminated equipment.	January 22, 2014
HULLSOP.F1000.R0 – created in September 2013 as part of overall reorganization of Hull's SOP program. While this version supercedes F1000-12REV, the content is substantially equivalent to the 2012 version; only minor editorial modifications were made for additional clarity, and the document name was changed for consistency with Hull's updated SOP nomenclature.	September 10, 2013
F1000-12REV – created in September 2012 to replace 1999 version; superceded in September 2013.	September 2012
F1000-99REV – created in 1999; superceded in September 2012.	1999 (month not recorded)

HULLSOP.F1000.R1
DECONTAMINATION OF FIELD EQUIPMENT

1.0 Purpose

This Hull & Associates, Inc. (Hull) Standard Operating Procedure (SOP) describes the minimum procedures that will be followed when decontaminating field equipment. Equipment may include soil sampling devices, bailers, trowels, shovels, hand augers, drilling rigs, or any other type of reusable equipment used during field investigations.

Decontamination will be performed as both a quality assurance measure and as a safety precaution. Specifically, the purpose for these decontamination procedures is to minimize the potential for cross contamination between sampling locations and prevent potentially contaminated materials from being transported off-site.

2.0 Equipment and Materials

Equipment and materials required for decontamination of field equipment may include, but will not necessarily be limited to:

- power-washer or high-pressure steam cleaner;
- cleaning fluids: non-phosphatic soap and/or detergents, potable water, distilled/deionized water; dilute nitric acid (as applicable);
- shovels and brushes;
- paper towels;
- disposable gloves;
- waste storage containers: plastic bags, drums, boxes;
- cleaning containers: plastic buckets, etc.;
- plastic sheeting; and
- personal protective equipment.

3.0 General

A. All decontamination will be performed under the assumption that the equipment is contaminated. At a minimum, clean, unused vinyl or nitrile gloves will be worn during all decontamination activities. Additional personal protective equipment will be worn as required by the site-specific health and safety plan.

B. An adequate supply of all decontamination equipment and materials will be available on site.

C. All equipment will be decontaminated before leaving the site.

D. Decontamination of vehicles or large equipment will generally be conducted in a designated area. Smaller equipment may be decontaminated near the sampling location.

E. All decontamination materials that cannot be re-used will be properly packaged for disposal based on the nature of contamination.

4.0 Procedures

The following sections present the minimum procedures that will be used to decontaminate field equipment. If different or more extensive procedures are required, they will be pre-approved by the Project Manager and/or Quality Assurance Officer, as appropriate.

4.1 Drilling Rig and Associated Equipment

A. Equipment coming in contact with potential contamination, both as part of subsurface equipment advancement and aboveground contact with drilling fluids, extracted soils, ground water, drill rig lubricants and fuels, etc., will be decontaminated prior to use. At the discretion of the Project Manager, decontamination of the entire drilling rig may be required due to the adherence of foreign substances as a result of operations, transportation from off-site, or travel between soil boring locations.

B. A high-pressure steam cleaner will be used to clean the inside and outside of drilling equipment that will potentially come into contact with test samples. Decontamination of sampling equipment (e.g., split-spoon samplers) is described in section 4.2.

C. All liquid and solid material produced from this operation will be collected and properly contained until such time as it can be properly disposed.

D. The date, time, and decontamination procedure used will be recorded on the boring log, daily field report or in a field notebook, as appropriate.

4.2 Sampling Equipment (split spoons, trowels, etc.)

Sampling equipment will be decontaminated between sample locations and sample intervals to minimize the potential for cross-contamination.

A. The sampler will be completely disassembled and any adhered soil will be removed.

B. The sampler will be placed in a bucket containing a non-phosphatic soap and water (e.g., *Liquinox*™) and scrubbed until visibly clean. The soap and water will be changed as necessary.

C. The sampler will then be thoroughly rinsed with potable water until all soap solution is removed. All rinse water will be collected and containerized.

C. As required by the site-specific work plan, the sampling equipment may be rinsed with a dilute nitric acid solution if metals are analytes of interest.

D. The sampler will be reassembled and given a final rinse with potable water.

E. If the sampler is not to be used immediately, it must be stored in a location or manner that will prevent it from becoming re-contaminated.

4.3 Groundwater Pumps

This procedure will be employed to decontaminate the non-dedicated pumps that are used during well purging, development, and sampling operations.

A. Any dedicated tubing that was used with the pump will be removed and properly discarded.

B. All exterior surfaces will be wiped with clean paper towels and any extraneous materials will be removed using a stiff brush.

C. The pump and all associated downhole equipment will be placed in a suitably sized container of non-phosphatic soap (e.g., *Liquinox*™) and potable water. If the tubing on the pump is to be re-used, the pump will be turned on to circulate the solution through the pump and tubing.

D. The pump will then be thoroughly rinsed with potable water. If the tubing on the pump is to be reused then the pump will be turned on until the internal portions of the pump and tubing are free of cleaning solution. The last rinse applied to the pump system will always be potable water.

F. The pump and associated downhole equipment will be properly stored to ensure that the system remains clean during transportation to other well heads. The pump will not be allowed to come in contact with the ground at any time during handling and transportation. If this occurs, the pump and associated downhole equipment will be re-cleaned.

G. All liquids and waste materials produced during this operation will be properly stored and disposed of as determined by the Project Manager.

4.4 Bailers

Hull's default/preferred procedure is to employ clean, single-use, disposable bailers such that decontamination is not required. In the event that reusable bailers are employed, they will be decontaminated as described below.

A. The bailer will be scrubbed with non-phosphatic soap and water solution. The inside of the bailer will be scrubbed with a cylinder brush to ensure that interior walls are thoroughly cleaned.

B. The bailer will be rinsed with potable water until it is free of the soap solution.

C. As required by the site-specific work plan, the bailer may be rinsed with a dilute nitric acid solution if metals are analytes of interest.

D. A final rinse of potable water will then be applied.

E The bailer will be properly stored if it is not to be immediately used. For proper storage, the entire bailer will be placed in its dedicated storage tube or wrapped in inert material (e.g., *Saran* wrap, aluminum foil, etc.).

F. All liquids and waste materials produced during this operation will be properly stored and disposed of as determined by the Project Manager.

4.5 Well Casing and Screen Pre-Installation Decontamination Procedures

All polyvinyl chloride (PVC) casing and screen materials contained in clean, sealed packaging direct from the manufacturer may be constructed by personnel wearing clean and unused vinyl or nitrile gloves and directly installed. In the event that visual inspection indicates torn packaging or the potential for contamination of well materials, a power washer or high pressure steam cleaner should be used to clean the material prior to assembly and installation. All wells consisting of Type 304 stainless steel should be cleaned with a high pressure steam cleaner prior to assembly and installation.

4.6 Interface Probe and Water Level Indicator

The entire length of the probe and tape that was inserted into the well will be decontaminated by washing with a non-phosphate detergent (e.g., *Liquinox*™) and then rinsing with potable water.

5.0 Documentation

The procedure(s) employed, date(s), and time(s) will be recorded on the appropriate documentation (e.g., daily field reports, field notebooks, boring logs, etc.). Deviations must be approved by the Project Manager and/or Quality Assurance Officer and documented in the field notebook or field logs.

6.0 Special Notes

None

HULL & ASSOCIATES, INC.
STANDARD OPERATING PROCEDURE

Title: Packaging and Shipping of Non-Hazardous Samples	
Effective Date: 11/6/13	**Document Number: HULLSOP.F1013.R0**
Author	
Name: Monica Williamson Title: Sr. Scientist Signature:	Date: 11/6/13
Approvals	
Name: Ray Kennedy Title: Sr. Project Manager Signature:	Date: 11/6/13

REVISION HISTORY

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F1013-12REV – created in September 2012 to replace 1999 version; superceded in September 2013.	September 2012
F1013-01REV – created in 2001; superceded in September 2012.	2001 (month not recorded)

HULLSOP.F1013.R0
PACKAGING AND SHIPPING OF NON-HAZARDOUS SAMPLES

1.0 Purpose

The purpose of Hull & Associates, Inc. (Hull) Standard Operating Procedure (SOP) is to describe the procedures that shall be used to package and ship all non-hazardous samples. These procedures are the recommended handling procedures for all sample shipments to minimize the loss of samples associated with breakage and/or being received above the method required temperature. These requirements are mandatory for all samples being transported by project personnel. Project personnel include all Hull employees as well as personnel directly employed by the analytical subcontractor. Third-party courier services, regardless of whether contracted internally or by the analytical laboratory, are always considered non-project personnel. Strict adherence to these procedures shall help ensure sample integrity even if delivery is delayed.

2.0 Equipment and Materials

- cooler or other appropriate shipping container;
- duct tape;
- clear packing tape;
- custody seals;
- sealable bags, various sizes;
- packing material (styrofoam peanuts, bubble wrap, etc.); and
- mailing label (in addition to any shipping papers).

3.0 Procedures

The following procedures shall be adhered to for packaging and shipping of all non-hazardous samples. The procedures for packaging and shipping of samples in this SOP should not be used if any materials to be shipped are known or suspected to be hazardous or flammable.

A. Coolers

Coolers are the most common package or containment device used to ship samples. Coolers are also used during sampling efforts to store and transport samples prior to shipping. It is very important that samples be placed in an iced cooler immediately after collection. The ice in the cooler used for shipping will last much longer if the sample containers placed into it have been pre-chilled. The following procedures shall be used when packing the cooler for shipment:

1. Secure the drain on the cooler with packing tape or duct tape to prevent accidental opening.

2. Place each individual sample (soil and/or groundwater) in a *sealable* bag. VOA vials that are aliquots from the same sample can be placed in the same bag. It is recommended that the VOA vials be wrapped with bubble wrap or paper towel to prevent excessive contact during shipping.

3. Select an appropriate cooler size to allow for upright storage of sample containers. Situate the sample containers so that they do not touch each other.

4. Use plastic bubble wrap or styrofoam peanuts as packing or filler material to prevent the samples from colliding and breaking during transportation. Place layers of bubble wrap on the bottom of the cooler. Do not use shredded paper because if the paper becomes wet it will no longer be useful to prevent samples from colliding. Only a minimum amount of packing material should be used as these materials insulate the samples and prevent them from being properly chilled. Plastic sample containers can be placed between glass containers. Bags of ice may be also be used as packaging material between samples. Sample containers should be snug and not easily moved within the cooler.

5. Fill the cooler with ice. EPA protocols do not allow the use of icepacks or ice substitutes (blue ice) because they are unable to maintain a sufficiently cold temperature. Ice must be double-bagged in sealable bags. Forty to fifty percent of the cooler capacity should contain ice in order to keep the samples cold during transport. Sufficient ice should be placed with the samples in the shipping container to ensure that ice is still present when the samples arrive at the laboratory. If a commercial carrier such as FedEx or UPS is shipping the samples it is best to use more ice in case delivery is delayed. Less ice may be used if the samples will be delivered by hand. As a rule of thumb, an average cooler with a capacity of approximately 48 quarts will require two to three eight-pound bags of ice.

6. Temperature blanks shall be placed at the top of the cooler directly under the ice.

7. Chain-of-custody (COC) records shall be completed as described by HULLSOP.F3014.R0 (or current version). Place the COC record in a sealable bag and tape the bag to the underside of the cooler lid. If samples are packed in multiple coolers, the number of coolers should be marked on the COC record and a photocopy of the COC shall be placed in each cooler.

8. Tape the cooler shut to prevent accidental opening or potential leakage. Tape shall be placed around the entire perimeter of the lid and then around the body of cooler in two or three places. Do not tape down or otherwise restrict access to the cooler handles. Coolers used for shipping should not have any broken or missing handles.

9. Custody seals shall then be placed on the cooler to document the integrity of the shipping container. A minimum of two custody seals shall be placed on each cooler in a manner that the cooler cannot be opened without breaking the seal. Each custody seal shall be signed and dated by the person packing the cooler and the seals shall covered by clear packing tape to prevent accidental loss or damage during shipping. Duct tape may be used as a custody seal, but should be signed and dated by the person packing the cooler.

10. Affix a mailing label with the laboratory's address on the cooler. Apply clear tape over the address label to prevent accidental loss or damage during shipping. This label is required in addition to any shipping papers required by carriers.

B. Boxes

Some samples do not require temperature control and may be shipped in boxes. The boxes should be sturdy enough to withstand rough handling. No liquids shall ever be shipped by box. Materials suitable to be shipped by box include:

1. Air samples in summa canisters or airtight gas sampling bags or other non-pressurized sample containers.

2. Bulk asbestos samples.

3. Soil samples for geotechnical analyses.

These materials may be securely packed in a suitable box. The box shall be sealed with packing tape and affixed with address labels and custody seals as described above.

4.0 Documentation

A copy of any applicable shipping papers shall be retained for future reference. Any pertinent shipping information should be recorded on the Daily Field Report or in the field notebook for the project.

5.0 Special Notes

None

6.0 Applicable Standards or References

Hull & Associates, Inc. Standard Operating Procedure No. HULLSOP.F3014.R0 or current version (Chain-of-Custody Procedures).

HULL & ASSOCIATES, INC.
STANDARD OPERATING PROCEDURE

Title: Chain-of-Custody Procedures – Environmental Samples	
Effective Date: 11/4/13	**Document Number: HULLSOP.F3014.R0**
Author	
Name: Monica Williamson Title: Sr. Scientist Signature:	Date: 11/4/13
Approvals	
Name: Ray Kennedy Title: Sr. Project Manager Signature:	Date: 11/4/13

REVISION HISTORY

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HULLSOP.F3014.R0 – created in November 2013 as part of overall reorganization of Hull's SOP program. While this version supercedes F3014-12REV, the content is generally equivalent to the 2012 version; only minor editorial modifications were made and the document name was changed for consistency with Hull's updated SOP nomenclature.	November 4, 2013
F3014-12REV – created in 2012; superceded in September 2013.	2012 (month not recorded)
F3014-02REV – created in 2002; superceded in 2012.	2002 (month not recorded)

HULLSOP.F3014.R0
CHAIN-OF-CUSTODY PROCEDURES
ENVIRONMENTAL SAMPLES

1.0 Purpose

This Hull & Associates, Inc. (Hull) Standard Operating Procedure (SOP) documents the chain-of-custody (COC) procedures that will be employed during all environmental sampling activities.

2.0 Equipment and Materials

- Indelible ink ball-point pens
- Chain-of-custody records
- One-gallon size *Zip-Loc* (or equivalent) storage bags

3.0 General

A completed COC record must accompany every sample from the point of collection to delivery to the laboratory. A single COC record may accompany several samples as long as all the samples are contained in a single unit (e.g., cooler, box, etc.). If a single COC is to be used for multiple samples in multiple coolers, then a photocopy of the original COC must be placed in each cooler. All COCs will be kept in one-gallon *Zip-Loc* bags, or equivalent to prevent damage from melting ice, broken samples, and bad weather. A copy of every completed COC record will be retained in the project files.

4.0 Procedures

4.1 Completion of COC Record

A. The COC record is initiated in the field by the sampler(s) immediately after a sample is collected. Figure F3014-1 illustrates a properly completed COC.

B. The sample identification number will be recorded on the COC. Each sample number consist of three distinct data fields. These data fields include; Project Number, Sample Location, and Sample Type. A space for each data field is provided on the COC.

C. The number of containers that makes a complete sample will be recorded in the box labeled "No. of Containers." A sample may consist of multiple containers depending upon the analytical procedures requested.

D. If the sample is to be analyzed for metals, the box labeled "Metals" shall be completed to indicate whether the sample fractions for metals have been filtered. A "F" will be used to indicate that the metals were filtered and a "N" will indicate that they were not filtered. Occasionally, some samples may require metal fractions to be filtered and not filtered (e.g., analyses for dissolved and total metals). In this case,

"B" will be used to indicate that the sample contains both filtered and non-filtered fractions. If the sample does not require analyses for metals a single line will be drawn through this box.

E. The date and time (military) of sample collection will be recorded in the box labeled "Sampling Date/Time." It is very important to note the time each sample was collected even if samples are collected a few minutes apart.

F. The requested analytical methods will be recorded in the diagonal spaces provided under the box labeled "Analyses." The preservatives added to the containers for each analytical method will be indicated by recording the letter in the box labeled "Preservatives" that corresponds to the preservative added. The preservatives and corresponding letters are listed near the top of the COC record. Finally, a check mark(s) will be made under each analysis for which a particular sample will be analyzed.

G. Any comments relating to the collected sample(s) can be recorded in the box labeled "Comments." These comments may indicate special handling or analytical instructions for the laboratory (e.g., compositing instructions, confirm MTBE, etc.) or may be used to indicate the location of sample collection.

H. Additional information required on the COC record includes the person the analytical reports should be sent to, client, site, project description, project number, names of all samplers involved in sample collection, where the samples are to be delivered, method of delivery, and airbill number (if applicable).

I. In certain instances when a Hull COC is not available, it may be necessary to use a laboratory-supplied COC. The laboratory-supplied COC should contain the information outlined in Section 4.1; A through H.

4.2 Transfer of Custody

A. The COC record must document the transfer of custody each time the sample(s) changes hands. The National Enforcement Investigations Center (NEIC) of the United States Environmental Protection Agency (EPA) defines custody as:

1. the sample is in your physical possession;

2. the sample is within view after being in your physical possession;

3. the sample was in your possession and then you locked it or sealed it to prevent tampering; and/or

4. the sample is placed in a designated secure place with limited access to authorized personnel only.

B. When transferring custody of samples, the person in custody (e.g., the sampler) must sign the box labeled "Relinquished By" and fill in the date and time (military time) the custody of the samples was relinquished. The person accepting

custody of the samples must then sign the box labeled "Received By" and complete the date and time (military time) the custody of the samples was accepted.

C. The above procedures must be followed until the samples are delivered to the laboratory. Both internal (within the same organization) and external (between different organizations) transfers need to be documented. In cases where a commercial courier (e.g., Federal Express) is used to deliver the samples, the person relinquishing custody to the courier should put the name of the courier in the "Received By" box and seal the COC inside the cooler. Most couriers have a policy against signing for custody of samples.

D. The pink copy (bottom) of the COC will be retained by the sampler before the samples are shipped and the remaining copies (white and yellow) of the COC are delivered to the laboratory. The pink copy will then be immediately given to the Project Manager or Quality Assurance Officer (QAO). The white copy will be returned by the laboratory with the final report.

5.0 Documentation

Chain-of-custody record

6.0 Special Notes

If samples are shipped via commercial courier on Friday the air bill needs to be checked for Saturday delivery and appropriate “Saturday Delivery” stickers (provided by the courier company) must be affixed to the container.

If samples are known to contain flammable or hazardous materials they need to be shipped accordingly. Check with the courier for specific shipping, labeling and packing requirements.

7.0 Applicable Standards and References

U.S. Environmental Protection Agency. NEIC Policies and Procedures. EPA-330/9-78-001-R. May 1978. (Revised February 1983.)

U.S. Environmental Protection Agency. User's Guide to the Contract Laboratory Program. Office of Emergency and Remedial Response. December 1986.

U.S. Environmental Protection Agency. A Compendium of Superfund Field Operations Methods. EPA/540/P-87/001, December 1987.

FIGURE

FIGURE 3014-1

Hull & associates, inc.

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

NO. 8323

Dublin, OH ☒
6397 Emerald Pkwy
Suite 200
Dublin, OH 43016
P: (614) 793-8777
F: (614) 793-9070

Indianapolis, IN ☐
6435 Castleway W. Dr.
Suite 119
Indianapolis, IN 46250
P: (800) 241-7173
F: (614) 793-9070

Mason, OH ☐
4770 Duke Dr.
Suite 300
Mason, OH 45040
P: (513) 459-9677
F: (513) 459-9869

Bedford, OH ☐
4 Hemisphere Way
Bedford, OH 44146
P: (440) 232-9945
F: (440) 232-9946

Toledo, OH ☐
3401 Glendale Ave.
Suite 300
Toledo, OH 43614
P: (419) 385-2018
F: (419) 385-5487

Pittsburgh, PA ☐
300 Business Center Dr.
Suite 320
Pittsburgh, PA 15205
P: (412) 446-0315
F: (412) 446-0324

REPORT TO: K. WILDMAN

Client: ABC COMPANY
Site: ANYTOWN, USA
Project #: ABC001 Phase: 01.SMP
Samplers: J. SMALL, T. LARGE

SAMPLE TYPES	PRESERVATIVES		METALS
A - AIR	A - Cool only, <4 deg. C	H - EDTA	F - Filtered
C - ASBESTOS	B - HNO_3 pH<2	I - 5ml 1:1 HCL	N - Not filtered
D - SEDIMENT	C - H_2SO_4 pH<2	J - None	B - Both
G - GROUNDWATER	D - NaOH pH>12	K - Stored in dark	
P - PRODUCT	E - ZnAcetate + NaOH, pH>9	L - NH_4Cl	
S - SOIL	F - $Na_2S_2O_3$ (0.008%)	M - Methanol	
W - WATER	G - HCL pH <2	S - Sodium bisulfate	
Z - OTHERS			

All samples are kept at 4 degrees Celsius.

PROJECT NO.	SAMPLE LOCATION	SAMPLE TYPE & ID	NO. OF CONT.	METALS	COLLECTION DATE/TIME	ANALYSES: PRESERVATIVES	A	A	G	B	COMMENTS
							VOCs - 8260	PAHs - 8310	VOCs - 8260	RCRA METALS	
ABC001	MW-1	S020030	2	—	11/14/13 0905		X	X			
ABC001	MW-2	S030035	2	—	11/14/13 1013		X	X			(HOLD SAMPLE)
ABC001	MW-3	S080100	2	—	11/14/13 1315		X	X			
ABC001	MW-1	G111413	3	F	11/14/13 1528			X	X		
ABC001	FB-1	W111413	2	—	11/14/13 1530			X			
ABC001	TB-1	W111413	2	—	11/14/13 —			X			
					/						
					/						
					/						
					/						
					/						
					/						

RELINQUISHED BY: J. SMALL	DATE: 11/14/13 TIME: 1705	RECEIVED BY: FEDEX	DATE: 11/14/13 TIME: 1705
RELINQUISHED BY:	DATE: TIME:	RECEIVED BY:	DATE: TIME:
RELINQUISHED BY:	DATE: TIME:	RECEIVED FOR LAB BY:	DATE: TIME:

COOLER TEMPERATURE AS RECEIVED: °C

DISTRIBUTION:
WHITE - LAB USE (MUST BE RETURNED WITH REPORT)
YELLOW - LAB USE
PINK - RETAINED BY HULL

Deliver To: SOME LABORATORY, INC.
Method of Delivery: FEDEX
Airbill Number: WZ9832109X
NOTES: VAP PROJECT

TURN AROUND TIME: 14 DAYS

HULL & ASSOCIATES, INC.
STANDARD OPERATING PROCEDURE

Title: Surface and Subsurface Sediment Sampling	
Effective Date: 9/10/13	**Document Number: HULLSOP.F3027.R0**
Author	
Name: Tracy Edwards Title: Sr. Project Manager  Signature:	Date: 9/10/13
Approvals	
Name: Bill Dennis (on behalf of Dave Mustafaga – Division Leader) Title: Sr. Project Manager  Signature:	Date: 9/10/13

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F3027-12REV – created to update both F3021-00REV and F3027-08REV; superceded in September 2013	2012 (month not recorded)
F3027-08REV – created in 2008, superceded in 2012 by F3027-12REV	2008 (month not recorded)
F3021-00REV – created in 2000, superceded in 2008 by F3027-08REV	2000 (month not recorded)

HULLSOP.F3027.R0
SURFACE AND SUBSURFACE SEDIMENT SAMPLING

1.0 Purpose

This document describes the general and specific procedures that will be followed and identifies special considerations when collecting surface or shallow subsurface sediment samples.

For the purpose of this Standard Operating Procedure (SOP), surface sediments are those found in the upper 0-16 cm (0-7 inches). Subsurface deposits are those found at greater depths. The sampler will consult the project documents to determine the appropriate sampling depths.

2.0 SOP Specific Terminology

Sediment – unconsolidated inorganic and organic materials that are suspended in and being transported by surface water or has settled out and deposited under surface waters which include 1) materials below bankfull elevation in streams, rivers, or ditches and below the ordinary high water mark of lakes or ponds; 2) materials within the federal jurisdictional boundaries of wetlands; 3) materials at and below the maximum capacity for ponds and lagoons and 4) deposits along and adjacent to surface water bodies that were deposited under historic submerged conditions.

Surface Sample – samples collected from within the top seven inches of the sediment deposits.

Subsurface Sample – samples collected from depths greater than seven inches from the top of the sediment column.

Submerged – found beneath the surface of standing water.

Dry sediments – sediments where the void spaces are filled with air**.**

Saturated sediments – sediments where the void spaces are all filled with water**.**

Dredge – A device that is dragged across the sediment interface collecting a composite of surface sediment and benthic fauna.

Core – A column of undisturbed sediment from which depth-discrete samples can be collected.

Grab – A single, discrete sample collected from one location at one point in time.

Composite – A thoroughly homogenized set of two or more grab samples.

Left Bank –The left bank of a river when facing up downstream.

Right Bank – The right bank of a river when facing downstream.

Winch - A stationary motor-driven or hand-powered machine used for hoisting or hauling, having a drum around which is wound a rope or chain attached to the load being moved.

3.0 Sample Types

There are three main types of sediment sampling: grab, core and dredge. The type of sample to be collected is determined by the intent of the testing (i.e. spatial sampling, sediment accumulation profiles, chemical analyses, grain size analyses, etc.) and characteristics of the study area such as the depth of water, depth of sediment, and the strength of the current.

Grab sediment samples are most commonly used to collect surface sediment where the intent is to characterize the horizontal heterogeneity of surface sediment. The easiest method for collecting grab samples is to use a spoon or trowel; however, this method produces limited volume of sediment and the collection depth often cannot be accurately determined. Dredges may be used when larger volumes of sediment are required and are typically used in deep open waters; however this method provides limited control of the sample location, depth, and volume, and causes disruption of the sediment and pore water integrity (EPA, 2001) and loss of the fine grained sediment fraction. Dredge samplers are typically deployed for benthos studies. Core samplers are used in thick sediment deposits or for the collection of sediment profiles to determine the vertical distribution of sediment characteristics. Core samples are recommended when the data quality objectives of the investigation require accurate sediment sampling depths, when vertical profiles are needed to assess the quality of sediments at depth, or when it is important to maintain sampled sediments in an oxygen-free environment for intended analytical testing.

4.0 Special Considerations

Sediment characteristics quality can vary substantially horizontally and vertically depending upon flow rates and depositional history. It is critical that the sediment samples be collected from the sample horizon(s) identified in the work plan. Sampling procedures will vary depending upon whether the sediment deposits are submerged or not, and how deep the water is at the sampling locations. Ideally, an initial bathymetric survey will guide the choice of sampling technique at various locations.

If sampling locations have not been pre-determined by requirement of the Site-specific work plan or sampling plan, the field team will be required to select the sampling locations. The sampling sequence should commence from the furthest downstream sampling point location, proceeding up-stream. Samplers should face upstream when collecting the samples. If surface water samples are to be collected in addition to the sediment, the water samples will be collected first.

5.0 Health and Safety

The buddy system is required for all sediment sampling programs that are implemented in settings where there is standing or flowing water. The sampling crew is required to wear life vests at all times near the water; a safety line will be required where there is fast moving water, water is present at depths greater than three feet and there is the potential for unstable footing.

Where use of a boat is required to obtain sediment samples, appropriate Health & Safety directives applicable to watercraft must be observed.

6.0 Equipment and Materials

Refer to Table 1 for additional information on specific sampling devices.

- Laboratory supplied sampling containers; EnCore Samplers or equivalent if testing for volatile organic compounds (VOCs);
- Nitrile and/or latex sampling gloves;
- Sampling flags;
- Garbage bags;
- Permanent marking pen;
- Hack saw;
- Electrical tape;
- Global positioning system (GPS) receiver;
- Life vests and safety lines;
- Flat bottom boat (if applicable);
- Waders;
- Spade/shovel and stainless steel (SS) or *Teflon* trowel/scoop (for shallow wadable water sample collection);
- Slide hammer (fence post driver) for driving sediment column samplers;
- Bucket auger or tube auger (shallow wadable water);
- Extendable T- handle;
- Ekman or Ponar dredge or similar (lakes and ponds);
- 2" or 3" O.D. polycarbonate (e.g., Lexan) tubing;
- 2" or 3" I.D. polycarbonate (e.g., Lexan) tubing;
- Drop hammer (fencepost hammer);
- Polycarbonate adhesive (*Rez-n-Bond*™);
- Core sampler (AMS, split spoon, polyvinyl chloride (PVC) or similar piping);
- Core sleeves (PVC, mylar, brass liners, Shelby tubes, or similar);
- Decontamination equipment and supplies; and
- Nylon rope or steel cable for safety line and dredge retrieval.

7.0 Procedures

7.1 Sampling dry or saturated non-submerged sediment

Under these conditions, a spoon/trowel or hand-driven core sampler is used to obtain samples.

Discrete Grab Samples

A. All sampling equipment will be decontaminated prior to use in accordance with the procedures specified in the current Hull SOP for equipment decontamination.

B. If a shallow subsurface sample is desired, the trowel or spade will be used to remove the top layer of sediment to the desired sample depth.

C. A sampling device (e.g., spoon) will be used to remove the sample from the sediment on the blade of the trowel or spade, avoiding the thin layer of sediment from the area which comes in direct contact with the trowel or spade.

D. The sample will be placed into an appropriate sample container supplied by the laboratory.

E. The sample container will be labeled with the appropriate information. All chain-of-custody documents will be completed and the appropriate information recorded in the field log book or report form (see current Hull Chain-of-Custody SOP).

F. The labeled sample container will be placed in an appropriate transport container with ice (if required) as soon as possible.

G. All sampling equipment will be decontaminated between sample locations in accordance with the procedures specified in the current Hull SOP for equipment decontamination.

Core Samples

Core sampling in dry or saturated non-submerged sediment can be completed using push tubes, gravity corers, or sand pounders. Procedures for core sampling are described under Section 7.2 below.

Composite Samples

Discrete samples that comprise a composite sample will be collected as described above; however, a stainless steel mixing bowl or *Teflon* tray will be used for mixing the discrete samples prior to placing the sample in the laboratory-supplied sample containers. Composite sampling is generally not recommended when samples are to be analyzed for VOCs (see the current Hull SOP for Soil Sampling Procedures for EPA Method SW-846 5035).

7.2 Sampling submerged sediment

In very shallow water (e.g., less than one foot), it may be possible to obtain surface or shallow subsurface sediment samples with a spoon as described in section 7.1 above. In deeper water, surface sediment grab samples (top one to two inches) of soft sediment may be obtained with a dredge-type sampler (e.g., Eckmann, Ponar, or other equivalent device) if there is no leaf litter layer or other obstructions. Where samples must be obtained from sediments deeper than one to two inches, where surface litter or sediment density precludes efficient dredge operation, or where the target sediment includes a large proportion of fine grained material, core sampling must be conducted. Core sampling can consist of push tubes, hand driven corers (such as the AMS sediment corer) or in deeper non-wadeable water, gravity corers or vibrating coring devices may be used.

Grab Sampling using a Dredge

A. All sampling equipment will be decontaminated prior to use in accordance with the procedures specified in the current Hull SOP for equipment decontamination.

B. The appropriate length of suitable suspension cord will be attached to the decontaminated sampler. A 3/16-inch diameter braided line will normally provide sufficient strength; however, a 3/8-inch diameter line will allow easier hand-hoisting.

C. The distance beneath the surface to the sample location will be marked on the sample line. A second mark will be identified on the sample line that is approximately one meter less to indicate proximity to the sample depth. This will identify the depth where the lowering rate will be reduced to minimize unnecessary disturbance of the sludges or sediments. If sampling relatively shallow streams, it is not necessary to mark the line because the sampler will be lowered very slowly until the bottom is contacted.

D. The free end of sample line will be tied to a fixed support to prevent the accidental loss of the sampler. Allow sufficient slack in the line to perform sampling activities.

E. The sampler jaws will be opened until they latch. From this point on, the sampler will be supported by its sample line only or the sampler may be tripped and the jaws will close prematurely.

F. The sampler will be slowly lowered until the proximity mark (the first mark encountered) is reached or the bottom is contacted.

G. The rate of descent will be slowed through the last meter of fall until contact with the bottom is observed.

H. The sample line will be allowed to go slack several inches. In strong currents, more slack may be necessary to release the mechanism. In shallow streams, the top of the clamshells may be gently pushed with a probe to allow the clamshells to sink deeper into the sediments and maximize recovery.

I. The sampler will be raised clear of the water surface.

J. The sampler will be placed into a stainless steel or *Teflon* tray and opened. The sampler will be lifted clear of the tray.

K. The sample will be collected with a sampling device (e.g., spoon) and placed into an appropriate sample container.

L. The sample container will be labeled with the appropriate information. All chain-of-custody documents will be completed and the appropriate information recorded in the field log book or report form.

M. The labeled sample container will be placed in an appropriate transport container on ice (if required) as soon as possible.

N. All sampling equipment will be decontaminated in accordance with the procedures specified in the current Hull SOP for equipment decontamination.

Sampling With a Push-Tube Core Sampler

The following procedures are applicable to push tube-type coring devices. Please refer to the Work Plan/Field Sampling and Analysis Plan and manufacturers' instructions for specific coring devices.

A. Obtain clear polycarbonate (e.g., Lexan) tubing of sufficient diameter and size for sampling effort. Two-inch OD (outside diameter) cores are sufficient for most chemical analytical sampling, while three-inch OD cores may be needed for geotechnical analysis.

B. The length of tubing obtained should take into account both the depth of the planned sediment core and the depth of any standing water under which the sediment core is to be taken. Polycarbonate tubing is typically available in eight foot lengths. Tubing sections can be joined together to reach depths greater than eight feet. A section of polycarbonate tubing with an inside diameter matching the OD of the sample tubing will be obtained and cut into four to six inch collar lengths to fit over and join sections of the sample tubing. A polycarbonate adhesive such as *Rez-n-Bond*™ is then used in the field to glue the collar to each joined section of the sampling tube.

C. The tubing is advanced throughout the water column and into the sediment using a fence post hammer (drop hammer). The sample tubing will be advanced to the desired depth or until refusal is encountered. Ideally, the tubing will be advanced six inches past the desired maximum depth of the sample to allow for some loss of sediments out the end of the sampler. Once the tubing has been driven, the section of tubing remaining above the level of the surface water will be filled with water so that the tubing is completely full of water. The tubing will then be sealed with a plastic cap. Electrical tape will be used to make sure that the cap is securely fastened to the tubing. After the tubing has been capped, it can then be removed by hand. When extracting the tubing, care should be taken to pull the tubing straight up and the cores need to remain vertical. Once the tubing has been fully extracted, the bottom of the tubing will then be capped similar to the top.

D. The sample cores will then be prepared by removing the section of tubing full of water that is above the sediment. At a point at least six inches above the top of the surface of the collected sediments, a hack-saw cut should be made until the wall of the tube is just breached and the standing water in the tube can be slowly drained by gravity. If the cut is made too low or is too big, the top of the sediment core may be disturbed by the turbulence created by a rapid outflow of water. Care should be taken so that the draining water is directed away from the samplers and any surfaces (boat) that may be become slippery when wet.

E. Once the water is drained (except for the first six inches on top of the core), tubing is cut the rest of the way through at the drain saw cut mark above the core, and the core is then re-capped.

F. The intact core can be visually inspected for stratigraphy. The desired depth intervals of sample core may be sectioned off by cutting the interval out of the core with a hack saw. These subsections may then be recapped or the sediments may be extracted and placed in other containers. If the samples are to be submitted for chemical analyses, the hack saw blade must be decontaminated between cuts in accordance with the current Hull SOP for equipment decontamination.

G. If the sediment samples are to be submitted for chemical analyses but will not be immediately subdivided, the cores should be stored on ice in a large garbage can or other suitable container until they are processed as described above.

Sampling with Gravity Corer

A. Decontaminate portions of the sampling equipment that will make contact with the sample in accordance with the current Hull SOP for equipment decontamination.

B. Place the sample sleeve/liner inside the sampler body.

C. Insert the sediment catcher into the lower end of the sampling tube with the convex surface positioned inside the sample sleeve.

D. Screw the nosecone onto the lower end of the sampling tube, securing the acetate sleeve and egg-shell check valve. Screw the bracket to the top of the sampling tube.

E. Place the core catcher (typically stainless steel) at the tip of the sampler.

F. Thread the nose cone onto the sampler.

G. Add additional weight disks if needed.

H. Attach deployment cable line to the top of the main body of the sampler and secure the line at the surface.

I. Deploy the sampler by lowering the sampler body into the water using the cable line as fast as possible.

J. Allow the sampler to free fall into the sediment column. The gravity corer may be modified to attach a slide-hammer mechanism if needed to drive the sampler deeper into the sediment column.

K. Record the length of the tube that penetrated the sediment.

L. Extract the tube from the sediment and carefully remove the coring device from the water. A slide hammer may be attached to the coring apparatus and used to extract the corer from the sediment column by sharply pulling up on the hammer.

M. Unscrew the nosecone and remove the core catcher.

N. Slide the acetate sleeve out of the sampler tube. Decant surface water, using care to retain the fine sediment fraction. The sample may be used in this fashion, or the contents transferred to a sample or homogenization container.

O. If head space is present in the upper end, a hacksaw may be used to shear the acetate tube off at the sediment surface. The acetate core may then be capped at both ends. Indicate on the acetate tube the appropriate orientation of the sediment core using a waterproof marker.

P. The sediment may be extracted from the acetate sleeve and manipulated in the typical fashion. Extrude the sample from or open the acetate tube and transfer the sediment to an appropriate homogenization or sample container. Ensure that non-dedicated containers have been adequately decontaminated.

Sampling with Sand Pounder (such as Ogeechee Sand Pounder)

A. Decontaminate portions of the sampling equipment that will make contact with the sample in accordance with the current Hull SOP for equipment decontamination.

B. Place the sample liner inside the core barrel.

C. Place the core catcher (typically stainless) at the tip of the sampler.

D. Thread the nose cone onto the sampler.

E. Secure the deployment cable at the surface for retrieval assistance.

F. Connect the extension handle to the sampler body.

G. Deploy the sampler through the water column and obtain the sample by exerting downward pressure while twisting on the handle or if needed, attach the optional drive hammer to the assembly.

H. Drive sampler by manually raising and lowering the hammer to drive the sampler into the sediment column.

I. Sharply pull the drive hammer upwards and dislodge the sampler from the sediment. Slowly withdraw the sampler from the sediment; use of a winch may be necessary in fine grained deposits.

J. Carefully remove the coring device from the water.

K. Unscrew the nosecone and remove the core catcher.

L. Slide the acetate sleeve out of the sampler tube. Decant surface water, using care to retain the fine sediment fraction. The sample may be used in this fashion, or the contents transferred to a sample or homogenization container.

M. If head space is present in the upper end, a hacksaw may be used to shear the acetate tube off at the sediment surface. The acetate core may then be capped at both ends. Indicate on the acetate tube the appropriate orientation of the sediment core using a waterproof marker.

N. The sediment may be extracted from the acetate sleeve and manipulated in the typical fashion. Extrude the sample from or open the acetate tube and transfer the sediment to an appropriate homogenization or sample container. Ensure that non-dedicated containers have been adequately decontaminated.

Core Sampling with Motor Assembly (such as Vibracore)

A. Attach a tether to the core barrel.

B. Attach the vibrator head near the top of the unsharpened end of the core barrel prior to initiating the coring procedure.

C. Vertically position the core barrel at the sampling location and allow it to sink under its own weight.

D. Rapidly advance the core barrel by initiating the vibrator head engine.

E. Pull downward on the tether to assist penetration through resistant surfaces.

F. Remove the vibrator head.

G. Measure the distance to the sediment surface both inside and outside the pipe to determine the amount of compaction.

H. Cut the pipe approximately 2 feet above the ground surface (if working in wetland area) or water surface (if working in deeper water) with a hacksaw.

I. Fill the pipe with water and seal the end to prevent loss of sediment from the core pipe once it is retrieved.

J. Assemble a tripod over the intruded pipe.

K. Fasten two come-alongs the eyeloops on the tripod head and to a rope securely fastened to the core pipe.

L. Extract the sample core barrel.

M. When the core is completely out of the sediment, remove the come-alongs.

N. Open the core pipe slot by pulling on the cord that moves the spring-loaded slot gate.

O. Gently place the core barrel horizontally to prevent disturbance of the core and examined.

Sample Extraction, Preparation and Sampling from Core Barrels

The following general sample collection procedures are applicable to all coring devices. Equipment-specific procedures will be used where / when applicable.

Extraction

A. Remove the sediment samples from the core either by splitting the core lengthwise and removing the selected sample or by drilling holes in the core liner.

B. Splitting the core lengthwise is preferred since it allows direct observation of the sediment structure, bedding, lithologies and other features. Samples can be collected from one half of the core and the other half can be preserved for future studies or sampling.

C. A power drill fitted with a 1.5- to 2-inch saw can be used to make holes in the liner to remove the samples with a spoon. The core sleeve plug can be replaced with duct tape or electrical tape. Spacing of approximately 1 foot is recommended to ensure that the samples are representative of the lithologies in the cores.

Sample Selection from Core Sampler

Discrete Samples

A. Samples recovered from the first depth interval (zero to seven inches) may be obtained with a stainless steel spoon if water depth allows. The sample will be placed in a properly labeled laboratory container. The labeling must include the date of collection, project no., sample location, sample number, sampling depth interval, and sampler's ID number.

B. All depth intervals will be sampled with the appropriate core sampling device. The sample will then be transferred to the sample containers by pouring the sediments into the appropriate containers. If it is not possible to pour the sediments, a clean stainless steel spoon or spatula may be used to facilitate the transfer.

C. Sampling equipment shall be decontaminated between sample intervals, as well as between sampling locations, in accordance with the current Hull SOP for equipment decontamination.

Composite Samples

Composite samples are typically comprised of samples from equivalent sediment depths at multiple locations.

A. Composite samples, consisting of a pre-determined number of discrete samples, may be recovered using the soil recovery probe. Dedicated plastic sampling sleeves will be used for these composite samples. The probe will be driven to an appropriate depth, and a sample recovered from the appropriate depth at each sampling location. The equal volume samples will then be composited by mixing in a stainless steel pan and then placed in a properly labeled laboratory container. The sampling equipment shall be decontaminated between sampling zones in accordance with the current Hull SOP for equipment decontamination (i.e., between areas represented by a composite sample).

B. Where exact mapping of sample locations is required, the discrete sample locations shall be marked in such a way that they can be properly mapped.

8.0 Documentation

Each sample container will be labeled as directed by the Project Work Plan or by the Project Manager and a chain-of-custody record will be completed. A field log book or other Field Data Sheet will be kept describing the sampling procedures, the sample locations, all sample identification numbers, and any deviations from this SOP. A map or site sketch will be constructed of all sample locations using field measurements, GPS coordinates, or from coordinates obtained from a qualified surveyor. If necessary, an elevation of the sample location will be obtained and referenced to an appropriate benchmark.

9.0 Special Notes

The decontamination process will be repeated after each use and between all discrete sample locations. If compositing strategies are used, decontamination may only be required between composite samples (i.e., not between discrete samples that form a single composite). Sample gloves shall be changed in between each location.

10.0 Applicable Standards and References

Ohio Environmental Protection Agency. Sediment Sampling Guide and Methodologies, 2nd Addition. November 2001.

Tetra Tech EM, Inc for U.S. EPA (National Exposure Research Laboratory, Environmental Science Division) Literature Review and Report Surface Sediment Sampling Technologies. July 24, 2003.

U.S. EPA. Characterization of Hazardous Waste Sites, A Methods Manual - Vol. II, Available Sampling Methods. 2nd Ed. 12/84. EPA/600/4-84/076.

U.S. EPA Region IV, Sediment Sampling SOP. September 2010. SESDPROC-200-R2.

HULLSOP.F3027.R0
TABLE 1
SUMMARY OF COMMON SEDIMENT SAMPLING EQUIPMENT

TYPE	MODEL	DESCRIPTION	PENETRATION DEPTH	WATER CURRENT APPLICATION	SAMPLE LOCATION	SUBSTRATE TYPE	REMARKS
GRAB	Inert Scoop or Spoon (stainless steel, Teflon, etc.)	Stainless steel or Teflon hand tools	Typically up to 1 ft in combination with using a spade.	None to Slight	Dry Saturated Submerged	All	- Use only in calm, shallow water - Relatively little sample disturbance - Simple and inexpensive - Fines may be washed out when retrieved through water column
GRAB	Eckman -Birge	Box-style sediment sampler including a messenger operated release device; overlapping cover plates, loosely hinged at the top of the box; permits an outflow of water during descent and closes tightly to prevent wash out of sediment during ascent.	4.5-13.5 in.	None to Very Slight	Submerged	Fine Grained Sediment (silt and clay)	- Use only in calm, shallow water - Relatively little sample disturbance - Excellent Jaw Shape and Cut - Pebbles or branches may interfere with jaw closure - Poor stability. Light weight allows for the device to "swim" in a current which can cause mis-triggers. - 0.02 m^2 sample area - Sample Weight is 10 kg (22 lb.)
GRAB / DREDGE	Petite Ponar Peterson	Claw-type sampler designed for penetrating deep into the substrate; used in fresh and salt waters to collect samples of hard sediments such as sand, gravel or clay.	4.5 in.	None to Very Slight	Submerged	Clay to Fine Gravel	- Use only in calm, sheltered water - Good Stability - Less sample wash-out if used with extra weight - Relatively little sample disturbance - Requires a winch - 0.1 to 0.2 m^2 sample area - Weight with Sample is 30-50 kg (66-110 lb.)
GRAB	Shipek	Center pivot sampler designed to collect unconsolidated sediments from deep lakes and near off-shore.	4.5 in.	None to Strong	Submerged	Clay to Gravel	- Use requires a boat/barge with winch (mini-Shipek can be used manually) - Most reliable in terms of triggering, stability, washout and leaching. - Excellent Jaw Shape and Cut - Clean cutting action - 0.04 m^2 sample area - Weight with Sample 60-70 kg (132-154 lb.) - Weight with Sample of Mini Shipek is 20-30 kg (44-66 lb.)

TABLE 1
SUMMARY OF COMMON SEDIMENT SAMPLING EQUIPMENT

TYPE	MODEL	DESCRIPTION	PENETRATION DEPTH	WATER CURRENT APPLICATION	SAMPLE LOCATION	SUBSTRATE TYPE	REMARKS
CORE	BOX	Large sampler usually deployed in large lakes or open ocean for the collection of relatively undisturbed samples; sampler requires deployment with a winch and the depth of the sample is dependent upon the substrate and the speed at which the sampler is deployed onto the floor.		None to Strong	Submerged	Clay to Sand	- Difficult to handle - Large Sample Volume - Use requires a boat/barge with winch
CORE	Manually Driven Corers Core Tubes/Push Tubes, AMS, Russian, Ogeechee	Manually driven devices with or without core liners which can be bottom or side filling samplers; can be fitted with extension handles and slide hammers for advancing the sampler.	1-9 ft.	None to Strong	Dry Saturated Submerged	Clay to Sand Inserts needed for sandy deposits	- Recommended for shallow water - Samples may compress - Deployed by hand or driver (slide hammer) - Extension handles can be used in deeper waters
CORE	Piston	Stainless steel frame with internal core tube, nose piece and core retainers; sampler exerts pressure to allow for greater sample retension.	6-60 ft.	None to Moderate	Dry Saturated Submerged	Clay to Sand Inserts needed for sandy deposits	- Recommended for shallow water - Vertical profile remains intact and visible - Point design can reduce sample compaction - Stone can interfere with sample collection - Deploy by hand or by driver (slide hammer) - Equipment is heavy

TABLE 1
SUMMARY OF COMMON SEDIMENT SAMPLING EQUIPMENT

TYPE	MODEL	DESCRIPTION	PENETRATION DEPTH	WATER CURRENT APPLICATION	SAMPLE LOCATION	SUBSTRATE TYPE	REMARKS
CORE	Gravity (KB Corer)	Stainless steel frame fitted with fins and an internal core tube, nose piece and core retainers; the fins stabilize the sampler as it is allowed to free fall and penetrate the sediments under it own weight.	3 ft.	None to Moderate	Saturated Submerged	Fine Sediment Silt and Clay	- Recommended for rivers - Recommended for depth up to 10 meters (~33 feet) - Point design can reduce sample compaction - Stone can interfere with sample collection - Deploy by hand or by driver (slide hammer) - Equipment is heavy
CORE	Phleger	Stainless steel sampler consisting of a weighted hollow tube that is used to penetrate the bottom sediment layers so the vertical deposition of sediments can be studied.	22 in.	None to Moderate	Saturated Submerged	Fine Sediment Silt	- Quick and easy - Recommended for short cores in soft sediment - Relatively undisturbed samples - Small sample volume - Sampler generally deployed from a boat - Equipment is heavy
CORE	Vibracore	Stainless steel sampler designed to collect sediment samples from lakes, bays, and estuaries; constructed of stainless steel; can be powered by portable generators.	6-39 ft.	None to Moderate	Saturated Submerged	Fine Sediment Silt	- Relatively quick and easy - Recommended for short cores in soft sediment - Relatively undisturbed samples - Small sample volume - Sampler generally deployed from a boat - Equipment is heavy

Adapted from Tetra Tech EM, Inc. Literature Review and Report of Surface-Sediment Sampling Technologies, 2003; and Ohio EPA's Sediment Sampling Guide and Methodologies, 2001.

ATTACHMENT D

Field Forms

HULL

GEOTECHNICAL/MATERIALS TESTING LABORATORY
CHAIN OF CUSTODY RECORD

Report To:	**Date Due:**
Client*:	
Site*:	
Project Name*:	
Project Number*:	
Sampler(s):	

Silt/Clay Micron Break:
□ 2µm □ 5µm

*Write information exactly as it will be shown on final soils report

SAMPLE TYPE:
J - JAR
B - BUCKET
ST - SHELBY TUBE
BAG - BAG
L - LINERS
RC - Rock Core Box

HULL Lab # (assigned by lab)	Sample Date	Location	Sample No.	Depth	Sample Type	Moisture Content (D2216)	Atterberg Limits (D4318)	Hydrometer/Sieve (D422)	Complete USCS Classifacation	Specific Gravity (D854)	Proctor (STD / Modified)			

Comments:

Relinquished By:	Date:		Recieved By:	Date:
	Time:			Time:
Relinquished By:	Date:		Recieved By:	Date:
	Time:			Time:
Relinquished By:	Date:		Received By Lab:	Date:
	Time:			Time:

☐ CHECKED BY: □ APPROVED BY: □ BILLED BY:

4 Hemisphere Way
Bedford, OH 44146
440.232.9945

HULL

GEOTECHNICAL/MATERIALS TESTING LABORATORY
CHAIN OF CUSTODY RECORD

Client*:

Site*:

Project Name*:

Project Number*:

Sampler(s):

**Write information exactly as it will be shown on final soils report*

SAMPLE TYPE:
J - JAR
B - BUCKET
ST - SHELBY TUBE
BAG - BAG
L - LINERS
RC - Rock Core Box

HULL Lab # (assigned by lab)	Sample Date	Location	Sample No.	Depth	Sample Type	Moisture Content (D2216)	Atterberg Limits (D4318)	Hydrometer/Sieve (D422)	Complete USCS Classifcation	Specific Gravity (D854)	Proctor (STD / Modified)			

4 Hemisphere Way
Bedford, OH 44146
440.232.9945

HULL & ASSOCIATES, INC. **TEST PIT FIELD LOG**

LOCATION OF TEST PIT: 			PROJ NO:				LOCATION:			
			CLIENT:							
			PROJECT:					TEST PIT NO:		
			EQUIPMENT TYPE:					PAGE		
WEATHER:			SAMPLING METHOD:					OF		
CONTRACTOR:			WATER LEVEL FROM:				START/FINISH			
LOGGED BY:		DATE:	TIME:				TIME:	TIME:		
CHECKED BY:		DATE:	DATE:				DATE:	DATE:		
DATUM:		ELEVATION:	DEPTH:							

SMPL. No./DEPTH			DEPTH IN FEET	SAMPLE	SOIL GRAPH	NOTES (SURFACE CONDITION, LAB SOIL SAMPLE NUMBERS, SOIL DRUMS, ETC.):
			1			
			2			
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

TEST PIT COMPLETION		
MATERIAL:		
SURFACE MATERIAL:		
SEDDING:		

HULL & ASSOCIATES, INC. **SOIL BORING / MONITORING WELL FIELD LOG**

LOCATION OF BORING:

PROJ No: | CLIENT: | LOCATION:

PROJECT:

DRILLING METHOD: | SB/MW No:

SAMPLING METHOD:

FID MODEL,CALIB.,BACKGR: | SHEET

WEATHER: | PID MODEL: | PID CALIBRATION: | 1 OF

CONTRACTOR: | WATER LEVEL FROM: | DRILLING START/FINISH

LOGGED BY: | DATE: | TIME: | TIME: | TIME:

CHECKED BY: | DATE: | DATE: | DATE: | DATE:

DATUM: | ELEVATION: | DEPTH: | AIR MONITORING

SAMPLER TYPE	DRV./REC.	SMPL. No./DEPTH	BLOW COUNTS	PID/FID (ppm)	DEPTH IN FEET	SAMPLE	SOIL GRAPH	WELL	NOTES (SURFACE CONDITION, LAB SOIL SAMPLE NUMBERS, SOIL DRUMS, ETC.):	TIME	FID	LEL
					1							
					2							
					3							
					4							
					5							
					6							
					7							
					8							
					9							
					10							
					11							
					12							
					13							
					14							
					15							
					16							
					17							
					18							
					19							
					20							

MONITORING WELL CONSTRUCTION	CONCRETE SEAL:	SOIL BORING COMPLETION
SURFACE PROTECTOR:	GROUT:	MATERIAL:
RISER:	BENTONITE SEAL:	SURFACE MATERIAL:
SCREEN:	SAND PACK:	

SAMPLES SENT TO LABORATORY:

APPENDIX B

Beneficial Use Characterization Report

BENEFICIAL USE CHARACTERIZATION REPORT

FOR THE:

ROCKY RIDGE MINED AREA ON-SITE SOILS AND CITY OF TOLEDO ~~SPENT LIME~~DRINKING WATER TREATMENT MATERIAL

14591 W. TOUSSAINT NORTH
GRAYTOWN, OTTAWA COUNTY, OHIO

PREPARED FOR:

ROCKY RIDGE DEVELOPMENT, LLC
3793 SILICA RD
SYLVANIA, OH 43560

PREPARED BY:

HULL & ASSOCIATES, INC.
3401 GLENDALE AVE SUITE 300
TOLEDO, OHIO 43614

JULY 2016

HULL

BENEFICIAL USE CHARACTERIZATION REPORT

ROCKY RIDGE MINED AREA ON-SITE SOILS AND CITY OF TOLEDO ~~SPENT LIME~~DRINKING WATER TREATMENT MATERIAL

FOR THE:
ROCKY RIDGE MINED AREA ~~ON-SITE SOILS AND CITY OF TOLEDO SPENT LIME~~
14591 W. TOUSSAINT NORTH
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JULY 2016

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1.0 INTRODUCTION

Hull & Associates, Inc. (Hull) was contracted by Rocky Ridge Development, LLC (Rocky Ridge) to complete a beneficial use characterization study of the on-site soils and City of Toledo drinking water treatment material (DWTM), mainly consisting of lime. ~~spent lime.~~ This report provides the results of the chemical and geotechnical laboratory testing of proposed materials to be used during the ~~spent lime~~DWTM beneficial use project at the Rocky Ridge Mined area located at 14591 W. Toussaint North in Graytown, Ottawa County, Ohio, as shown in Figure 1 (Site).

The Site plans to receive, blend, and place soil/~~lime~~DWTM materials at the Site within the footprint of a former mine. ~~Lime~~DWTM will be transported from nearby areas to the Site. Hull is currently preparing an Integrated Alternative Waste Management Plan (IAWMP) for the placement of the blended material in the former mining area. Regional soils will be utilized with the imported ~~lime~~DWTM to create the blended material.

This characterization report focuses on summarizing:

- chemical testing completed to demonstrate the acceptability of the material for use in the proposed project;
- geotechnical laboratory testing completed obtain a better understanding of the relevant engineering properties of the proposed fill materials and provide geotechnical information to support construction (earthwork) planning and design considerations; and
- hydrologic modeling completed to gain an understanding on the effect of dewatering the mined area on the surrounding area as well as to estimate the aquifer rebound after the mined area is filled with a less permeable material (i.e., soil/~~lime~~DWTM blend).

2.0 ~~SPENT LIME~~DWTM, SOIL, AND SOIL/~~LIME~~DWTM BLEND CHARACTERIZATION

2.1 Overview

2.1.1 ~~Spent Lime~~DWTM Characterization

Chemical characterization of the ~~spent lime~~DWTM within Lagoons D and E was completed to evaluate analytes present. Totals analyses were completed and the most conservative sample identified based on the presence and concentrations of analytes. This sample was then used to create the different soil/~~lime~~DWTM blends to demonstrate that the blended material is suitable for use in the proposed project.

2.1.2 On-Site Soil Characterization

On-Site soils were also sampled at Rocky Ridge from four (4) locations and geotechnical analyses completed. No chemical analyses were completed on the native on-site soils; however, the geotechnical results were used to select one on-site soil sample to use to create the blends along with the one ~~spent lime~~DWTM sample that was determined to conservatively have the highest concentrations of analytes analyzed.

2.1.3 On-Site Soil/~~Lime~~DWTM Blend Characterization

The following three soil/~~lime~~DWTM blends were selected for the testing program and three replicates of each blend were prepared using the selected ~~spent lime~~DWTM and on-site soil sample:

- 50% Native Soil and 50% ~~Spent Lime~~DWTM
- 67% Native Soil and 33% ~~Spent Lime~~DWTM
- 33% Native Soil and 67% ~~Spent Lime~~DWTM

Raw ~~spent lime~~DWTM samples from the lagoons and the soil/~~lime~~DWTM blend sample data were compared to five relatively arbitrary standards/screening values (listed in general order of conservativeness – least to most):

- Ohio Voluntary Action Program (VAP) Residential Land Use
- Ohio VAP Generic Leach-Based Soil Values for Soil Class III for source ≥1/2 acre
- USEPA Region 9 Regional Screening Levels (RSL) Direct Contact Residential RSL
- USEPA Region 9 Protection of Groundwater Resident Soil to Groundwater Soil Screening Level (SSL) – Maximum Contaminant Level (MCL)
- USEPA Region 9 Protection of Groundwater Resident Soil to Groundwater Soil Screening Level (SSL) – Risk-Based Level

In addition, select total metal results were compared to the published background metal information for Lucas County, as there is no background study for Ottawa County.

Following the review of the totals data, one samples of each blend was selected based on the presence and concentration of analytes and analyzed for Synthetic Leaching Soil Procedure (SPLP). The objective of this analysis is to simulate material sitting in-situ exposed to rainfall (with an assumption that the rainfall is slightly acidic) and then evaluate the organic and inorganic analytes present. Generally, the SPLP method simulates environmental precipitation and the leaching potential of a contaminant in soil, and offers a method to assess chemical mobility in the environment.

The ~~Spent Lime~~DWTM and On-Site Soil Characterization and Blending Study methodology and results are discussed in detail in Section and Section 4, respectively.

2.2 Methods and Approach

Rocky Ridge completed the lagoon and on-site soil sampling between April 7, 2016 and April 26, 2016. A Field Sample and Analysis Plan (FSAP) was prepared to guide Rocky Ridge with sampling methods. The FSAP is provided in Appendix A.

Three composite samples of ~~spent lime~~DWTM were collected from three locations in Lagoon D and Lagoon E, for a total of six (6) samples, as shown on Figure 2. Once the analytical laboratory sample jars were filled, remaining ~~spent lime~~DWTM from each sample location was composited per lagoon such that there were at least five (5) 5-gallon buckets per lagoon to be shipped to the geotechnical laboratory for blending with soil. Representative samples were collected and homogenized prior to shipping to the geotechnical laboratory. Additionally, four (4) locations of on-site native soils were sampled from Rocky Ridge and shipped to the geotechnical laboratory for use in creating blends of ~~lime~~DWTM and soil.

Chemical samples were shipped to ALS Laboratory and analyzed for various total constituents including metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCBs), and organics.

Hull's geotechnical laboratory received and processed the native soil and ~~spent lime~~DWTM samples collected by Rocky Ridge. Moisture content as-received by the laboratory (ASTM D2216), liquid and plastic limits (Atterbergs, ASTM D4318), and grain-size analysis (ASTM D422, AASHTO T88) was performed on each native soil sample to classify them according to the United Soils Classification System (USCS).

Based on the similarity of the grain size distribution and plasticity characteristics, one native sample location was used in the blending phase of the laboratory testing. As a conservative approach, soil sample location

2 was selected due to the material having the least percentage of clay and lowest range of moisture content in which the material exhibits plasticity characteristics (i.e., lowest plasticity index value), suggesting the material will have the highest hydraulic conductivity/permeability. Based on the chemical results of the ~~lime~~DWTM material, as discussed below in Section 4, ~~spent lime~~DWTM from Sample E-2 was utilized in the blends. It was important to use material from a single source for all sample blends so the test results would have a single independent variable (i.e., blend ratio) and test results would not be skewed. The following three soil/~~lime~~DWTM blends were selected for the testing program:

- 50% Native Soil and 50% ~~Lime~~DWTM
- 67% Native Soil and 33% ~~Lime~~DWTM
- 33% Native Soil and 67% ~~Lime~~DWTM

In order to best replicate the blending technique in the field, the native soils and ~~lime~~DWTM were blended by bulk volume (water was decanted off the ~~lime~~DWTM material but was not dried-this would replicate what will happen during the actual blending process in the field). This was done to simulate construction methods. Samples were tested for the Standard Proctor Method (ASTM D698), Specific Gravity (ASTM D854), and Flexible Wall Permeability (ASTM D5084). The samples were prepared and dry prepped for subsequent Proctor testing following blending of the soil and ~~lime~~DWTM to ensure the proper blending ratios were achieved These blends were also shipped to the analytical laboratory for chemical evaluation.

2.3 Data Quality Assessment

The data was evaluated and determined to be of sufficient quality for evaluation. The determination is based on the completion of data verification and validation procedures and data quality performance criteria established by the sampling plan. Data verification consisted of reviewing field data and documentation for transcription errors. Appropriate types of samples were collected and analyzed for the appropriate parameters based on a comparison of the field sample chain of custody record, the sampling plan, and the laboratory analytical report. Field custody records were checked against the work plan to determine that the appropriate samples were collected. Similarly, the custody records were checked against the analytical data generated by the laboratory to determine that all requested analyses were completed.

Results of the data verification and data validation indicate that the proper data quality assurance procedures were followed per the work plan. The overall data quality was assessed with respect to performance criteria in terms of precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS).

No parameters were reported at, or above, the laboratory reporting limit in the field/equipment blank or in the laboratory method blank. Data indicate that field, transportation, and laboratory conditions have not biased the sample data. The field duplicate, laboratory control, matrix spike, and matrix spike duplicate samples meet the acceptance criteria established in the work plan, other than those noted in the laboratory reports provided in Appendix B.

2.4 Characterization Results

2.4.1 ~~Spent Lime~~DWTM Characterization Results

Table 1 presents the chemical results of the lagoon ~~spent lime~~DWTM samples. No parameters from the ~~lime~~DWTM samples exceeded the Ohio VAP standards. Five metals exceeded one or more of the USEPA Region 9 screening levels, however all but one metal (selenium) were below background for Lucas County. There is no established background concentration for selenium in Lucas County. One PCB congener was reported from one sample point in Lagoon D. Lagoon E had six PAHs that exceeded one or more USEPA Region 9 levels. Sample E-2 was determined to be the most conservative sample based on the analyte concentrations present and therefore was used to create the soil/~~lime~~DWTM blends.

2.4.2 On-Site Soils Characterization Results

The four native on-Site soil samples tested can be described as a lean clay with sand or a lean clay and classified with the USCS group symbol of "CL". As expected, the maximum dry density decreased, with an increasing percentage of ~~lime~~DWTM. The optimum moisture content of the blended material was also relatively consistent – the higher the maximum dry density, the lower the optimum moisture content. As previously mentioned, the blends were mixed by volume, not by weight, and thus should be comparable to how the material will be handled and blended by construction equipment on-Site (i.e., with an excavator bucket).

A Summary of Geotechnical Laboratory Testing Results with more detailed results and discussion is included in Appendix C.

2.4.3 ~~Spent Lime~~DWTM/On-Site Soil Blend Characterization Results

Table 2 presents the chemical results of the soil/~~lime~~DWTM blend samples. No parameters reported above the method detection limits (MDL) exceeded the Ohio VAP standards. Two metals, arsenic and thallium, exceeded one or more of the USEPA Region 9 levels, however thallium results were below background for Lucas County and arsenic was generally similar to background, with samples exceeding Lucas County background marginally.

For the 33/67 soil/~~lime~~DWTM blend parameters detected above the MDL, in addition to arsenic and thallium exceedances, one of the three samples exceeded the RSL for benzo(a)pyrene. Some metals exceeded the Soil to Groundwater SSL MCL levels but no other parameters exceeded the Soil to Groundwater SSL MCL. Cyanide exceeded the Soil to Groundwater RBL in all three samples, and one sample exceeded the RBL for benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene.

For the 50/50 soil/~~lime~~DWTM blend parameters detected above the MDL, in addition to arsenic and thallium exceedances, one of the three samples exceeded the RSL for benzo(a)pyrene. Some metals exceeded the Soil to Groundwater SSL MCL levels but no other parameters exceeded the Soil to Groundwater SSL MCL. Cyanide exceeded the Soil to Groundwater RBL in all three samples, and one sample exceeded the RBL for benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene.

For the 67/33 soil/~~lime~~DWTM blend parameters detected above the MDL, only arsenic and thallium exceeded the RSL. No other parameters exceeded the RSLs. Some metals exceeded the Soil to Groundwater SSL MCL levels but no other parameters exceeded the Soil to Groundwater SSL MCL. Cyanide exceeded the Soil to Groundwater RBL in all three samples, and one sample exceeded the RBL for 4,6-dinitro-o-cresol.

Note that many parameters for the blends (e.g., some metals, cyanide, some PAHs) had method detection limits (MDL) much lower than the parent ~~lime~~DWTM sample. Interferences such as extract color and/or high concentrations of a particular analyte in sample batches can influence the MDL such that the MDL must be adjusted higher. As a result, it is likely that these constituents are present in the parent sample at low levels below the MDL, however due to interferences at the time of analysis the concentrations cannot be determined.

Many of the MDLs are higher than some of the screening levels, specifically the Soil to Groundwater screening levels, which have very low concentrations. However, based on the Ohio VAP and RSLs, the 66/33 blend did not exceed these screening levels and the 50/50 blend had one sub-sample that exceeded benzo(a)pyrene.

Table 3 presents the results of the SPLP analyses. No parameters were detected above the screening level in any of the blend samples.

3.0 LIMITED HYDROGEOLOGICAL MODEL

3.1 Overview

To determine the potential water table drawdown associated with mined area dewatering operations conducted at the Site, Hull subcontracted In Aquas Veritas to construct and evaluate a computer-based numerical simulation of the Site and its surrounding area. The simulation of the projected groundwater depression, and subsequent rebound, was conducted using Waterloo Hydrogeologic's Visual MODFLOW (version 4.3). Visual MODFLOW is a well-known three-dimensional groundwater flow model that uses code originally developed by the USGS (MODFLOW). MODFLOW is a finite-difference groundwater flow model, which can accommodate anisotropic, heterogeneous aquifers in two or three-dimensional domains. The model allows transient flow simulations, and can handle confined, semi-confined, or unconfined conditions under active pumping or variable natural flow regimes. The modeling methodology and results are discussed below.

Three separate model scenarios were constructed and evaluated:

A. A calibration scenario in which current dewatering rates were simulated in the model, following which model results were compared to measured drawdown kinetics in the mined area itself and surrounding monitoring wells. This step was used to ascertain the Site's aquifer hydraulic properties.

B. A projected future area drawdown scenario in which modeled mined area dewatering rates were adjusted from the initial dewatering rates to the lower rates needed only to maintain a dry mined area. This scenario was run out to steady-state conditions and the resulting drawdown in the water table in the area surrounding the mined area was evaluated. Intermediate drawdown levels between the initial dewatering activities and equilibrium conditions were also calculated.

C. A rebound scenario in which dewatering was terminated and groundwater was allowed to return to background water table conditions. In this scenario, prior to cessation of the simulated dewatering activities, the modeled mined area was filled with low-conductivity material to evaluate intra-mined area flow velocities if the mined area were "plugged". Several fill material hydraulic conductivities were simulated in this scenario to provide a basis for comparison to the variety of proposed "plug" materials being considered for this phase of the project.

The Model Summary Report is provided in Appendix D.

3.2 Model Design

Site stratigraphy was represented in the model through the use of 10 layers, collectively representing two primary lithologic units at the Site. These included an unconsolidated upper clay unit, and a lower limestone/dolomite bedrock unit. While the actual bedrock stratigraphy of the Site is complex, little is known

about the individual hydrogeologic properties of the various stratigraphic layers. The layers in the model were used as follow:

Layer 1	Clay/uppermost bedrock unit
Layer 2	Uppermost portion of bedrock – a thin model layer used to contain river cells.
Layers 3 - 6	Bedrock layers between Layer 2 and the drain layer. These layers, along with layer 2, represent the quarried interval of the subsurface.
Layer 7	A thin bedrock layer used to contain drain cells.
Layer 7-10	Bedrock layers beneath the quarried interval and the model basement.

Surface topography was imported into the model from USGS Digital Elevation Model (DEM) data, associated with the USGS Oak Harbor, Ohio topographic quadrangle map.

3.3 Model Simulations and Results

3.3.1 Drawdown Simulation

The model was used to estimate the time needed to completely dewater the mined area under existing pumping rates as well as estimate the total drawdown in the area of the mined area under continued dewatering activities. In order to estimate the time needed to dewater the mined area, the model was run until the modeled recovery well ran dry. This occurred after approximately 280 model days, following which the model would not converge due to the repeated wetting/drying of the model cells associated with the recovery well. The model determined a drawdown rate of 0.05 meters per day (0.16 ft./day), within the range of what has been physically measured at the mined area to date (0.15 – 0.20 ft./day). Given a starting water table elevation of 175 meters and a mined area floor of 153 meters, the completed drawdown should be achieved in approximately 1.2 years at this groundwater extraction rate.

The drawdown curves indicate that most of the expected drawdown will occur within the first three years of dewatering activities at the mined area, but also that drawdown values of up to about 7 meters could be achieved in nearby residential areas. Properties along Toussaint North Road and Route 590 will likely be most affected.

3.3.2 Rebound Simulation

Based on the model, the rebound of the water table to background conditions will take several years to complete. Initial rebound of the water table will be relatively rapid due to the significant head difference between the surrounding aquifer and the mined area floor. As the external and internal head values become more similar, the rate of rebound will be reduced. The model suggests that full background conditions will be achieved within approximately 5 years, although 75% of background should be reached within approximately 1 year at the mined area location.

4.0 SUMMARY

Based on the results of the laboratory testing, it appears the ~~lime~~DWTM, soil, and blended materials are suitable for their intended use as fill material at the Site. The native soil is a lean clay and a lean clay with sand (CL) of moderate plasticity. Once blended with the ~~lime~~DWTM, the blended material at all three blends appear to be a compactable material with relatively low permeability. Therefore, the blended material at all three blends can be considered suitable for use in the beneficial use application at the Site.

In general, concentrations of organics were lower as the blends increased in on-site soil. The most conservative blend sample (Sample 66/33-3) had the same analytes present as the parent ~~lime~~DWTM sample Lagoon E-2. Metal concentrations were generally lower in the ~~lime~~DWTM samples compared to the blends, indicating the on-site soils had higher metal concentrations compared to the ~~lime~~DWTM sample. The most conservative blend sample did not exceed any Ohio VAP standards but exceeded 10 of the 15 USEPA RSLs. While some metals exceeded the USEPA RSLs, all but thallium were below applicable background. Thallium was below the MDL but had a higher detection limit in the Lagoon E-2 sample compared to the soil:~~lime~~DWTM blend samples. The most conservative blend sample also had lower PAH concentrations compared to the Lagoon E-2 sample.

No parameters were detected above the screening level in any of the blend samples for the SPLP method and hydrogeological modeling suggest that impacts to groundwater are not expected. Groundwater is expected to rebound following drawdown.

5.0 REFERENCES

A variety of technical manuals, administrative documents, and publications were referred to in preparing this document. Some of the references consulted are presented below. Referenced documents and publications may or may not have been reviewed in their entirety. The guidelines and procedures presented in the documents and publications referenced have been adhered to unless stated otherwise.

Ohio EPA Workgroup. *Evaluation of Background Metal Soil Concentrations in Lucas County – Toledo Area Summary Report for Ohio EPA's Voluntary Action Program*. March 2014.

TABLES

ROCKY RIDGE QUARRY

TABLE 1

SUMMARY OF DWTM TOTAL SAMPLE RESULTS

Parameters	CASNumber	Units	2014 VAP Residential Generic Direct Contact	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater MCL based SSL THQ=1.0	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater MCL based SSL THQ=0.1	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater Risk based SSL THQ=1.0	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater Risk based SSL THQ=0.1	Nov 2015 Residential Soil RSLs THQ=0.1	Nov 2015 Residential Soil RSLs THQ=1.0	Ohio Background Metals (Lucas County, Ohio; Less than 50% Sand)	VAP Generic Leach-Based Soil Values Soil Class III for source ≥1/2 acre	Station Name	E1	E2	E3	D-1	D-1	D-2	D-3
													0 - 18 ft.	0 - 16 ft.	0 - 16 ft.	0 - 13 ft.	0 - 13 ft.	0 - 13 ft.	0 - 9 ft.
												Sample Date	4/26/2016	4/26/2016	4/26/2016	4/7/2016	4/7/2016	4/9/2016	4/9/2016
												FieldSampleID	RCK001: E1: D000180	RCK001: E2: D000160	RCK001: E3: D000160	RCK001: D-1: D000130	RCK001: D-1: D000130A	RCK001: D-2: S000130	RCK001: D-3: S000090
A4500-Cl E-97																			
Chloride	16887-00-6	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**160**	**120**	**99**	**28**	**28**	**59**	**37**
A4500-NH3 G-97																			
Ammonia as Nitrogen	7664-41-7	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**310**	**100 j**	**78 j**	**46 b**	**180**	**57**	**44**
Nitrogen, Total Kjeldahl		mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**1500**	**1300**	**1200**	**210**	**130**	**300**	**290**
A4500-NO2 B																			
Nitrite	14797-65-0	mg/kg	NS	NS	NS	NS	NS	780	7,800	NS	NS		<4.9	<3.8	<3.4	**0.042 j**	**0.028 j**	**0.023 j**	<2
A4500-P E-97																			
Phosphorus, Ortho-P	14265-44-2	mg/kg	3.1	NS	NS	NS	NS	NS	NS	NS	NS		<9.3	<7.3	<5.7	**57**	**56**	**30**	**41**
A5210B-97																			
Biochemical Oxygen Demand		mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**500**	**140**	**140**	<24.05	<23.91	<28	<28
Calculation																			
Nitrogen	7727-37-9	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**1500**	**1300**	**1200**	**170**	**130**	**310**	**280**
Nitrogen, Total Inorganic	7727-37-9	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**310**	**1300**	**1200**	**46**	**190**	**56**	**43**
Nitrogen, Total Organic	7727-37-9	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**1200**	**1200**	**1200**	**170**	<2.1	**250**	**240**
E353.2																			
Nitrate	14797-55-8	mg/kg	NS	NS	NS	NS	NS	13,000	130,000	NS	NS		**3 j**	**1.7 j**	**2.4 j**	<1.8	**0.5 j**	<2.6	**0.38 j**
Nitrate-Nitrite as Nitrogen	7727-37-9	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**3.2 j**	**2 j**	**2.6 j**	**0.36 j**	**0.51 j**	<2.6	**0.25 j**
E365.1 R2.0																			
Phosphorus	7723-14-0	mg/kg	3.1	NS	NS	0.00148	0.000148	NS	NS	NS	NS		**300**	**360**	**330**	**2100**	**2000**	**1500**	**1800**
E410.4 R2.0																			
Chemical Oxygen Demand		mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<5700	<3600	**560 j**	**290 j**	**430 j**	**430 j**	**490 j**
SW3550C																			
Percent Moisture		%	NS	NS	NS	NS	NS	NS	NS	NS	NS		**87**	**83**	**81**	**54**	**53**	**65**	**65**
SW6020A																			
Antimony	7440-36-0	mg/kg	63	0.271	0.271	0.352	0.0352	3.1	31	NS	3.6		<26	<23	<16	<7.7	<7.4	<9.4	<11
Arsenic	7440-38-2	mg/kg	12	0.292	0.292	0.00151	0.00151	0.68	0.68	9.7	3		**4.5 j**	**4.7 j**	**3.4 j**	<7.7	<7.4	<9.4	<11
Beryllium	7440-41-7	mg/kg	310	3.16	3.16	19.5	1.95	16	160	NS	57		<10	<9.3	**0.29 j**	**0.14 j**	<3	**0.23 j**	<4.5
Cadmium	7440-43-9	mg/kg	140	0.376	0.376	0.693	0.0693	7.1	71	23.2	21		<10	<9.3	<6.6	**0.21 j**	**0.13 j**	**0.26 j**	<4.5
Chromium	7440-47-3	mg/kg	NS	180,000	180,000	180,000	NS	NS	NS	12.1	56		**7 j**	**5.9 j**	**5.1 j**	**1.7 j**	**1.7 j**	**2.9 j**	**2.6 j**
Copper	7440-50-8	mg/kg	6,300	45.8	45.8	28.1	2.81	310	3,100	NS	NS		**9.8 j**	**9.4 j**	**8.7 j**	**4.6 j**	**4.4 j**	**6.1 j**	**4.9 j**
Lead	7439-92-1	mg/kg	400	13.5	13.5	13.5	NS	400	400	17	89		**4.6 j**	**4.1 j**	**3.9 j**	**1.7 j**	**1.8 j**	**3.1 j**	**2.2 j**
Magnesium	7439-95-4	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**38000**	**30000**	**27000**	**14000**	**13000**	**19000**	**15000**
Nickel	7440-02-0	mg/kg	3,100	NS	NS	25.6	2.56	150	1,500	28.5	182		**13 j**	**11 j**	**11 j**	**7.3 j**	**7.2 j**	**9.3 j**	**7.8 j**
Potassium	7440-09-7	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**800 j**	**940 j**	**780**	**250 j**	**330**	**400**	**360 j**
Selenium	7782-49-2	mg/kg	780	0.26	0.26	0.519	0.0519	39	390	NS	2.15		<26	<23	<16	<7.7	<7.4	<9.4	**1.9 j**
Silver	7440-22-4	mg/kg	780	NS	NS	0.799	0.0799	39	390	NS	3120		<26	<23	<16	<7.7	<7.4	<9.4	<11
Sodium	7440-23-5	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**330 j**	**300 j**	**240 j**	**240 j**	**240 j**	**400**	**340 j**
Thallium	7440-28-0	mg/kg	NS	0.142	0.142	0.0142	0.00142	0.078	0.78	0.44	1.5		<26	<23	<16	**0.3 j**	<7.4	**0.43 j**	<11
Zinc	7440-66-6	mg/kg	47,000	NS	NS	373	37.3	2,300	23,000	NS	44,000		**44 j**	**27 j**	**24 j**	**10 j**	**11 j**	**16 j**	**21 j**
SW7471A																			
Mercury	7439-97-6	mg/kg	3.1	0.104	0.104	0.0327	0.00327	1.1	11	0.045	12		**0.032 j**	**0.024 j**	**0.023 j**	**0.0077 j**	**0.011 j**	**0.018 j**	**0.0087 j**
SW9012B																			
Total Cyanide	57-12-5	mg/kg	NS	2.02	2.02	0.0148	0.00148	0.27	2.7	NS	NS		<3.3	<2.4	<2.2	**0.026 j**	**0.075 j**	**0.11 j**	**0.053 j**
SW9045D																			
pH	NS	s.u.	NS	NS	NS	NS	NS	NS	NS	NS	NS		**9.4**	**9.3**	**9.3**	**8.8**	**8.8**	**9.3**	**9**
TITRAMETRIC																			
Organic Carbon - W-B	7727-37-9	%	NS	NS	NS	NS	NS	NS	NS	NS	NS		**3.5**	**3.5**	**3.4**	**0.61**	**0.56**	**0.77**	**0.75**

Notes

NS = No Standard

Exceeds one or more screening/standards

Bold indicates detection above the Method Detection Limit

ROCKY RIDGE QUARRY

TABLE 1

SUMMARY OF DWTM TOTAL SAMPLE RESULTS

Parameters	CASNumber	Units	2014 VAP Residential Generic Direct Contact	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater MCL based SSL THQ=1.0	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater MCL based SSL THQ=0.1	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater Risk based SSL THQ=1.0	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater Risk based SSL THQ=0.1	Nov 2015 Residential Soil RSLs THQ=0.1	Nov 2015 Residential Soil RSLs THQ=1.0	Ohio Background Metals (Lucas County, Ohio; Less than 50% Sand)	VAP Generic Leach-Based Soil Values Soil Class III for source ≥1/2 acre	Station Name	E1	E2	E3	D-1	D-1	D-2	D-3
													0 - 18 ft.	0 - 16 ft.	0 - 16 ft.	0 - 13 ft.	0 - 13 ft.	0 - 13 ft.	0 - 9 ft.
												Sample Date	4/26/2016	4/26/2016	4/26/2016	4/7/2016	4/7/2016	4/9/2016	4/9/2016
												FieldSampleID	RCK001: E1: D000180	RCK001: E2: D000160	RCK001: E3: D000160	RCK001: D-1: D000130	RCK001: D-1: D000130A	RCK001: D-2: S000130	RCK001: D-3: S000090
SW8081A																			
Aldrin	309-00-2	mg/kg	0.57	NS	NS	0.000151	0.000151	0.039	0.039	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
alpha-Chlordane	5103-71-9	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
Chlordane	57-74-9	mg/kg	32	0.136	0.136	0.00304	0.00304	1.7	1.7	NS	NS		<0.68	<0.36	<0.37	<0.8	<0.51	<0.2	<0.14
DDD	72-54-8	mg/kg	40	NS	NS	0.00746	0.00746	2.3	2.3	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
DDE	72-55-9	mg/kg	29	NS	NS	0.0109	0.0109	2	2	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
DDT	50-29-3	mg/kg	34	NS	NS	0.0773	0.0773	1.9	1.9	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
delta-BHC	319-86-8	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
Dieldrin	60-57-1	mg/kg	0.61	NS	NS	0.0000708	0.0000708	0.034	0.034	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
Endosulfan I	959-98-8	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
Endosulfan II	33213-65-9	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
Endosulfan Sulfate	1031-07-8	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
Endrin	72-20-8	mg/kg	37	0.0808	0.0808	0.0922	0.00922	1.9	19	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
Endrin aldehyde	7421-93-4	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
Heptachlor	76-44-8	mg/kg	2.2	0.0331	0.0331	0.000115	0.000115	0.13	0.13	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
Heptachlor Epoxide	1024-57-3	mg/kg	1.1	0.00408	0.00408	0.0000284	0.0000284	0.07	0.07	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
Hexachlorocyclohexane, Alpha-	319-84-6	mg/kg	1.5	NS	NS	0.0000421	0.0000421	0.086	0.086	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
Hexachlorocyclohexane, Beta-	319-85-7	mg/kg	5.4	NS	NS	0.000147	0.000147	0.3	0.3	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	mg/kg	10	0.00116	0.00116	0.000241	0.000241	0.57	0.57	NS	NS		<0.27	<0.15	<0.15	<0.32	<0.21	<0.079	<0.055
Toxaphene	8001-35-2	mg/kg	8.8	0.464	0.464	0.0109	0.0109	0.49	0.49	NS	NS		<1.6	<0.87	<0.9	<1.9	<1.2	<0.48	<0.33
SW8082																			
Aroclor 1016	12674-11-2	mg/kg	7.9	NS	NS	0.0214	0.0134	0.41	4.1	NS	NS		<1.1	<0.61	<0.62	<0.27	<0.26	<0.33	<0.23
Aroclor 1221	11104-28-2	mg/kg	3.1	NS	NS	0.00008	0.00008	0.2	0.2	NS	NS		<1.1	<0.61	<0.62	<0.27	<0.26	<0.33	<0.23
Aroclor 1232	11141-16-5	mg/kg	3.1	NS	NS	0.00008	0.00008	0.17	0.17	NS	NS		<1.1	<0.61	<0.62	<0.27	<0.26	<0.33	<0.23
Aroclor 1242	53469-21-9	mg/kg	4.4	NS	NS	0.00123	0.00123	0.23	0.23	NS	NS		<1.1	<0.61	<0.62	<0.27	<0.26	<0.33	<0.23
Aroclor 1248	12672-29-6	mg/kg	4.4	NS	NS	0.0012	0.0012	0.23	0.23	NS	NS		<1.1	<0.61	<0.62	<0.27	<0.26	<0.33	<0.23
Aroclor 1254	11097-69-1	mg/kg	2.2	NS	NS	0.00205	0.00205	0.12	0.24	NS	NS		<1.1	<0.61	<0.62	<0.27	<0.26	**0.71**	<0.23
Aroclor 1260	11096-82-5	mg/kg	4.4	NS	NS	0.00549	0.00549	0.24	0.24	NS	NS		<1.1	<0.61	<0.62	<0.27	<0.26	<0.33	<0.23
SW8260B																			
1,1,1-Trichloroethane	71-55-6	mg/kg	640	0.0701	0.0701	2.81	0.281	810	8,100	NS	1.3		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	14	NS	NS	0.0000296	0.0000296	0.6	0.6	NS	NS		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
1,1,2-Trichloroethane	79-00-5	mg/kg	26	0.00162	0.00162	0.0000893	0.0000135	0.15	1.1	NS	NS		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
1,1-Dichloroethane	75-34-3	mg/kg	83	NS	NS	0.000782	0.000782	3.6	3.6	NS	NS		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
1,1-Dichloroethene	75-35-4	mg/kg	360	0.00251	0.00251	0.102	0.0102	23	230	NS	0.24		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
1,2-Dichlorobenzene	95-50-1	mg/kg	380	0.584	0.584	0.295	0.0295	180	1,800	NS	NS		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
1,2-Dichloroethane	107-06-2	mg/kg	11	0.00142	0.00142	0.0000484	0.0000484	0.46	0.46	NS	0.003		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
1,2-Dichloropropane	78-87-5	mg/kg	23	0.00166	0.00166	0.000145	0.000145	1	1	NS	NS		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
1,3-Dichlorobenzene	541-73-1	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
1,4-Dichlorobenzene	106-46-7	mg/kg	61	0.072	0.072	0.000462	0.000462	2.6	2.6	NS	NS		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
Acrolein	107-02-8	mg/kg	0.39	NS	NS	0.00000841	0.000000841	0.014	0.14	NS	NS		<2.9	<2.3	<2.5	<0.67	<0.65	<0.94	<1.1
Acrylonitrile	107-13-1	mg/kg	5.7	NS	NS	0.0000114	0.0000114	0.25	0.25	NS	NS		<1.4	<1.2	<1.2	<0.33	<0.33	<0.47	<0.54
Benzene	71-43-2	mg/kg	26	0.00256	0.00256	0.000233	0.000233	1.2	1.2	NS	0.015		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
Bromodichloromethane	75-27-4	mg/kg	6.8	0.0217	0.0217	0.0000365	0.0000365	0.29	0.29	NS	NS		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
Bromoform	75-25-2	mg/kg	1200	0.0212	0.0212	0.000873	0.000873	19	19	NS	NS		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
Bromomethane	74-83-9	mg/kg	18	NS	NS	0.00206	0.000191	0.68	24	NS	NS		<1.1	<0.88	<0.93	<0.25	<0.24	<0.35	<0.41
Carbon Tetrachloride	56-23-5	mg/kg	15	0.00194	0.00194	0.000177	0.000177	0.65	0.65	NS	0.28		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
Chlorobenzene	108-90-7	mg/kg	700	0.0679	0.0679	0.0528	0.00528	28	280	NS	NS		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
Chloroethane	75-00-3	mg/kg	2100	NS	NS	5.92	0.592	1,400	14,000	NS	NS		<1.4	<1.2	<1.2	<0.33	<0.33	<0.47	<0.54
Chloroform	67-66-3	mg/kg	7.4	0.0222	0.0222	0.0000612	0.0000612	0.32	0.32	NS	NS		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
Chloromethane	74-87-3	mg/kg	300	NS	NS	0.0486	0.00486	11	110	NS	NS		<1.4	<1.2	<1.2	<0.33	<0.33	<0.47	<0.54
cis-1,2-Dichloroethene	156-59-2	mg/kg	NS	0.0206	0.0206	0.0106	0.00106	16	160	NS	0.12		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
cis-1,3-Dichloropropene	10061-01-5	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
Dibromochloromethane	124-48-1	mg/kg	17	0.0213	0.0213	0.000232	0.000232	8.3	8.3	NS	NS		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
Ethylbenzene	100-41-4	mg/kg	130	0.785	0.785	0.00168	0.00168	5.8	5.8	NS	16		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
Methylene Chloride	75-09-2	mg/kg	750	0.00128	0.00128	0.00291	0.00272	35	57	NS	NS		<0.43	**0.52**	<0.37	<0.1	<0.098	<0.14	<0.16
Tetrachloroethene	127-18-4	mg/kg	170	0.00227	0.00227	0.00513	0.00184	8.1	24	NS	0.27		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
Toluene	108-88-3	mg/kg	820	0.692	0.692	0.762	0.0762	490	4,900	NS	7.7		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
trans-1,2-Dichloroethene	156-60-5	mg/kg	370	0.0313	0.0313	0.113	0.0113	160	1,600	NS	0.4		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
trans-1,3-Dichloropropene	10061-02-6	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
Trichloroethene	79-01-6	mg/kg	11	0.00179	0.00179	0.000176	0.000101	0.41	0.94	NS	0.048		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16
Vinyl Chloride	75-01-4	mg/kg	1.3	0.00069	0.00069	0.00000647	0.00000647	0.059	0.059	NS	0.012		<0.43	<0.35	<0.37	<0.1	<0.098	<0.14	<0.16

Notes

NS = No Standard

Exceeds one or more screening/standards

Bold indicates detection above the Method Detection Limit

ROCKY RIDGE QUARRY

TABLE 1

SUMMARY OF DWTM TOTAL SAMPLE RESULTS

Parameters	CASNumber	Units	2014 VAP Residential Generic Direct Contact	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater MCL based SSL THQ=1.0	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater MCL based SSL THQ=0.1	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater Risk based SSL THQ=1.0	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater Risk based SSL THQ=0.1	Nov 2015 Residential Soil RSLs THQ=0.1	Nov 2015 Residential Soil RSLs THQ=1.0	Ohio Background Metals (Lucas County, Ohio; Less than 50% Sand)	VAP Generic Leach-Based Soil Values Soil Class III for source ≥1/2 acre	Station Name	E1	E2	E3	D-1	D-1	D-2	D-3
													0 - 18 ft.	0 - 16 ft.	0 - 16 ft.	0 - 13 ft.	0 - 13 ft.	0 - 13 ft.	0 - 9 ft.
												Sample Date	4/26/2016	4/26/2016	4/26/2016	4/7/2016	4/7/2016	4/9/2016	4/9/2016
												FieldSampleID	RCK001: E1: D000180	RCK001: E2: D000160	RCK001: E3: D000160	RCK001: D-1: D000130	RCK001: D-1: D000130A	RCK001: D-2: S000130	RCK001: D-3: S000090
SW8270C																			
1,2-Diphenylhydrazine	122-66-7	mg/kg	12	NS	NS	0.00025	0.00025	0.68	0.68	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
2,4,6-Trichlorophenol	88-06-2	mg/kg	120	NS	NS	0.0154	0.00452	6.3	49	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
2,4-Dichlorophenol	120-83-2	mg/kg	370	NS	NS	0.0541	0.00541	19	190	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
2,4-Dimethylphenol	105-67-9	mg/kg	2,400	NS	NS	0.421	0.0421	130	1,300	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
2,4-Dinitrophenol	51-28-5	mg/kg	240	NS	NS	0.0436	0.00436	13	130	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
2,4-Dinitrotoluene	121-14-2	mg/kg	31	NS	NS	0.000321	0.000321	1.7	1.7	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
2,6-Dinitrotoluene	606-20-2	mg/kg	6.5	NS	NS	0.0000667	0.0000667	0.36	0.36	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
2-Chlorophenol	95-57-8	mg/kg	780	NS	NS	0.0742	0.00742	39	390	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
2-Nitrophenol	88-75-5	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
3,3-Dichlorobenzidine	91-94-1	mg/kg	22	NS	NS	0.000824	0.000824	1.2	1.2	NS	NS		<3.2	<2.9	<2.6	<0.7	<0.68	<1.9	<1.2
4,6-Dinitro-o-cresol	534-52-1	mg/kg	NS	NS	NS	0.00258	0.000258	0.51	5.1	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
4-Bromophenyl-phenylether	101-55-3	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
4-Chloro-3-methylphenol	59-50-7	mg/kg	12,000	NS	NS	1.71	0.171	630	6,300	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
4-Chlorophenyl-phenylether	7005-72-3	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
4-Nitrophenol	100-02-7	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Acenaphthene	83-32-9	mg/kg	6,900	NS	NS	5.49	0.549	360	3600	NS	NS		<0.13	**0.11 j**	<0.1	<0.028	<0.027	<0.076	<0.047
Acenaphthylene	208-96-8	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.13	<0.12	<0.1	<0.028	<0.027	<0.076	<0.047
Anthracene	120-12-7	mg/kg	34,000	NS	NS	58.1	5.81	1,800	18,000	NS	NS		<0.13	**0.22**	<0.1	<0.028	<0.027	<0.076	<0.047
Benzidine	92-87-5	mg/kg	0.042	NS	NS	0.00000028	0.00000028	0.00053	0.00053	NS	NS		<13	<12	<10	<0.7	<0.68	<1.9	<1.2
Benzo(a)anthracene	56-55-3	mg/kg	12	NS	NS	0.00425	0.00425	0.16	0.16	NS	NS		<0.13	**0.29**	<0.1	<0.028	<0.027	<0.076	<0.047
Benzo(a)pyrene	50-32-8	mg/kg	1.2	0.235	0.235	0.00403	0.00403	0.016	0.016	NS	NS		<0.13	**0.33**	<0.1	<0.028	<0.027	<0.076	<0.047
Benzo(b)fluoranthene	205-99-2	mg/kg	12	NS	NS	0.0411	0.0411	0.16	0.16	NS	NS		<0.13	**0.4**	<0.1	<0.028	<0.027	<0.076	<0.047
Benzo(g,h,i)perylene	191-24-2	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.13	**0.19**	<0.1	<0.028	<0.027	<0.076	<0.047
Benzo(k)fluoranthene	207-08-9	mg/kg	120	NS	NS	0.403	0.403	1.6	1.6	NS	NS		<0.13	**0.16**	<0.1	<0.028	<0.027	<0.076	<0.047
Bis(2-chloroethoxy) methane	111-91-1	mg/kg	370	NS	NS	0.0135	0.00135	19	190	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Bis(2-chloroethyl) ether	111-44-4	mg/kg	4.9	NS	NS	0.00000361	0.00000361	0.23	0.23	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Bis(2-chloroisopropyl) ether	108-60-1	mg/kg	100	NS	NS	0.261	0.0261	310	3,100	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Bis(2-ethylhexyl) Phthalate	117-81-7	mg/kg	690	1.44	1.44	1.33	1.33	39	39	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Butyl Benzyl Phthalate	85-68-7	mg/kg	5,100	NS	NS	0.236	0.236	290	290	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Chloronaphthalene, Beta-	91-58-7	mg/kg	13,000	NS	NS	3.85	0.385	480	4,800	NS	NS		<0.13	<0.12	<0.1	<0.028	<0.027	<0.076	<0.047
Chrysene	218-01-9	mg/kg	1,200	NS	NS	1.24	1.24	16	16	NS	NS		<0.13	**0.3**	<0.1	<0.028	<0.027	<0.076	<0.047
Dibenz(a,h)anthracene	53-70-3	mg/kg	1.2	NS	NS	0.0131	0.0131	0.016	0.016	NS	NS		<0.13	<0.12	<0.1	<0.028	<0.027	<0.076	<0.047
Diethyl Phthalate	84-66-2	mg/kg	98,000	NS	NS	6.08	0.608	5,100	51,000	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Dimethyl phthalate	108-87-2	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Di-n-butyl Phthalate	84-74-2	mg/kg	12,000	NS	NS	2.27	0.227	630	6,300	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Di-n-Octyl Phthalate	117-84-0	mg/kg	1,200	NS	NS	56.5	5.65	63	630	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Fluoranthene	206-44-0	mg/kg	4,600	NS	NS	89.1	8.91	240	2,400	NS	NS		<0.13	<0.12	<0.1	<0.028	<0.027	**0.049 j**	<0.047
Fluorene	86-73-7	mg/kg	4,600	NS	NS	5.45	0.545	240	2,400	NS	NS		<0.13	**0.13**	<0.1	<0.028	<0.027	<0.076	<0.047
Hexachlorobenzene	118-74-1	mg/kg	6.1	0.0126	0.0126	0.000123	0.000123	0.21	0.21	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Hexachlorobutadiene	87-68-3	mg/kg	120	NS	NS	0.000267	0.000267	1.2	1.2	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Hexachlorocyclopentadiene	77-47-4	mg/kg	730	0.155	0.155	0.00128	0.000128	0.18	1.8	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Hexachloroethane	67-72-1	mg/kg	86	NS	NS	0.0002	0.0002	1.8	1.8	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	12	NS	NS	0.134	0.134	0.16	0.16	NS	NS		<0.13	**0.22**	<0.1	<0.028	<0.027	<0.076	<0.047
Isophorone	78-59-1	mg/kg	10,000	NS	NS	0.0258	0.0258	570	570	NS	NS		<3.2	<2.9	<2.6	<0.7	<0.68	<1.9	<1.2
Naphthalene	91-20-3	mg/kg	90	NS	NS	0.000543	0.000543	3.8	3.8	NS	0.36		<0.13	**0.12 j**	<0.1	<0.028	<0.027	<0.076	<0.047
Nitrobenzene	98-95-3	mg/kg	120	NS	NS	0.0000917	0.0000917	5.1	5.1	NS	NS		<3.2	<2.9	<2.6	<0.7	<0.68	<1.9	<1.2
n-Nitrosodimethylamine	62-75-9	mg/kg	0.19	NS	NS	0.00000003	0.00000003	0.002	0.002	NS	NS		<3.2	<2.9	<2.6	<0.7	<0.68	<1.9	<1.2
n-Nitroso-di-N-propylamine	621-64-7	mg/kg	1.4	NS	NS	0.0000081	0.0000081	0.078	0.078	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
n-Nitrosodiphenylamine	86-30-6	mg/kg	2,000	NS	NS	0.0666	0.0666	110	110	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Pentachlorophenol	87-86-5	mg/kg	18	0.0101	0.0101	0.000418	0.000418	1	1	NS	NS		<0.64	<0.58	<0.5	<0.14	<0.13	<0.38	<0.23
Phenanthrene	85-01-8	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.13	**1.3**	<0.1	<0.028	**0.019 j**	**0.045 j**	**0.059**
Phenol	108-95-2	mg/kg	37,000	NS	NS	3.31	0.331	1,900	19,000	NS	1.2		**2.7**	**2.4**	**1.2**	<0.14	<0.13	<0.38	<0.23
Pyrene	129-00-0	mg/kg	3,400	NS	NS	13.2	1.32	180	1,800	NS	NS		<0.13	**0.71**	<0.1	<0.028	<0.027	<0.076	<0.047

Notes

NS = No Standard

Exceeds one or more screening/standards

Bold indicates detection above the Method Detection Limit

ROCKY RIDGE QUARRY

TABLE 2

SUMMARY OF DWTM SAMPLE E-2 AND SOIL/E-2 DWTR BLEND RESULTS

Parameters	CASNumber	Units	2014 VAP Residential Generic Direct Contact	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater MCL based SSL THQ=1.0	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater MCL based SSL THQ=0.1	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater Risk based SSL THQ=1.0	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater Risk based SSL THQ=0.1	Nov 2015 Residential Soil RSLs THQ=0.1	Nov 2015 Residential Soil RSLs THQ=1.0	Ohio Background Metals (Lucas County, Ohio; Less than 50% Sand)	VAP Generic Leach-Based Soil Values Soil Class III for source ≥1/2 acre	Station Name	E2	Soil/DWTM 33/66-1	Soil/DWTM 33/66-2	Soil/DWTM 33/66-3	Soil/DWTM 50/50-1	Soil/DWTM 50/50-2	Soil/DWTM 50/50-3	Soil/DWTM 66/33-1	Soil/DWTM 66/33-2	Soil/DWTM 66/33-3
												Sample Date	4/26/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016
												FieldSampleID	RCK001: E2: D000160	RCK001: 33/66-1: S051616	RCK001: 33/66-2: S051616	RCK001: 33/66-3: S051616	RCK001: 50/50-1: S051616	RCK001: 50/50-2: S051616	RCK001: 50/50-3: S051616	RCK001: 66/33-1: S051616	RCK001: 66/33-2: S051616	RCK001: 66/33-3: S051616
A4500-Cl E-97																						
Chloride	16887-00-6	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**120**	**35**	**37**	**44**	**29**	**27**	**27**	**15**	**17**	**14**
A4500-NH3 G-97																						
Ammonia as Nitrogen	7664-41-7	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**100 j**	**9.8 j**	**13 j**	**9.5 j**	**24**	**9.1 j**	**8.8 j**	**7.7 j**	**12 j**	**5.7 j**
Nitrogen, Total Kjeldahl		mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**1300**	**790**	**740**	**800**	**700**	**670**	**720**	**610**	**590**	**560**
A4500-NO2 B																						
Nitrite	14797-65-0	mg/kg	NS	NS	NS	NS	NS	780	7,800	NS	NS		<3.8	<1.1	**0.057 j**	<1.1	**0.048 j**	**0.052 j**	**0.052 j**	**0.036 j**	**0.57 j**	**0.065 j**
A4500-P E-97																						
Phosphorus, Ortho-P	14265-44-2	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<7.3	**1.6**	**1.5 j**	**2**	**1.6**	**1.1 j**	**1.1 j**	**1.6**	**1.2**	**1.3**
A5210B-97																						
Biochemical Oxygen Demand		mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**140**	<16	<16	<16	<14	<15	<14	<12	<12	<12
Calculation																						
Nitrogen	7727-37-9	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**1300**	**800**	**750**	**790**	**700**	**670**	**720**	**610**	**600**	**560**
Nitrogen, Total Inorganic	7727-37-9	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**1300**	**11**	**13**	**10**	**26**	**9.7**	**9.3**	**8.6**	**12**	**6.9**
Nitrogen, Total Organic	7727-37-9	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**1200**	**790**	**740**	**780**	**670**	**660**	**710**	**600**	**580**	**560**
E353.2																						
Nitrate	14797-55-8	mg/kg	NS	NS	NS	NS	NS	13,000	130,000	NS	NS		**1.7 j**	**1.1 j**	**0.31 j**	**0.45 j**	**0.8 j**	**0.49 j**	**0.42 j**	**0.89 j**	**0.77 j**	**1.1 j**
Nitrate-Nitrite as Nitrogen	7727-37-9	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**2 j**	**1.2 j**	**0.4 j**	**0.51 j**	**0.78 j**	**0.56 j**	**0.5 j**	**0.92 j**	**1.3**	**1.1 j**
E365.1 R2.0																						
Phosphorus	7723-14-0	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**360**	**280**	**340**	**320**	**320**	**280**	**390**	**310**	**300**	**290**
E410.4 R2.0																						
Chemical Oxygen Demand		mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<3600	**370 j**	**410 j**	**400 j**	**450 j**	**300 j**	**300 j**	**260 j**	**250 j**	**230 j**
SW3550C																						
Percent Moisture		%	NS	NS	NS	NS	NS	NS	NS	NS	NS		**83**	**37**	**37**	**37**	**31**	**31**	**31**	**20**	**19**	**18**
SW6020A																						
Antimony	7440-36-0	mg/kg	63	0.271	0.271	0.352	0.0352	3.1	31	NS	3.6		<23	**0.2 j**	**0.36 j**	**0.39 j**	**0.37 j**	**0.29 j**	**0.29 j**	**0.31 j**	**0.33 j**	**0.37 j**
Arsenic	7440-38-2	mg/kg	12	0.292	0.292	0.00151	0.00151	0.68	0.68	9.7	3		**4.7 j**	**6.2**	**10**	**11**	**9.3**	**8**	**9.4**	**8.5**	**9.1**	**9.8**
Beryllium	7440-41-7	mg/kg	310	3.16	3.16	19.5	1.95	16	160	NS	57		<9.3	**0.44 j**	**0.5 j**	**0.54 j**	**0.55 j**	**0.53 j**	**0.6 j**	**0.54 j**	**0.52 j**	**0.61 j**
Cadmium	7440-43-9	mg/kg	140	0.376	0.376	0.693	0.0693	7.1	71	23.2	21		<9.3	**0.21 j**	**0.34 j**	**0.28 j**	**0.31 j**	**0.26 j**	**0.28 j**	**0.28 j**	**0.25 j**	**0.3 j**
Chromium	7440-47-3	mg/kg	NS	180,000	180,000	180,000	NS	NS	NS	12.1	56		**5.9 j**	**15**	**15**	**17**	**17**	**17**	**18**	**18**	**19**	**21**
Copper	7440-50-8	mg/kg	6,300	45.8	45.8	28.1	2.81	310	3,100	NS	NS		**9.4 j**	**17**	**22**	**23**	**22**	**21**	**22**	**22**	**24**	**26**
Lead	7439-92-1	mg/kg	400	13.5	13.5	13.5	NS	400	400	17	89		**4.1 j**	**9.2**	**10**	**12**	**12**	**10**	**11**	**11**	**11**	**12**
Magnesium	7439-95-4	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**30000**	**19000**	**23000**	**20000**	**16000**	**16000**	**17000**	**15000**	**15000**	**15000**
Nickel	7440-02-0	mg/kg	3,100	NS	NS	25.6	2.56	150	1,500	28.5	182		**11 j**	**24**	**27**	**28**	**31**	**27**	**28**	**28**	**32**	**36**
Potassium	7440-09-7	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**940 j**	**1400**	**1700**	**1700**	**1700**	**1800**	**1800**	**1700**	**1800**	**1700**
Selenium	7782-49-2	mg/kg	780	0.26	0.26	0.519	0.0519	39	390	NS	2.15		<23	**1.7 j**	**1.9 j**	**2.9 j**	**1.6 j**	**1.5 j**	**2.2 j**	**1.7 j**	**2 j**	**2.1 j**
Silver	7440-22-4	mg/kg	780	NS	NS	0.799	0.0799	39	390	NS	3120		<23	<5.5	<6.5	<6.1	<4.9	<5.8	<5.1	<4.9	<4.9	<4
Sodium	7440-23-5	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**300 j**	**180 j**	**190 j**	**180 j**	**170 j**	**150 j**	**170 j**	**140 j**	**130 j**	**130 j**
Thallium	7440-28-0	mg/kg	NS	0.142	0.142	0.0142	0.00142	0.078	0.78	0.44	1.5		<23	**0.26 j**	**0.39 j**	**0.37 j**	**0.36 j**	**0.33 j**	**0.32 j**	**0.39 j**	**0.34 j**	**0.44 j**
Zinc	7440-66-6	mg/kg	47,000	NS	NS	373	37.3	2,300	23,000	NS	44,000		**27 j**	**58**	**63**	**65**	**69**	**63**	**64**	**69**	**69**	**75**
SW7471A																						
Mercury	7439-97-6	mg/kg	3.1	0.104	0.104	0.0327	0.00327	1.1	11	0.045	12		**0.024 j**	**0.028**	**0.024**	**0.027**	**0.026**	**0.025**	**0.025**	**0.025**	**0.026**	**0.028**
SW8081A																						
Aldrin	309-00-2	mg/kg	0.57	NS	NS	0.000151	0.000151	0.039	0.039	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
alpha-Chlordane	5103-71-9	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
Chlordane	57-74-9	mg/kg	32	0.136	0.136	0.00304	0.00304	1.7	1.7	NS	NS		<0.36	<0.077	<0.079	<0.078	<0.071	<0.069	<0.071	<0.061	<0.059	<0.058
DDD	72-54-8	mg/kg	40	NS	NS	0.00746	0.00746	2.3	2.3	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
DDE	72-55-9	mg/kg	29	NS	NS	0.0109	0.0109	2	2	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
DDT	50-29-3	mg/kg	34	NS	NS	0.0773	0.0773	1.9	1.9	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
delta-BHC	319-86-8	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
Dieldrin	60-57-1	mg/kg	0.61	NS	NS	0.0000708	0.0000708	0.034	0.034	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
Endosulfan I	959-98-8	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
Endosulfan II	33213-65-9	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
Endosulfan Sulfate	1031-07-8	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
Endrin	72-20-8	mg/kg	37	0.0808	0.0808	0.0922	0.00922	1.9	19	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
Endrin aldehyde	7421-93-4	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
Heptachlor	76-44-8	mg/kg	2.2	0.0331	0.0331	0.000115	0.000115	0.13	0.13	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
Heptachlor Epoxide	1024-57-3	mg/kg	1.1	0.00408	0.00408	0.0000284	0.0000284	0.07	0.07	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
Hexachlorocyclohexane, Alpha-	319-84-6	mg/kg	1.5	NS	NS	0.0000421	0.0000421	0.086	0.086	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
Hexachlorocyclohexane, Beta-	319-85-7	mg/kg	5.4	NS	NS	0.000147	0.000147	0.3	0.3	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	mg/kg	10	0.00116	0.00116	0.000241	0.000241	0.57	0.57	NS	NS		<0.15	<0.031	<0.032	<0.031	<0.028	<0.028	<0.028	<0.024	<0.024	<0.023
Toxaphene	8001-35-2	mg/kg	8.8	0.464	0.464	0.0109	0.0109	0.49	0.49	NS	NS		<0.87	<0.18	<0.19	<0.19	<0.17	<0.17	<0.17	<0.15	<0.14	<0.14

Notes

NS = No Standard

Exceeds one or more screening/standards

ROCKY RIDGE QUARRY

TABLE 2

SUMMARY OF DWTM SAMPLE E-2 AND SOIL/E-2 DWTR BLEND RESULTS

Parameters	CASNumber	Units	2014 VAP Residential Generic Direct Contact	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater MCL based SSL THQ=1.0	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater MCL based SSL THQ=0.1	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater Risk based SSL THQ=1.0	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater Risk based SSL THQ=0.1	Nov 2015 Residential Soil RSLs THQ=0.1	Nov 2015 Residential Soil RSLs THQ=1.0	Ohio Background Metals (Lucas County, Ohio; Less than 50% Sand)	VAP Generic Leach-Based Soil Values Soil Class III for source ≥1/2 acre	Station Name	E2	Soil/DWTM 33/66-1	Soil/DWTM 33/66-2	Soil/DWTM 33/66-3	Soil/DWTM 50/50-1	Soil/DWTM 50/50-2	Soil/DWTM 50/50-3	Soil/DWTM 66/33-1	Soil/DWTM 66/33-2	Soil/DWTM 66/33-3
												Sample Date	4/26/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016
												FieldSampleID	RCK001: E2: D000160	RCK001: 33/66-1: S051616	RCK001: 33/66-2: S051616	RCK001: 33/66-3: S051616	RCK001: 50/50-1: S051616	RCK001: 50/50-2: S051616	RCK001: 50/50-3: S051616	RCK001: 66/33-1: S051616	RCK001: 66/33-2: S051616	RCK001: 66/33-3: S051616
SW8082																						
Aroclor 1016	12674-11-2	mg/kg	7.9	NS	NS	0.0214	0.0134	0.41	4.1	NS	NS		<0.61	<0.13	<0.13	<0.13	<0.12	<0.12	<0.12	<0.1	<0.099	<0.097
Aroclor 1221	11104-28-2	mg/kg	3.1	NS	NS	0.00008	0.00008	0.2	0.2	NS	NS		<0.61	<0.13	<0.13	<0.13	<0.12	<0.12	<0.12	<0.1	<0.099	<0.097
Aroclor 1232	11141-16-5	mg/kg	3.1	NS	NS	0.00008	0.00008	0.17	0.17	NS	NS		<0.61	<0.13	<0.13	<0.13	<0.12	<0.12	<0.12	<0.1	<0.099	<0.097
Aroclor 1242	53469-21-9	mg/kg	4.4	NS	NS	0.00123	0.00123	0.23	0.23	NS	NS		<0.61	<0.13	<0.13	<0.13	<0.12	<0.12	<0.12	<0.1	<0.099	<0.097
Aroclor 1248	12672-29-6	mg/kg	4.4	NS	NS	0.0012	0.0012	0.23	0.23	NS	NS		<0.61	<0.13	<0.13	<0.13	<0.12	<0.12	<0.12	<0.1	<0.099	<0.097
Aroclor 1254	11097-69-1	mg/kg	2.2	NS	NS	0.00205	0.00205	0.12	0.24	NS	NS		<0.61	<0.13	<0.13	<0.13	<0.12	<0.12	<0.12	<0.1	<0.099	<0.097
Aroclor 1260	11096-82-5	mg/kg	4.4	NS	NS	0.00549	0.00549	0.24	0.24	NS	NS		<0.61	<0.13	<0.13	<0.13	<0.12	<0.12	<0.12	<0.1	<0.099	<0.097
SW8260B																						
1,1,1-Trichloroethane	71-55-6	mg/kg	640	0.0701	0.0701	2.81	0.281	810	8,100	NS	1.3		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
1,1,2,2-Tetrachloroethane	79-34-5	mg/kg	14	NS	NS	0.0000296	0.0000296	0.6	0.6	NS	NS		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
1,1,2-Trichloroethane	79-00-5	mg/kg	26	0.00162	0.00162	0.0000893	0.0000135	0.15	1.1	NS	NS		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
1,1-Dichloroethane	75-34-3	mg/kg	83	NS	NS	0.000782	0.000782	3.6	3.6	NS	NS		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
1,1-Dichloroethene	75-35-4	mg/kg	360	0.00251	0.00251	0.102	0.0102	23	230	NS	0.24		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
1,2-Dichlorobenzene	95-50-1	mg/kg	380	0.584	0.584	0.295	0.0295	180	1,800	NS	NS		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
1,2-Dichloroethane	107-06-2	mg/kg	11	0.00142	0.00142	0.0000484	0.0000484	0.46	0.46	NS	0.003		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
1,2-Dichloropropane	78-87-5	mg/kg	23	0.00166	0.00166	0.000145	0.000145	1	1	NS	NS		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
1,3-Dichlorobenzene	541-73-1	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
1,4-Dichlorobenzene	106-46-7	mg/kg	61	0.072	0.072	0.000462	0.000462	2.6	2.6	NS	NS		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
Acrolein	107-02-8	mg/kg	0.39	NS	NS	0.00000841	0.000000841	0.014	0.14	NS	NS		<2.3	<0.43	<0.43	<0.43	<0.38	<0.38	<0.38	<0.3	<0.29	<0.29
Acrylonitrile	107-13-1	mg/kg	5.7	NS	NS	0.0000114	0.0000114	0.25	0.25	NS	NS		<1.2	<0.22	<0.22	<0.22	<0.19	<0.19	<0.19	<0.15	<0.15	<0.14
Benzene	71-43-2	mg/kg	26	0.00256	0.00256	0.000233	0.000233	1.2	1.2	NS	0.015		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
Bromodichloromethane	75-27-4	mg/kg	6.8	0.0217	0.0217	0.0000365	0.0000365	0.29	0.29	NS	NS		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
Bromoform	75-25-2	mg/kg	1200	0.0212	0.0212	0.000873	0.000873	19	19	NS	NS		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
Bromomethane	74-83-9	mg/kg	18	NS	NS	0.00206	0.000191	0.68	24	NS	NS		<0.88	<0.16	<0.16	<0.16	<0.14	<0.14	<0.14	<0.11	<0.11	<0.11
Carbon Tetrachloride	56-23-5	mg/kg	15	0.00194	0.00194	0.000177	0.000177	0.65	0.65	NS	0.28		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
Chlorobenzene	108-90-7	mg/kg	700	0.0679	0.0679	0.0528	0.00528	28	280	NS	NS		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
Chloroethane	75-00-3	mg/kg	2100	NS	NS	5.92	0.592	1,400	14,000	NS	NS		<1.2	<0.22	<0.22	<0.22	<0.19	<0.19	<0.19	<0.15	<0.15	<0.14
Chloroform	67-66-3	mg/kg	7.4	0.0222	0.0222	0.0000612	0.0000612	0.32	0.32	NS	NS		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
Chloromethane	74-87-3	mg/kg	300	NS	NS	0.0486	0.00486	11	110	NS	NS		<1.2	<0.22	<0.22	<0.22	<0.19	<0.19	<0.19	<0.15	<0.15	<0.14
cis-1,2-Dichloroethene	156-59-2	mg/kg	NS	0.0206	0.0206	0.0106	0.00106	16	160	NS	0.12		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
cis-1,3-Dichloropropene	10061-01-5	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
Dibromochloromethane	124-48-1	mg/kg	17	0.0213	0.0213	0.000232	0.000232	8.3	8.3	NS	NS		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
Ethylbenzene	100-41-4	mg/kg	130	0.785	0.785	0.00168	0.00168	5.8	5.8	NS	16		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
Methylene Chloride	75-09-2	mg/kg	750	0.00128	0.00128	0.00291	0.00272	35	57	NS	NS		**0.52**	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
Tetrachloroethene	127-18-4	mg/kg	170	0.00227	0.00227	0.00513	0.00184	8.1	24	NS	0.27		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
Toluene	108-88-3	mg/kg	820	0.692	0.692	0.762	0.0762	490	4,900	NS	7.7		<0.35	<0.065	**0.025 j**	**0.024 j**	**0.023 j**	**0.024 j**	**0.023 j**	**0.022 j**	**0.025 j**	**0.024 j**
trans-1,2-Dichloroethene	156-60-5	mg/kg	370	0.0313	0.0313	0.113	0.0113	160	1,600	NS	0.4		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
trans-1,3-Dichloropropene	10061-02-6	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
Trichloroethene	79-01-6	mg/kg	11	0.00179	0.00179	0.000176	0.000101	0.41	0.94	NS	0.048		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043
Vinyl Chloride	75-01-4	mg/kg	1.3	0.00069	0.00069	0.00000647	0.00000647	0.059	0.059	NS	0.012		<0.35	<0.065	<0.065	<0.065	<0.057	<0.057	<0.057	<0.045	<0.044	<0.043

Notes

NS = No Standard

Exceeds one or more screening/standards

ROCKY RIDGE QUARRY

TABLE 2

SUMMARY OF DWTM SAMPLE E-2 AND SOIL/E-2 DWTR BLEND RESULTS

Parameters	CASNumber	Units	2014 VAP Residential Generic Direct Contact	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater MCL based SSL THQ=1.0	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater MCL based SSL THQ=0.1	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater Risk based SSL THQ=1.0	Region 9 November 2015 RSLs Protection of Groundwater Resident Soil to Groundwater Risk based SSL THQ=0.1	Nov 2015 Residential Soil RSLs THQ=0.1	Nov 2015 Residential Soil RSLs THQ=1.0	Ohio Background Metals (Lucas County, Ohio; Less than 50% Sand)	VAP Generic Leach-Based Soil Values Soil Class III for source ≥1/2 acre	Station Name	E2	Soil/DWTM 33/66-1	Soil/DWTM 33/66-2	Soil/DWTM 33/66-3	Soil/DWTM 50/50-1	Soil/DWTM 50/50-2	Soil/DWTM 50/50-3	Soil/DWTM 66/33-1	Soil/DWTM 66/33-2	Soil/DWTM 66/33-3
												Sample Date	4/26/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016	5/16/2016
												FieldSampleID	RCK001: E2: D000160	RCK001: 33/66-1: S051616	RCK001: 33/66-2: S051616	RCK001: 33/66-3: S051616	RCK001: 50/50-1: S051616	RCK001: 50/50-2: S051616	RCK001: 50/50-3: S051616	RCK001: 66/33-1: S051616	RCK001: 66/33-2: S051616	RCK001: 66/33-3: S051616
SW8270C																						
1,2-Diphenylhydrazine	122-66-7	mg/kg	12	NS	NS	0.00025	0.00025	0.68	0.68	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
2,4,6-Trichlorophenol	88-06-2	mg/kg	120	NS	NS	0.0154	0.00452	6.3	49	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
2,4-Dichlorophenol	120-83-2	mg/kg	370	NS	NS	0.0541	0.00541	19	190	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
2,4-Dimethylphenol	105-67-9	mg/kg	2,400	NS	NS	0.421	0.0421	130	1,300	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
2,4-Dinitrophenol	51-28-5	mg/kg	240	NS	NS	0.0436	0.00436	13	130	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
2,4-Dinitrotoluene	121-14-2	mg/kg	31	NS	NS	0.000321	0.000321	1.7	1.7	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
2,6-Dinitrotoluene	606-20-2	mg/kg	6.5	NS	NS	0.0000667	0.0000667	0.36	0.36	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
2-Chlorophenol	95-57-8	mg/kg	780	NS	NS	0.0742	0.00742	39	390	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
2-Nitrophenol	88-75-5	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
3,3-Dichlorobenzidine	91-94-1	mg/kg	22	NS	NS	0.000824	0.000824	1.2	1.2	NS	NS		<2.9	<0.52	<0.34	<0.4	<0.24	<0.36	<0.35	<0.2	<0.2	<0.2
4,6-Dinitro-o-cresol	534-52-1	mg/kg	NS	NS	NS	0.00258	0.000258	0.51	5.1	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	**0.047**
4-Bromophenyl-phenylether	101-55-3	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
4-Chloro-3-methylphenol	59-50-7	mg/kg	12,000	NS	NS	1.71	0.171	630	6,300	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
4-Chlorophenyl-phenylether	7005-72-3	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
4-Nitrophenol	100-02-7	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
Acenaphthene	83-32-9	mg/kg	6,900	NS	NS	5.49	0.549	360	3600	NS	NS		**0.11 j**	<0.021	<0.013	<0.016	<0.0096	<0.014	<0.014	<0.0082	<0.0081	<0.0081
Acenaphthylene	208-96-8	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.12	<0.021	<0.013	**0.0063 j**	<0.0096	<0.014	<0.014	<0.0082	<0.0081	<0.0081
Anthracene	120-12-7	mg/kg	34,000	NS	NS	58.1	5.81	1,800	18,000	NS	NS		**0.22**	<0.021	<0.013	**0.013 j**	**0.0086 j**	<0.014	<0.014	<0.0082	<0.0081	<0.0081
Benzidine	92-87-5	mg/kg	0.042	NS	NS	0.00000028	0.00000028	0.00053	0.00053	NS	NS		<12	<0.52	<0.34	<0.4	<0.24	<0.36	<0.35	<0.2	<0.2	<0.2
Benzo(a)anthracene	56-55-3	mg/kg	12	NS	NS	0.00425	0.00425	0.16	0.16	NS	NS		**0.29**	<0.021	<0.013	**0.058**	**0.036**	<0.014	**0.033**	<0.0082	<0.0081	<0.0081
Benzo(a)pyrene	50-32-8	mg/kg	1.2	0.235	0.235	0.00403	0.00403	0.016	0.016	NS	NS		**0.33**	<0.021	<0.013	**0.033**	**0.017**	<0.014	**0.015**	<0.0082	<0.0081	<0.0081
Benzo(b)fluoranthene	205-99-2	mg/kg	12	NS	NS	0.0411	0.0411	0.16	0.16	NS	NS		**0.4**	<0.021	<0.013	**0.043**	**0.034**	<0.014	**0.031**	<0.0082	<0.0081	<0.0081
Benzo(g,h,i)perylene	191-24-2	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**0.19**	<0.021	<0.013	**0.031**	**0.019**	<0.014	**0.023**	<0.0082	<0.0081	<0.0081
Benzo(k)fluoranthene	207-08-9	mg/kg	120	NS	NS	0.403	0.403	1.6	1.6	NS	NS		**0.16**	<0.021	<0.013	**0.017**	**0.012**	<0.014	**0.013 j**	<0.0082	<0.0081	<0.0081
Bis(2-chloroethoxy) methane	111-91-1	mg/kg	370	NS	NS	0.0135	0.00135	19	190	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
Bis(2-chloroethyl) ether	111-44-4	mg/kg	4.9	NS	NS	0.00000361	0.00000361	0.23	0.23	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
Bis(2-chloroisopropyl) ether	108-60-1	mg/kg	100	NS	NS	0.261	0.0261	310	3,100	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
Bis(2-ethylhexyl) Phthalate	117-81-7	mg/kg	690	1.44	1.44	1.33	1.33	39	39	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
Butyl Benzyl Phthalate	85-68-7	mg/kg	5,100	NS	NS	0.236	0.236	290	290	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
Chloronaphthalene, Beta-	91-58-7	mg/kg	13,000	NS	NS	3.85	0.385	480	4,800	NS	NS		<0.12	<0.021	<0.013	<0.016	<0.0096	<0.014	<0.014	<0.0082	<0.0081	<0.0081
Chrysene	218-01-9	mg/kg	1,200	NS	NS	1.24	1.24	16	16	NS	NS		**0.3**	<0.021	<0.013	**0.04**	**0.032**	<0.014	**0.026**	<0.0082	<0.0081	<0.0081
Dibenz(a,h)anthracene	53-70-3	mg/kg	1.2	NS	NS	0.0131	0.0131	0.016	0.016	NS	NS		<0.12	<0.021	<0.013	<0.016	<0.0096	<0.014	<0.014	<0.0082	<0.0081	<0.0081
Diethyl Phthalate	84-66-2	mg/kg	98,000	NS	NS	6.08	0.608	5,100	51,000	NS	NS		<0.58	**0.056 j**	**0.046 j**	**0.045 j**	<0.047	<0.072	**0.033 j**	<0.041	<0.04	**0.032 j**
Dimethyl phthalate	108-87-2	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		<0.58	<0.1	**0.031 j**	**0.028 j**	**0.026 j**	**0.027 j**	**0.026 j**	<0.041	**0.023 j**	**0.024 j**
Di-n-butyl Phthalate	84-74-2	mg/kg	12,000	NS	NS	2.27	0.227	630	6,300	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	**0.013 j**	**0.017 j**	<0.04
Di-n-Octyl Phthalate	117-84-0	mg/kg	1,200	NS	NS	56.5	5.65	63	630	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
Fluoranthene	206-44-0	mg/kg	4,600	NS	NS	89.1	8.91	240	2,400	NS	NS		<0.12	**0.017 j**	**0.013**	**0.063**	**0.071**	**0.018**	**0.042**	**0.0086**	**0.014**	**0.021**
Fluorene	86-73-7	mg/kg	4,600	NS	NS	5.45	0.545	240	2,400	NS	NS		**0.13**	<0.021	**0.011 j**	**0.013 j**	<0.0096	<0.014	**0.018**	**0.017**	**0.015**	**0.019**
Hexachlorobenzene	118-74-1	mg/kg	6.1	0.0126	0.0126	0.000123	0.000123	0.21	0.21	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
Hexachlorobutadiene	87-68-3	mg/kg	120	NS	NS	0.000267	0.000267	1.2	1.2	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
Hexachlorocyclopentadiene	77-47-4	mg/kg	730	0.155	0.155	0.00128	0.000128	0.18	1.8	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
Hexachloroethane	67-72-1	mg/kg	86	NS	NS	0.0002	0.0002	1.8	1.8	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
Indeno(1,2,3-c,d)pyrene	193-39-5	mg/kg	12	NS	NS	0.134	0.134	0.16	0.16	NS	NS		**0.22**	<0.021	<0.013	**0.028**	**0.021**	<0.014	**0.021**	<0.0082	<0.0081	<0.0081
Isophorone	78-59-1	mg/kg	10,000	NS	NS	0.0258	0.0258	570	570	NS	NS		<2.9	<0.52	**0.13 j**	<0.4	<0.24	<0.36	<0.35	<0.2	<0.2	<0.2
Naphthalene	91-20-3	mg/kg	90	NS	NS	0.000543	0.000543	3.8	3.8	NS	0.36		**0.12 j**	**0.043**	**0.032**	**0.033**	**0.035**	<0.014	**0.038**	**0.034**	**0.04**	**0.044**
Nitrobenzene	98-95-3	mg/kg	120	NS	NS	0.0000917	0.0000917	5.1	5.1	NS	NS		<2.9	<0.52	<0.34	<0.4	<0.24	<0.36	<0.35	<0.2	<0.2	<0.2
n-Nitrosodimethylamine	62-75-9	mg/kg	0.19	NS	NS	0.00000003	0.00000003	0.002	0.002	NS	NS		<2.9	<0.52	<0.34	<0.4	<0.24	<0.36	<0.35	<0.2	<0.2	<0.2
n-Nitroso-di-N-propylamine	621-64-7	mg/kg	1.4	NS	NS	0.0000081	0.0000081	0.078	0.078	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
n-Nitrosodiphenylamine	86-30-6	mg/kg	2,000	NS	NS	0.0666	0.0666	110	110	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
Pentachlorophenol	87-86-5	mg/kg	18	0.0101	0.0101	0.000418	0.000418	1	1	NS	NS		<0.58	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
Phenanthrene	85-01-8	mg/kg	NS	NS	NS	NS	NS	NS	NS	NS	NS		**1.3**	**0.036**	**0.031**	**0.043**	**0.056**	**0.044**	**0.054**	**0.047**	**0.049**	**0.059**
Phenol	108-95-2	mg/kg	37,000	NS	NS	3.31	0.331	1,900	19,000	NS	1.2		**2.4**	<0.1	<0.066	<0.078	<0.047	<0.072	<0.069	<0.041	<0.04	<0.04
Pyrene	129-00-0	mg/kg	3,400	NS	NS	13.2	1.32	180	1,800	NS	NS		**0.71**	**0.022**	**0.011 j**	**0.071**	**0.058**	**0.018**	**0.044**	**0.014**	**0.017**	**0.029**
SW9012B																						
Total Cyanide	57-12-5	mg/kg	NS	2.02	2.02	0.0148	0.00148	0.27	2.7	NS	NS		<2.4	**0.11 j**	**0.13 j**	**0.092 j**	**0.063 j**	**0.057 j**	**0.071 j**	**0.04 j**	**0.042 j**	**0.044 j**
SW9045D																						
pH	NS	s.u.	NS	NS	NS	NS	NS	NS	NS	NS	NS		**9.3**	**9.6**	**8.8**	**8.8**	**8.6**	**8.5**	**8.7**	**8.2**	**8.5**	**8.4**
TITRAMETRIC																						
Organic Carbon - W-B	7727-37-9	%	NS	NS	NS	NS	NS	NS	NS	NS	NS		**3.5**	**1.1**	**1.1**	**1.1**	**0.91**	**0.98**	**0.97**	**0.77**	**0.73**	**0.7**

Notes

NS = No Standard

Specific RSL that had an exceedance

Exceeds one or more screening/standards

ROCKY RIDGE QUARRY

TABLE 3

SUMMARY OF SOIL/E-2 DWTM BLEND SPLP RESULTS

Parameters	CAS number	Units	2014 VAP Generic Unrestricted Potable Use Standard	Drinking Water Regulations Primary and Secondary Standards	May 2016 Residential Soil to GW RSL THQ=0.1	May 2016 Residential Soil to GW RSL. THQ=1.0	Elmore Water Works Ambient Groundwater Data (2013)	Station Name	33/66 Soil/DWTM	50/50 Soil/DWTM	66/33 Soil/DWTM
								Sample Date	5/16/2016	5/16/2016	5/16/2016
								FieldSampleID	RCK001:33/66:S05161 6	RCK001:50/50:S05161 6	RCK001:66/33:S05161 6
A4500-Cl E-97											
Chloride	16887-00-6	ug/l	NS	250,000	NS	NS	14880		**1300**	**890 j**	**1600**
A4500-NH3 G-97											
Ammonia as Nitrogen	7664-41-7	ug/l	NS	NS	NS	NS	150		<20	<20	<20
Nitrogen, Total Kjeldahl		mg/l	NS	NS	NS	NS	0.3		<1	<1	<1
A4500-NO2 B											
Nitrite	14797-65-0	ug/l	NS	1,000	NS	NS	200		**3.3 j**	<20	<20
A4500-P E-99											
Phosphorus, Ortho-P	7723-14-0	ug/l	NS	NS	NS	NS	--		**41 j**	**42 j**	**83**
A5210B-01											
Biochemical Oxygen Demand		mg/l	NS	NS	NS	NS	--		<2	<2	<2
A5310C-00											
Total Organic Carbon	7440-44-0	ug/l	NS	NS	NS	NS	3370		**2200**	**1900**	**1700**
Calculation											
Nitrogen	7727-37-9	mg/l	NS	NS	NS	NS	--		<1	<1	<1
Nitrogen, Total Inorganic	7727-37-9	mg/l	NS	NS	NS	NS	--		**0.025**	**0.025**	**0.061**
Nitrogen, Total Organic	7727-37-9	mg/l	NS	NS	NS	NS	--		<1	<1	<1
E353.2 R2.0											
Nitrate	14797-55-8	ug/l	NS	10,000	NS	NS	140		**22**	**25**	**61**
Nitrate-Nitrite as Nitrogen	7727-37-9	ug/l	NS	10,000	NS	NS	170		**26**	**18 j**	**62**
E365.1 R2.0											
Phosphorus	7723-14-0	ug/l	NS	NS	NS	NS	140		**44 j**	--	--
E410.4 R2.0											
Chemical Oxygen Demand		mg/l	NS	NS	NS	NS	14		<5	<5	<5
SW6020A											
Antimony	7440-36-0	ug/l	6	6	NS	NS	--		**0.39 j**	**0.36 j**	**0.38 j**
Arsenic	7440-38-2	ug/l	10	10	0.052	0.052	2		**1.9 j**	**2.2 j**	**1.3 j**
Beryllium	7440-41-7	ug/l	4	4	NS	NS	--		<2	<2	<2
Cadmium	7440-43-9	ug/l	5	5	NS	NS	0.91		**0.071 j**	**0.095 j**	**0.098 j**
Chromium	7440-47-3	ug/l	100	100	NS	NS	40		**0.93 j**	**1.7 j**	**0.78 j**
Copper	7440-50-8	ug/l	1,300	1,300/1,000 °	NS	NS	27		**4.9 j**	**1.1 j**	**1.1 j**
Lead	7439-92-1	ug/l	15	15	NS	NS	2		<5	<5	<5
Magnesium	7439-95-4	ug/l	NS	NS	NS	NS	--		**9800**	**7800**	**6400**
Nickel	7440-02-0	ug/l	300	NS	NS	NS	6.33		**0.63 j**	**1.2 j**	**0.59 j**
Potassium	7440-09-7	ug/l	NS	NS	NS	NS	2110		**890**	**850**	**950**
Selenium	7782-49-2	ug/l	50	50	NS	NS	2		<5	<5	**1.5 j**
Silver	7440-22-4	ug/l	71	100 °	NS	NS	--		<5	<5	<5
Sodium	7440-23-5	ug/l	NS	NS	NS	NS	11740		**12000**	**23000**	**2700**
Thallium	7440-28-0	ug/l	2	2	NS	NS	--		<2	<2	<2
Zinc	7440-66-6	ug/l	4,700	5,000 °	NS	NS	104		**4.2 j**	**5.1 j**	<10
SW7470A											
Mercury	7439-97-6	ug/l	2	2	NS	NS	--		<0.2	<0.2	<0.2
SW8081A											
Aldrin	309-00-2	ug/l	0.04	NS	0.00092	0.00092	*0.5*		<0.013	<0.011	<0.01
Chlordane	57-74-9	ug/l	2	NS	0.02	0.02	*0.5*		<0.65	<0.56	<0.5
DDD	72-54-8	ug/l	0.27	NS	0.032	0.032	*0.50*		<0.026	<0.022	<0.02
DDE	72-55-9	ug/l	2	NS	0.046	0.046	*0.50*		<0.026	<0.022	<0.02
DDT	50-29-3	ug/l	2	NS	0.23	0.23	*0.50*		<0.026	<0.022	<0.02
delta-BHC	319-86-8	ug/l	NS	NS	NS	NS	--		<0.013	<0.011	<0.01
Dieldrin	60-57-1	ug/l	0.015	NS	0.0018	0.0018	*0.50*		<0.026	<0.022	<0.02
Endosulfan I	959-98-8	ug/l	NS	NS	NS	NS	--		<0.026	<0.022	<0.02
Endosulfan II	33213-65-9	ug/l	NS	NS	NS	NS	--		<0.026	<0.022	<0.02
Endosulfan Sulfate	1031-07-8	ug/l	NS	NS	NS	NS	--		<0.026	<0.022	<0.02
Endrin	72-20-8	ug/l	2	2	NS	NS	*0.50*		<0.026	<0.022	<0.02
Endrin aldehyde	7421-93-4	ug/l	NS	NS	NS	NS	--		<0.026	<0.022	<0.02
Heptachlor	76-44-8	ug/l	0.4	0.4	0.0014	0.0014	*0.50*		<0.013	<0.011	<0.01
Heptachlor Epoxide	1024-57-3	ug/l	0.2	0.2	0.0014	0.0014	*0.50*		<0.013	<0.011	<0.01
Hexachlorocyclohexane, Alpha-	319-84-6	ug/l	0.062	NS	0.0072	0.0072	--		<0.013	<0.011	<0.01
Hexachlorocyclohexane, Beta-	319-85-7	ug/l	0.22	NS	0.025	0.025	--		<0.013	<0.011	<0.01
Hexachlorocyclohexane, Gamma- (Lindane)	58-89-9	ug/l	0.2	0.2	0.042	0.042	--		<0.013	<0.011	<0.01
Toxaphene	8001-35-2	ug/l	3	3	0.071	0.071	*0.50*		<2.6	<2.2	<2

Notes

NS = No Standard

-- = Not measured

Exceeds one or more standards/comparisons

Detected above Method Detection Limit

Method Detection Limit

ROCKY RIDGE QUARRY

TABLE 3

SUMMARY OF SOIL/E-2 DWTM BLEND SPLP RESULTS

Parameters	CAS number	Units	2014 VAP Generic Unrestricted Potable Use Standard	Drinking Water Regulations Primary and Secondary Standards	May 2016 Residential Soil to GW RSL THQ=0.1	May 2016 Residential Soil to GW RSL. THQ=1.0	Elmore Water Works Ambient Groundwater Data (2013)	Station Name	33/66 Soil/DWTM	50/50 Soil/DWTM	66/33 Soil/DWTM
								Sample Date	5/16/2016	5/16/2016	5/16/2016
								FieldSampleID	RCK001:33/66:S05161 6	RCK001:50/50:S05161 6	RCK001:66/33:S05161 6
SW8082											
Aroclor 1016	12674-11-2	ug/l	1.1	0.5	0.22	0.22	--		<0.26	<0.22	<0.2
Aroclor 1221	11104-28-2	ug/l	0.041	0.5	0.0047	0.0047	--		<0.26	<0.22	<0.2
Aroclor 1232	11141-16-5	ug/l	0.041	0.5	0.0047	0.0047	--		<0.26	<0.22	<0.2
Aroclor 1242	53469-21-9	ug/l	0.34	0.5	0.0078	0.0078	--		<0.26	<0.22	<0.2
Aroclor 1248	12672-29-6	ug/l	0.34	0.5	0.0078	0.0078	--		<0.26	<0.22	<0.2
Aroclor 1254	11097-69-1	ug/l	0.31	0.5	0.0078	0.0078	--		<0.26	<0.22	<0.2
Aroclor 1260	11096-82-5	ug/l	0.34	0.5	0.0078	0.0078	--		<0.26	<0.22	<0.2
SW8260B											
1,1,1-Trichloroethane	71-55-6	ug/l	200	200	NS	NS	0.67		<1	<1	<1
1,1,2,2-Tetrachloroethane	79-34-5	ug/l	0.66	NS	0.076	0.076	*0.55*		<1	<1	<1
1,1,2-Trichloroethane	79-00-5	ug/l	*5*	*5*	0.28	0.28	*0.55*		<1	<1	<1
1,1-Dichloroethane	75-34-3	ug/l	24	NS	2.8	2.8	1.06		<1	<1	<1
1,1-Dichloroethene	75-35-4	ug/l	7	7	NS	NS	--		<1	<1	<1
1,2-Dichlorobenzene	95-50-1	ug/l	600	600	NS	NS	*0.55*		<1	<1	<1
1,2-Dichloroethane	107-06-2	ug/l	*5*	*5*	0.17	0.17	1.50		<1	<1	<1
1,2-Dichloropropane	78-87-5	ug/l	5	*5*	0.44	0.44	*0.55*		<1	<1	<1
1,3-Dichlorobenzene	541-73-1	ug/l	NS	NS	NS	NS	*0.55*		<1	<1	<1
1,4-Dichlorobenzene	106-46-7	ug/l	75	75	0.48	0.48	0.75		<1	<1	<1
Acrolein	107-02-8	ug/l	0.041	NS	NS	NS	--		<10	<10	<10
Acrylonitrile	107-13-1	ug/l	0.45	NS	0.052	0.052	--		<1	<1	<1
Benzene	71-43-2	ug/l	*5*	*5*	0.46	0.46	1.32		<1	<1	<1
Bromodichloromethane	75-27-4	ug/l	80	80	0.13	0.13	--		<1	<1	<1
Bromoform	75-25-2	ug/l	80	80	3.3	3.3	0.92		<1	<1	<1
Bromomethane	74-83-9	ug/l	7	NS	NS	NS	--		<1	<1	<1
Carbon Tetrachloride	56-23-5	ug/l	5	*5*	0.46	0.46	3.44		<1	<1	<1
Chlorobenzene	108-90-7	ug/l	100	100	NS	NS	0.89		<1	<1	<1
Chloroethane	75-00-3	ug/l	21,000	NS	NS	NS	6.60		<1	<1	<1
Chloroform	67-66-3	ug/l	80	80	0.22	0.22	2.94		<1	<1	<1
Chloromethane	74-87-3	ug/l	190	NS	NS	NS	--		<1	<1	<1
cis-1,3-Dichloropropene	10061-01-5	ug/l	NS	NS	NS	NS	*0.55*		<1	<1	<1
Dibromochloromethane	124-48-1	ug/l	80	80	0.87	0.87	--		<1	<1	<1
Methylene Chloride	75-09-2	ug/l	5	*5*	11	11	13.15		**1.5 j**	**1.2 j**	**1.1 j**
Tetrachloroethene	127-18-4	ug/l	*5*	*5*	11	11	2.59		<1	<1	<1
Toluene	108-88-3	ug/l	1,000	1,000	NS	NS	8.03		<1	<1	<1
trans-1,2-Dichloroethene	156-60-5	ug/l	100	100	NS	NS	*0.55*		<1	<1	<1
trans-1,3-Dichloropropene	10061-02-6	ug/l	NS	NS	NS	NS	--		<1	<1	<1
Trichloroethene	79-01-6	ug/l	5	5	0.49	0.49	--		<1	<1	<1
Vinyl Chloride	75-01-4	ug/l	2	2	0.019	0.019	1.94		<1	<1	<1

Notes

NS = No Standard

-- = Not measured

Exceeds one or more standards/comparisons

Detected above Method Detection Limit

Method Detection Limit

ROCKY RIDGE QUARRY

TABLE 3

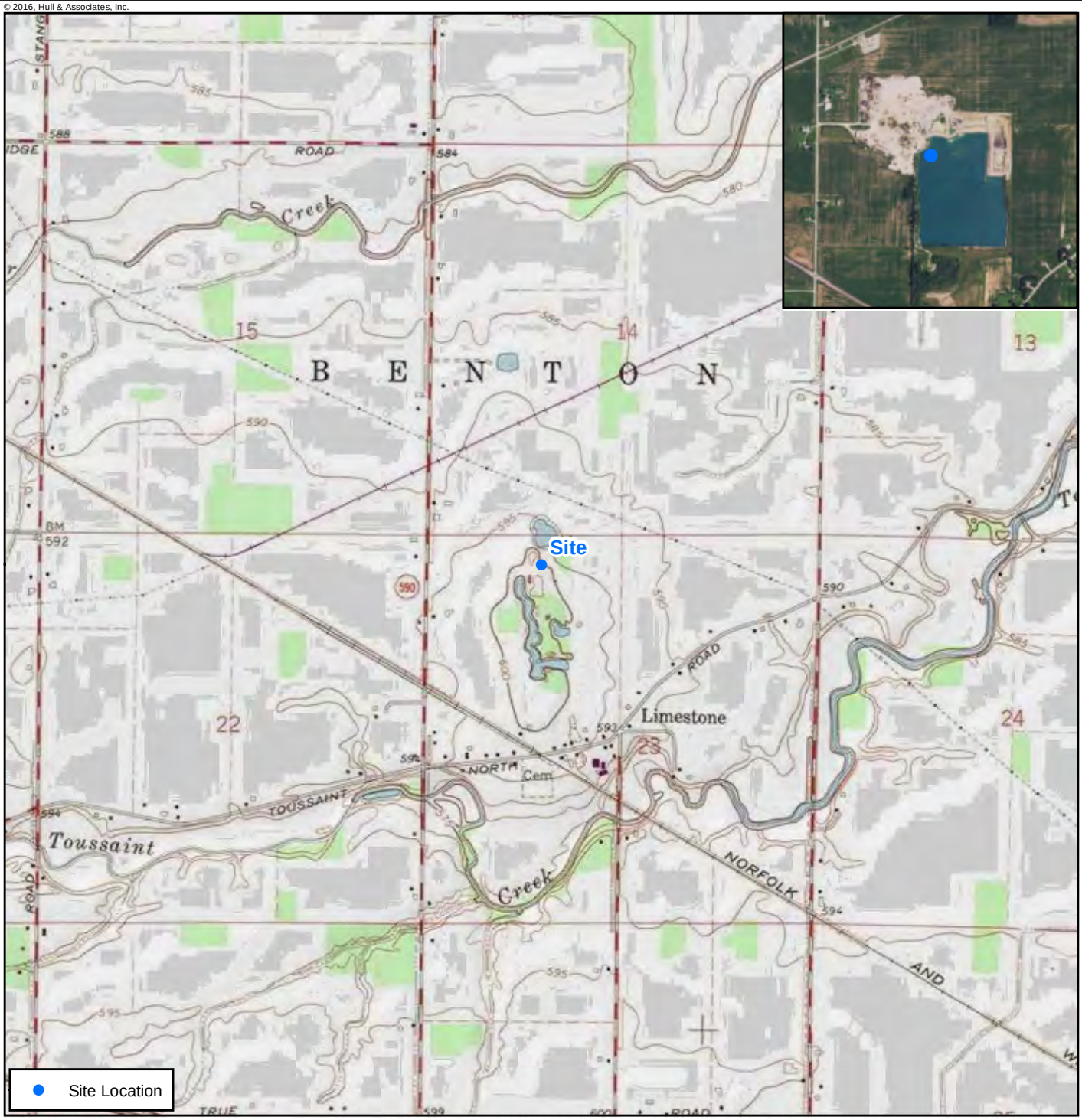
SUMMARY OF SOIL/E-2 DWTM BLEND SPLP RESULTS

Parameters	CAS number	Units	2014 VAP Generic Unrestricted Potable Use Standard	Drinking Water Regulations Primary and Secondary Standards	May 2016 Residential Soil to GW RSL THQ=0.1	May 2016 Residential Soil to GW RSL. THQ=1.0	Elmore Water Works Ambient Groundwater Data (2013)	Station Name	33/66 Soil/DWTM	50/50 Soil/DWTM	66/33 Soil/DWTM
								Sample Date	5/16/2016	5/16/2016	5/16/2016
								FieldSampleID	RCK001:33/66:S05161 6	RCK001:50/50:S05161 6	RCK001:66/33:S05161 6
SW8270C											
1,2-Diphenylhydrazine	122-66-7	ug/l	0.67	NS	0.078	0.078	--		<1.2	<1.1	<1.1
2,4,6-Trichlorophenol	88-06-2	ug/l	9	NS	4.1	4.1	*0.51*		<1.2	<1.1	<1.1
2,4-Dichlorophenol	120-83-2	ug/l	35	NS	NS	NS	*0.50*		<1.2	<1.1	<1.1
2,4-Dimethylphenol	105-67-9	ug/l	270	NS	NS	NS	*0.52*		<1.2	<1.1	<1.1
2,4-Dinitrophenol	51-28-5	ug/l	30	NS	NS	NS	*0.55*		<5.8	<5.3	<5.3
2,4-Dinitrotoluene	121-14-2	ug/l	2	NS	0.24	0.24	2.12		<1.2	<1.1	<1.1
2,6-Dinitrotoluene	606-20-2	ug/l	0.42	NS	0.049	0.049	*0.50*		<1.2	<1.1	<1.1
2-Chlorophenol	95-57-8	ug/l	71	NS	NS	NS	*0.55*		<1.2	<1.1	<1.1
2-Nitrophenol	88-75-5	ug/l	NS	NS	NS	NS	*0.50*		<1.2	<1.1	**0.88 j**
3,3-Dichlorobenzidine	91-94-1	ug/l	1.1	NS	0.13	0.13	--		<5.8	<5.3	<5.3
4,6-Dinitro-o-cresol	534-52-1	ug/l	NS	NS	NS	NS	*0.51*		<1.2	<1.1	<1.1
4-Bromophenyl-phenylether	101-55-3	ug/l	NS	NS	NS	NS	5.30		<1.2	<1.1	<1.1
4-Chloro-3-methylphenol	59-50-7	ug/l	1,100	NS	NS	NS	--		<1.2	<1.1	<1.1
4-Chlorophenyl-phenylether	7005-72-3	ug/l	NS	NS	NS	NS	--		<1.2	<1.1	<1.1
4-Nitrophenol	100-02-7	ug/l	NS	NS	NS	NS	*0.55*		<5.8	<5.3	<5.3
Acenaphthene	83-32-9	ug/l	400	NS	NS	NS	*0.51*		<0.12	<0.11	<0.11
Acenaphthylene	208-96-8	ug/l	NS	NS	NS	NS	*0.51*		<0.12	<0.11	<0.11
Anthracene	120-12-7	ug/l	1,300	NS	NS	NS	*0.50*		<0.12	<0.11	<0.11
Benzidine	92-87-5	ug/l	0.0029	NS	0.00011	0.00011	--		<5.8	<5.3	<5.3
Benzo(a)anthracene	56-55-3	ug/l	0.92	NS	0.012	0.012	*0.50*		<0.12	<0.11	<0.11
Benzo(a)pyrene	50-32-8	ug/l	0.2	0.2	0.0034	0.0034	*0.50*		<0.12	<0.11	<0.11
Benzo(b)fluoranthene	205-99-2	ug/l	0.92	NS	0.034	0.034	*0.50*		<0.12	<0.11	<0.11
Benzo(g,h,i)perylene	191-24-2	ug/l	NS	NS	NS	NS	*0.50*		<0.12	<0.11	<0.11
Benzo(k)fluoranthene	207-08-9	ug/l	9.2	NS	0.34	0.34	*0.50*		<0.12	<0.11	<0.11
Bis(2-chloroethoxy) methane	111-91-1	ug/l	46	NS	NS	NS	*0.51*		<1.2	<1.1	<1.1
Bis(2-chloroethyl) ether	111-44-4	ug/l	0.12	NS	0.014	0.014	*0.50*		<1.2	<1.1	<1.1
Bis(2-chloroisopropyl) ether	108-60-1	ug/l	3.1	NS	NS	NS	2.12		<1.2	<1.1	<1.1
Bis(2-ethylhexyl) Phthalate	117-81-7	ug/l	6	6	5.6	5.6	0.68		<1.2	<1.1	<1.1
Butyl Benzyl Phthalate	85-68-7	ug/l	140	NS	16	16	*0.50*		<1.2	<1.1	<1.1
Chloronaphthalene, Beta-	91-58-7	ug/l	550	NS	NS	NS	--		<0.12	<0.11	<0.11
Chrysene	218-01-9	ug/l	92	NS	3.4	3.4	*0.50*		<0.12	<0.11	<0.11
Dibenz(a,h)anthracene	53-70-3	ug/l	0.092	NS	0.0034	0.0034	*0.50*		<0.12	<0.11	<0.11
Diethyl Phthalate	84-66-2	ug/l	11,000	NS	NS	NS	*0.51*		<1.2	<1.1	<1.1
Dimethyl phthalate	108-87-2	ug/l	NS	NS	NS	NS	5.30		<1.2	<1.1	<1.1
Di-n-butyl Phthalate	84-74-2	ug/l	670	NS	NS	NS	*0.51*		**0.31 j**	<1.1	**0.31 j**
Di-n-Octyl Phthalate	117-84-0	ug/l	160	NS	NS	NS	--		<1.2	<1.1	<1.1
Fluoranthene	206-44-0	ug/l	630	NS	NS	NS	*0.50*		**0.19**	<0.11	<0.11
Fluorene	86-73-7	ug/l	220	NS	NS	NS	*0.50*		<0.12	<0.11	<0.11
Hexachlorobenzene	118-74-1	ug/l	1	1	0.0098	0.0098	2.12		<1.2	<1.1	<1.1
Hexachlorobutadiene	87-68-3	ug/l	2.6	NS	0.14	0.14	2.12		<1.2	<1.1	<1.1
Hexachlorocyclopentadiene	77-47-4	ug/l	50	50	NS	NS	*0.50*		<5.8	<5.3	<5.3
Hexachloroethane	67-72-1	ug/l	5.1	NS	0.33	0.33	5.30		<1.2	<1.1	<1.1
Indeno(1,2,3-c,d)pyrene	193-39-5	ug/l	0.92	NS	0.034	0.034	*0.50*		<0.12	<0.11	<0.11
Naphthalene	91-20-3	ug/l	1.4	NS	0.17	0.17	0.50		<0.12	<0.11	<0.11
Nitrobenzene	98-95-3	ug/l	1.2	NS	0.14	0.14	*0.50*		<1.2	<1.1	<1.1
n-Nitrosodimethylamine	62-75-9	ug/l	0.013	NS	0.00011	0.00011	--		<1.2	<1.1	<1.1
n-Nitroso-di-N-propylamine	621-64-7	ug/l	0.093	NS	0.011	0.011	*0.50*		<1.2	<1.1	<1.1
n-Nitrosodiphenylamine	86-30-6	ug/l	100	NS	12	12	*0.50*		<1.2	<1.1	<1.1
Pentachlorophenol	87-86-5	ug/l	1	1	0.041	0.041	*0.65*		<5.8	<5.3	<5.3
Phenanthrene	85-01-8	ug/l	NS	NS	0.0098	0.0098	*0.50*		<0.12	<0.11	<0.11
Phenol	108-95-2	ug/l	4,500	NS	NS	NS	*0.50*		<1.2	<1.1	<1.1
Pyrene	129-00-0	ug/l	87	NS	0.041	0.041	*0.50*		<0.12	<0.11	<0.11
SW9012B											
Total Cyanide	57-12-5	ug/l	200	200	NS	NS	*10.00*		<5	<5	<5
SW9040C											
pH	NA	s.u.	NS	6.5-8.5 °	NS	NS	7.08		**9.5**	**9.4**	**9.3**

Notes
NS = No Standard
-- = Not measured
Exceeds one or more standards/comparisons

Detected above Method Detection Limit
Method Detection Limit

FIGURES



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0 500 1,000 2,000 Feet

1:24,000

Quad: Oak Harbor

Source: The topographic map was acquired through the USGS Topographic Map web service.

The aerial photo in the inset was acquired through the ESRI Imagery web service. Aerial photography dated 2015.

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Rocky Ridge Quarry

Site Location Map

14591 W. Toussaint North
Graytown, Ottawa County, Ohio

Date:

July 2016

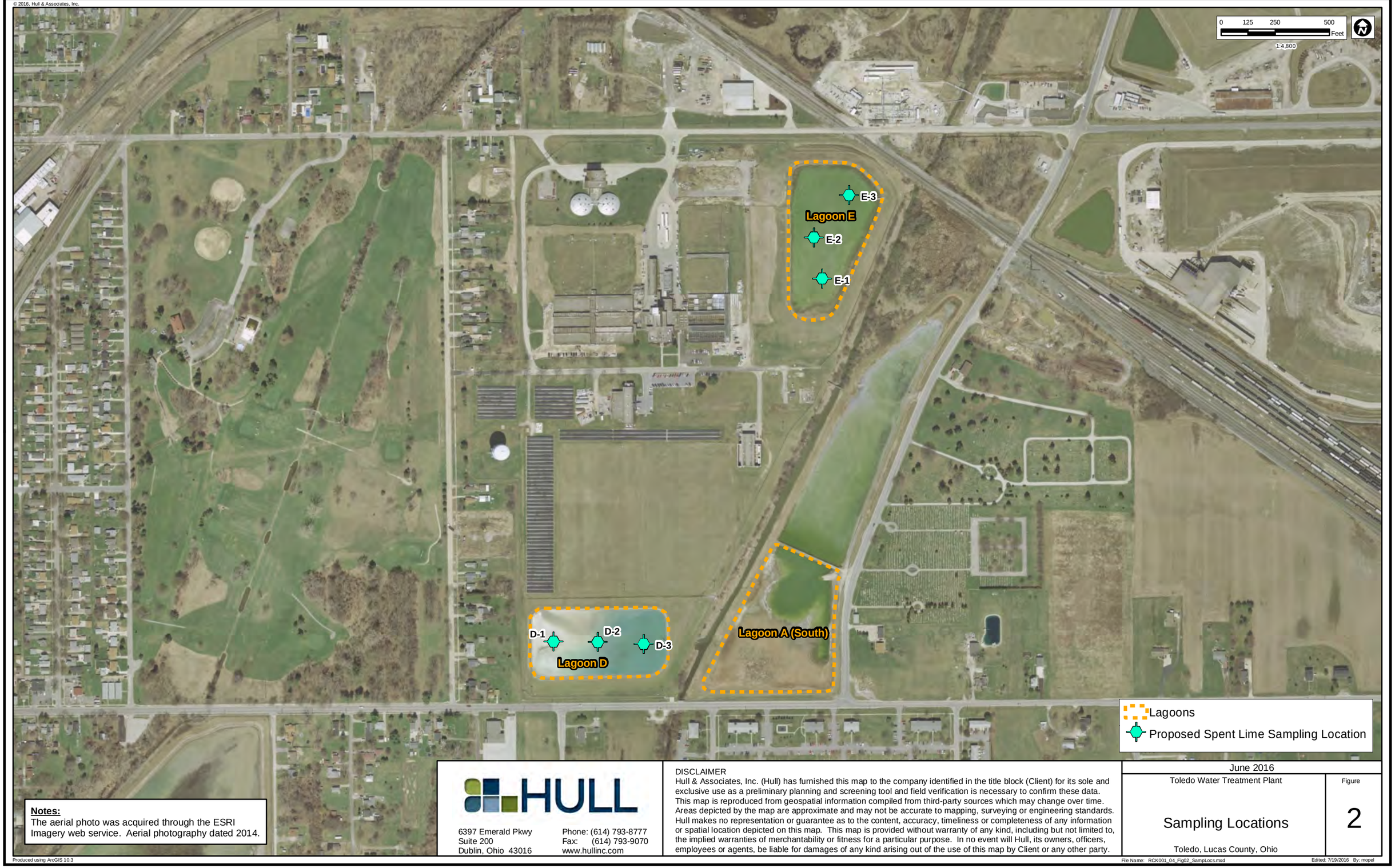
File Name:
RCK001_01_Fig01_SiteLocMap.mxd

Edited: 7/19/2016 By: mopel

Figure

1

Produced using ArcGIS 10.3



Notes:
The aerial photo was acquired through the ESRI Imagery web service. Aerial photography dated 2014.

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June 2016

Toledo Water Treatment Plant

Sampling Locations

Toledo, Lucas County, Ohio

Figure 2

Produced using ArcGIS 10.3

File Name: RCK001_04_Fig02_SampLocs.mxd

Edited: 7/19/2016 By: mopel

APPENDIX A

Field Sampling and Analysis Plan

Memorandum

TO: John Taddonio, Rocky Ridge Development LLC

FROM: William Petruzzi and J Matthew Beil, Hull & Associates, Inc.

DATE: March 21, 2016

RE: Field Sampling and Analysis Plan for Collection of Spent Lime from the Lagoons at the City of Toledo Collins Park Water Treatment Plant; RCK001.100.0012

INTRODUCTION

As part of the Initial Characterization Study related to the proposed spent lime beneficial use project of the Rocky Ridge Quarry located at 14591 W. Toussaint North in Graytown, Ottawa County, Ohio. This Field Sample and Analysis Plan (FSAP) has been prepared to outline the methods of sample collection, analysis, and data evaluation. This memorandum was prepared to establish basic standard operating procedures (SOPs) and guidelines to assist Rocky Ridge Development, LLC (Rocky Ridge) with field sampling.

SAMPLE AND FIELD DATA COLLECTION

Three composite samples of spent lime will be collected from each lagoon, for a total of nine (9) samples, as shown on Figure 1 in Attachment A. Summary tables for the proposed sampling is provided in Attachment B. Spent lime samples will be collected in accordance with Hull SOP F-3027 *Sampling With a Push-Tube Core Sampler*. Decontamination will be completed in accordance with Hull SOP F-1000.R1. Sample nomenclature is provided in Hull SOP F3041.R0. A chain of custody will be completed in accordance with Hull SOP F3014.RO. Applicable SOPs are included in Attachment C.

Depending on the method used, a Test Pit Field Log or Soil Boring Log, as provided in Attachment D, should be filled out for each sample documenting any change in physical appearance with depth. Photographs should be taken of each sample and the sample location, depth of sample, and other pertinent information noted for each photograph.

Each sample should be collected such that the entire profile of the existing spent lime can be discerned to the extent possible. Samples should be collected using a direct push method to drive a Lexan or stainless steel pipe (or equivalent) until refusal or base of the spent lime lagoon. The core will be pushed vertically from surface to bottom of lagoon. The core will be extracted and logged/photographed. The length of tubing obtained should take into account both the depth of the planned sediment core and the depth of any standing water under which the sediment core is to be taken. The top of the pipe should be capped and the sample tube removed until the bottom of the pipe can be capped immediately upon reaching the surface. The sample should be pushed or pulled out of the tube onto a clean surface or into new clean food grade 5-gallon buckets and homogenized using a decontaminated stainless steel spoon. Samples should be logged, described, measured and photographed prior to placing into laboratory sample jars. Laboratory jars should be filled completely and lids tightly secured. Samples should be labeled according to Hull SOP F3041.R0.

For example:

For Lagoon D Sample Point #1 from 0.0 feet to 8.0 feet
Sample ID: RCK001:D-1:P000080

For Lagoon A Sample Point #2 from 0.0 feet to 4.5 feet
Sample ID: RCK001:A-2:P000045

Sufficient volume must be collected both for the chemical and geotechnical analyses and to create the blends. At least two (2) 5-gallon buckets should be collected for each sample location, for a total of 6 buckets per lagoon. Once material is collected and logged from each sample location, the sample should be homogenized prior to filling the analytical laboratory jars.

Once the analytical laboratory sample jars are filled, leftover spent lime from each sample location should be composited *per lagoon* such that there is at least five (5) 5-gallon buckets per lagoon shipped to the geotechnical laboratory. Representative samples should be collected and homogenized prior to shipping to the geotechnical laboratory.

In addition to the lime characterization sampling, samples need to be collected and sent to a geotechnical laboratory for analysis. Hull recommends that four (4) samples be collected of the onsite native clayey material that Rocky Ridge anticipates using as the soil component of the lime/soil blend. The sample locations should vary in both horizontal and vertical extents as to generally represent the materials that will be utilized in the blending process. Similar to the lime characterization, each native clayey soil sample should be logged, described, measured and photographed prior to placing into 5-gallon buckets for submittal to the laboratory.

These buckets should be labeled appropriately, and a Soils Lab chain of custody form, as provided in Appendix D, completed. Materials can be decontaminated at the lagoon with clean water and discarded as solid waste appropriately.

SAMPLE ANALYSIS

Samples will be placed on ice and shipped to ALS Laboratory in accordance with Hull SOP F1013.R0. The samples will be analyzed for the parameters listed on the tables provided in Attachment B. The 5-gallon buckets should be shipped to the Hull Geotechnical Laboratory.

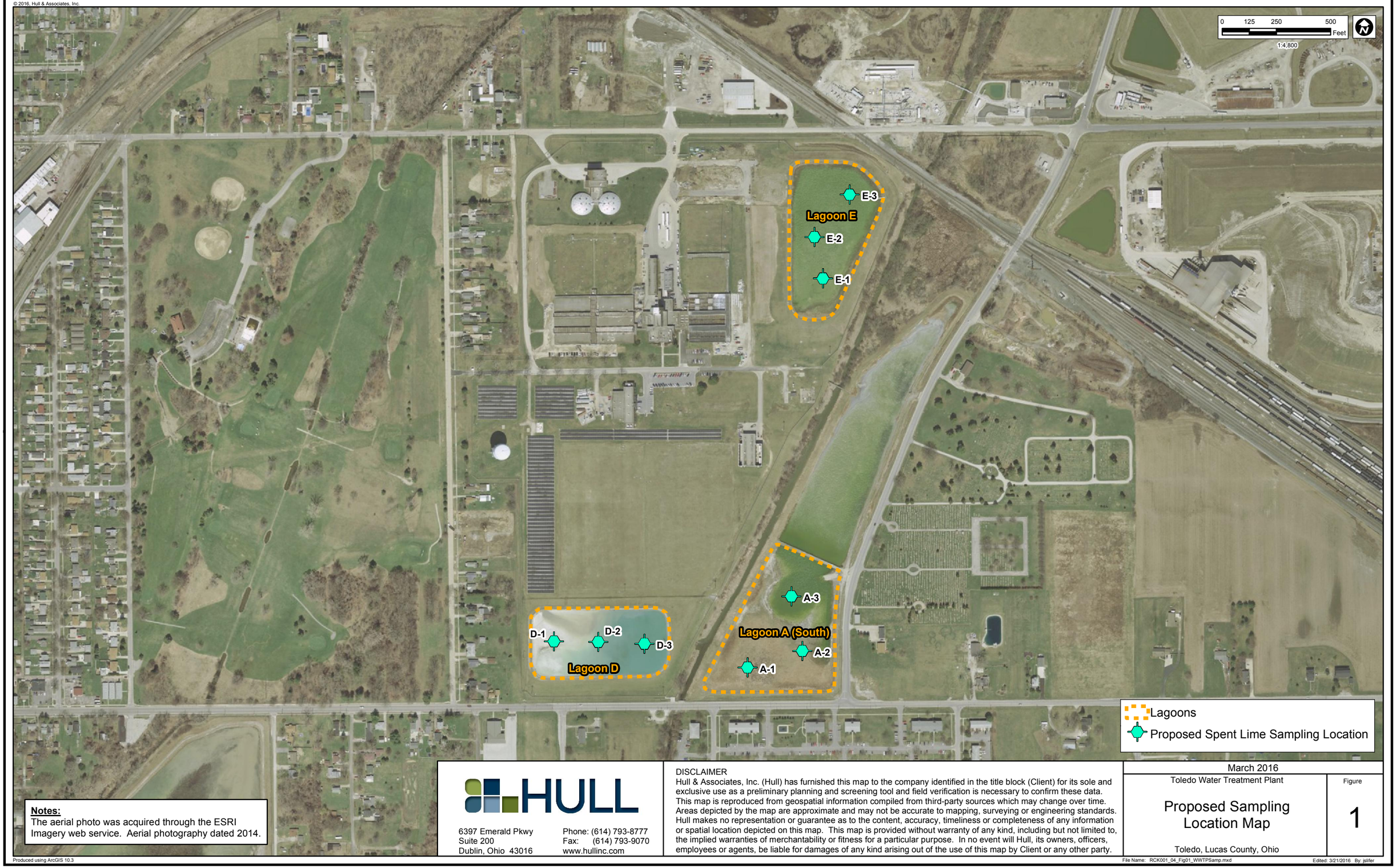
Data will be reported by the analytical laboratory at the lowest practical quantitation limit (PQL) that can reliably be achieved.

DATA EVALUATION AND REPORTING

Data will be reviewed for quality control/quality assurance. A table summarizing the data, basic statistics, and comparisons to applicable standards listed in the tables in Attachment B will be completed.

ATTACHMENT A

Figure



Notes:
The aerial photo was acquired through the ESRI Imagery web service. Aerial photography dated 2014.

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March 2016

Toledo Water Treatment Plant

Proposed Sampling Location Map

Toledo, Lucas County, Ohio

Figure 1

Produced using ArcGIS 10.3

File Name: RCK001_04_Fig01_WWTPSamp.mxd

Edited: 3/21/2016 By: jslifer

ATTACHMENT B

Tables

Table 1
Summary of Totals and Geotechnical Analyses for Spent Lime

Chemical Sampling Parameter	Lab Chemical Sampling Method	# of Samples	Applicable Target Standards
pH	SW9045D	3 composite samples per lagoon (9 total samples)	1. Ohio Voluntary Action Program (VAP) - Residential Category 2. USEPA Region 9 Regional Screening Levels - Residential Category 3. Ohio Background Metals (Cox and Colvin)
Organic Carbon - Walkley-Black	TITRAMETRIC		
Chemical Oxygen Demand	E410.4 R2.0		
Biochemical Oxygen Demand	A5210B-97		
Chloride	A4500-Cl E-97		
Metals by ICP-MS Na, Mg, K	SW6020A		
Nitrogen, Total Kjeldahl	A4500-NH3 G-97		
Nitrogen, Total	Calculation		
Nitrogen, Total Inorganic	Calculation		
Nitrogen, Total Organic	Calculation		
Nitrogen, Nitrite	A4500-NO2 B		
Nitrogen, Nitrate	E353.2		
Nitrogen, Nitrate-Nitrite	E353.2		
Ammonia as Nitrogen	A4500-NH3 G-97		
Phosphorus, Total	E365.1 R2.0		
Phosphorus, Ortho-P (As P)	A4500-P E-97		
Priority Pollutant VOCs	SW8260B		
Priority Pollutant SVOCs	SW8270C		
PCBs	SW8082		
Priority Pollutant Pesticides	SW8081A		
Cyanide, Total	SW9012B		
Metals by ICP-MS	SW6020A		
Priority Pollutant Metals, Mercury by CVAA	SW7471A		
Geotechnical Sampling Parameter	**Geotechnical Sampling Method**		**Applicable Target Standards**
USCS: Particle Size	ASTM D2487 / ASTM D422		Not Applicable
Moisture Content by Mass	ASTM D2216		
Liquid Limit	ASTM D4318		
Plastic Limit			

Notes

1. Rocky Ridge will collect, pack, and ship 3 composite samples from each lagoon to the analytical laboratory. Each composite sample will characterize the entire depth of lime material. See Figure 2 for proposed sampling locations.

2. Rocky Ridge will collect five (5) buckets of the lime from each lagoon (15 total buckets) for use in preparing lime/soil blends for further testing. Each lagoon should be appropriately labeled (e.g., Lagoon D-1, Lagoon D-2, etc.)

3. Rocky Ridge will be responsible for all data collection, field reports and general documentation of field activities during the lime characterization.

Table 2
Summary of Totals and Geotechnical Analyses for Lime/Soil Blends

Chemical Sampling Parameter	Lab Chemical Sampling Method	# of Samples	Applicable Target Standards
pH	SW9045D	3 composite samples per blend (9 total samples)	1. Ohio Voluntary Action Program (VAP) - Residential Category 2. USEPA Region 9 Regional Screening Levels - Residential Category 3. Ohio Background Metals (Cox and Colvin)
Organic Carbon - Walkley-Black	TITRAMETRIC		
Chemical Oxygen Demand	E410.4 R2.0		
Biochemical Oxygen Demand	A5210B-97		
Chloride	A4500-Cl E-97		
Metals by ICP-MS Na, Mg, K	SW6020A		
Nitrogen, Total Kjeldahl	A4500-NH3 G-97		
Nitrogen, Total	Calculation		
Nitrogen, Total Inorganic	Calculation		
Nitrogen, Total Organic	Calculation		
Nitrogen, Nitrite	A4500-NO2 B		
Nitrogen, Nitrate	E353.2		
Nitrogen, Nitrate-Nitrite	E353.2		
Ammonia as Nitrogen	A4500-NH3 G-97		
Phosphorus, Total	E365.1 R2.0		
Phosphorus, Ortho-P (As P)	A4500-P E-97		
Priority Pollutant VOCs	SW8260B		
Priority Pollutant SVOCs	SW8270C		
PCBs	SW8082		
Priority Pollutant Pesticides	SW8081A		
Cyanide, Total	SW9012B		
Metals by ICP-MS	SW6020A		
Priority Pollutant Metals, Mercury by CVAA	SW7471A		
Geotechnical Sampling Parameter	**Geotechnical Sampling Method**		**Applicable Target Standards**
Standard Proctor	ASTM D4318		Not Applicable
Specific Gravity by Water Pycnometer	ASTM D854		
Hydraulic Conductivity by Flex Wall Permeability	ASTM D5084		

Notes

1. Rocky Ridge will collect 4 representative samples of the native soils (5 buckets for each representative sample) that will be used for lime/soil blending. Three (3) blends of lime/soil will be made: 33/66, 50/50, and 66/33.

2. Blends will be prepared by the geotechnical laboratory and samples shipped to the chemical laboratory.

3. Rocky Ridge will be responsible for all data collection, field reports and general documentation of field activities during the lime characterization.

Table 3
Summary of Synthetic Precipitation Leaching Procedure (SPLP) Analyses for Lime/Soil Blends

SPLP Analysis for Blends[1]			
Chemical Sampling Parameter	**Lab Chemical Sampling Method**	**# of Samples**	**Applicable Target Standards**
pH (laboratory)	SW9040C	Lagoons - up to 3 composite samples per lagoon if totals results exceed MDL (up to 9 total lagoon SPLP samples) Blends - 33/66 Blend - up to 3 composite samples if totals results exceed MDL 50/50 Blend - up to 3 composite samples if totals results exceed MDL 66/33 Blend - up to 3 composite samples if totals results exceed MDL (up to 9 total blend SPLP samples)	OAC 3745-1 and 3745-2 Lake Erie Basin Aquatic Life and Human Health Tier I Criteria, Tier II Values and Screening Levels
Organic Carbon, Total	A5310C-00		
Chemical Oxygen Demand	E410.4 R2.0		
Biochemical Oxygen Demand	A5210B-01		
Chloride	A4500-Cl E-97		
Metals by ICP-MS SPLP/TCLP Na, Mg, K	SW6020A		
Nitrogen, Total Kjeldahl	A4500-NH3 G-97		
Nitrogen, Total	Calculation		
Nitrogen, Total Inorganic	Calculation		
Nitrogen, Total Organic	Calculation		
Nitrogen, Nitrite	A4500-NO2 B		
Nitrogen, Nitrate	E353.2 R2.0		
Nitrogen, Nitrate-Nitrite	E353.2 R2.0		
Ammonia as Nitrogen	A4500-NH3 G-97		
Phosphorus, Total	E365.1 R2.0		
Phosphorus, Ortho-P (As P)	A4500-P E-99		
Volatile Organic Compounds - Aqueous	SW8260B		
SPLP/TCLP Priority Pollutant VOCs			
Semi-Volatile Organic Compounds	SW8270C		
SPLP/TCLP Priority Pollutant SVOCs			
PCBs	SW8082		
SPLP/TCLP			
Pesticides	SW8081A		
SPLP/TCLP Priority Pollutant Pesticides			
Cyanide, Total	SW9012B		
SPLP/TCLP			
Metals by ICP-MS	SW6020A		
SPLP/TCLP Priority Pollutant Metals			
Mercury by CVAA	SW7470A		
SPLP Leach for Wet Chemistry	SW1311		
SPLP Leach for Metals	SW1311		
SPLP Leach for Volatiles	SW1311		
SPLP Leach for Semi-Volatiles	SW1311		

Notes

1. SPLP analysis will only be completed if a total result for that parameter exceeds the Method Detection Limit (MDL). Analytes that are non-detect will not be run for SPLP.

2. Rocky Ridge will be responsible for all data collection, field reports and general documentation of field activities during the lime characterization.

ATTACHMENT C

Standard Operating Procedures

HULL & ASSOCIATES, INC.
STANDARD OPERATING PROCEDURE

Title: Environmental Sample Nomenclature	
Effective Date: 1/17/14	**Document Number:** HULLSOP.F3041.R0

Author

Name: Pam Olson
Title: Hydrogeologist II

Name: Monica Williamson
Title: Sr. Scientist

Signature:  Date: 1/17/14

Signature:  Date: 1/17/14

Approvals

Name: Bill Dennis
Title: Sr. Project Manager

Signature:  Date: 1/17/14

REVISION HISTORY

The table below summarizes changes to this document over time. The most recent version is presented in the top row of the table. Previous versions of the document (if any) are maintained in the archive portion of the Hull Standard Operating Procedure (SOP) library.

History	Effective Date
HULLSOP.F3041.R0 created in January 2014. This document updates a December 9, 2002 Hull memorandum issued by W. Lance Turley to Hull Field Personnel outlining sample nomenclature (Hull Document No. 1000.200.0545).	January 17, 2014

HULLSOP.F3041.R0
ENVIRONMENTAL SAMPLE NOMENCLATURE

1.0 Purpose

This Hull & Associates, Inc. (Hull) Standard Operating Procedure (SOP) describes the nomenclature format to standardize the naming of samples collected during field work.

2.0 Documentation

Sample labels, chain of custody forms and field forms will be filled out using the proper nomenclature, as described in this SOP.

3.0 Special Notes

1. Please ensure the appropriate field forms are filled out to completion to supplement information contained within the sample name. Current field forms are maintained on Hull's intranet. Field forms include, but are not limited to, soil and well boring logs, groundwater sampling field data sheets, air sampling field data sheets and excavation log forms.

2. All sample locations are to be accurately documented on scaled drawings and/or recorded with Global Positioning System (GPS) or other applicable survey method, as dictated by project requirements.

3. In order to avoid entry errors at the laboratory during the sample login process, it is very important to write legibly in capital letters and exaggerate commonly mistaken letters and numbers. Common transcription errors occur from the following characters:

    - "S" and "5"
    - "D" and "O" and "0"
    - "I" and "1"
    - "4" and "9"
    - "2" and "Z"
    - "V" and "U"

4. Some state and federal regulatory programs have specific requirements for sample nomenclature that may need to be followed. The Project Manager should specify if other requirements should be followed instead of, or in addition to, the requirements outlined herein.

4.0 Nomenclature Format

Hull's sample numbering system consists of three distinct input fields separated by colons. These fields are expressed in the form of:

PROJECT_NUMBER:SAMPLE-LOCATION:SAMPLE_TYPE_&_ID

NOTE: Do not put any blank spaces or punctuation other than a hyphen in the sample locations and the required colons separating fields (see examples in subsequent sections).

Project Number

The first field is Hull's project number. The project number will always be 6 characters. Generally, Hull's project numbers are 3 letters followed by 3 numbers (e.g., HAI003).

Sample Location

The second field is the primary sample location identifier (e.g., MW-1, SB-1, SED-3, etc.). The sample location field should be kept to a reasonable length (i.e., 4-8 characters). These characters may consist of letters, numbers, and hyphens. Hull's sample numbers should always include the hyphen (i.e., MW-6, SB-4, etc.). Sample nomenclature within each project must be consistent in order for Hull's data management program (Envirodata) to properly handle the data.

Sample Type & ID

The third field identifies the sample type or matrix and further describes the sample (e.g., sampling date, depth, or sequence). Duplicate samples are also identified in this field.

Sample Matrix

The first character of this field will always identify the matrix. Specifically:

AA – Ambient Air;
D – Sediment;
G – Groundwater;
IA – Indoor Air
P – Product;
S – Soil;
SG – Soil Gas
SS – Subslab Vapor
W – Water (other than groundwater);
X – Concrete; and
Z – all other matrices.

Six Digit Number for Date, Depth or Sequence

A six-digit number will immediately follow the sample matrix character and will indicate the sampling date, depth, or sequence (see the examples in subsequent sections).

- Sample dates are expressed in the form of mm/dd/yy. For example, February 6, 2013 would be indicated by 020613.

- Sample depth intervals are described as a pair of three digit numbers representing the starting and ending depths. The last digit of each depth is reserved for tenths. For example, a sample collected from 2.0 to 3.2 feet would be represented as 020032 (02.0 and 03.2). If samples are collected from greater than 100 feet, a note will be made on the chain of custody, the tenths will be dropped, and the depth intervals will be reported in whole feet.

- Sample depths will be referenced from the ground surface. If samples are collected from a constructed surface such as a floor slab or asphalt drive area, sample depths should be referenced from the constructed surface unless directed otherwise by the Project Manager.

- Sequential-based sampling will be identified by starting with 000001 for the first sample and increased by 1 for each subsequent sample collected. Note: depth- or date-based sample nomenclatures are preferred for most sample numbering systems.

Duplicate Samples

For duplicate samples, an "A" will be placed immediately after the six-digit number. For example, a duplicate sample collected on February 6, 2013 would be 020613A.

5.0 Nomenclature Examples

Examples of valid sample identification numbers for some of Hull's routine sampling activities are described below.

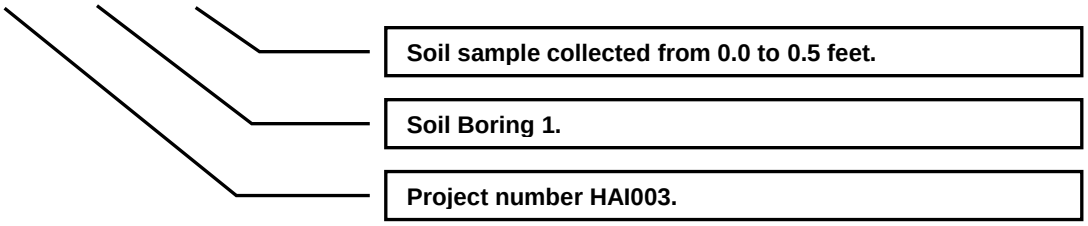
5.1 Soil Samples

The sample type for soil samples is "S" and will be followed by a six digit number to indicate the depth interval the sample was collected from.

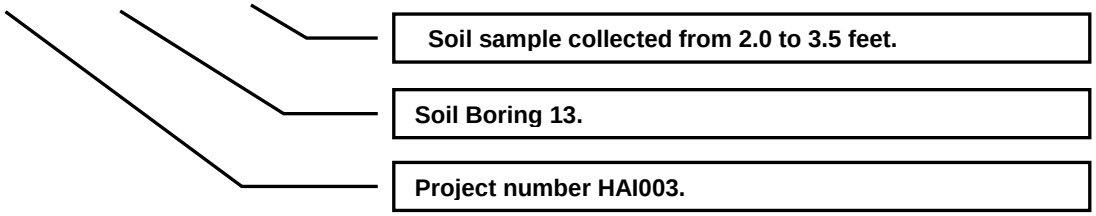
In general, all soil samples will follow this format regardless of method of collection (i.e., split spoons, hand auger, direct push, etc.). Please note that when soil samples are collected from a boring that will be converted into a monitoring well, the sample location will identify the monitoring well location instead of the soil boring location.

Some examples of nomenclature for soil samples follow:

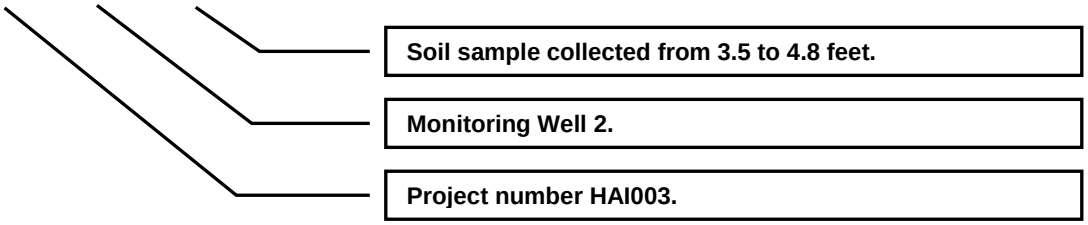
HAI003:SB-1:S000005



HAI003:SB-13:S020035



HAI003:MW-2:S035048

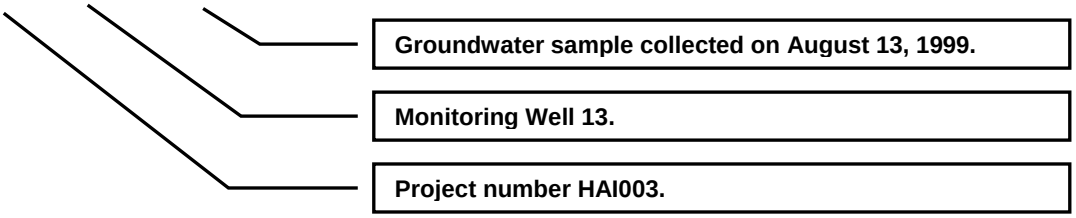


5.2 Water Samples

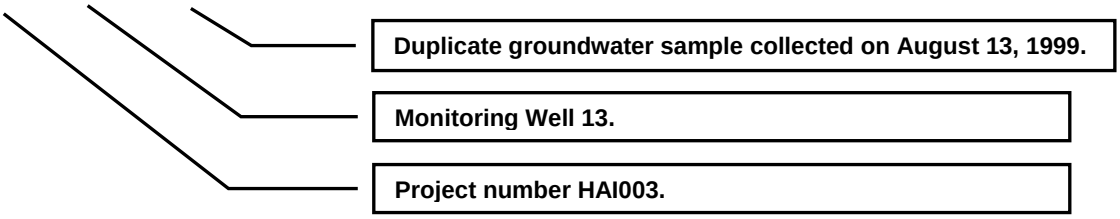
The sample type for water samples will be either "G" for groundwater or "W" for other waters (surface water, stormwater, water in an excavation, field blanks, trip blanks, etc.). The sample type and ID will also include a six-digit number to indicate the date of sample collection.

Some examples of nomenclature for water samples follow:

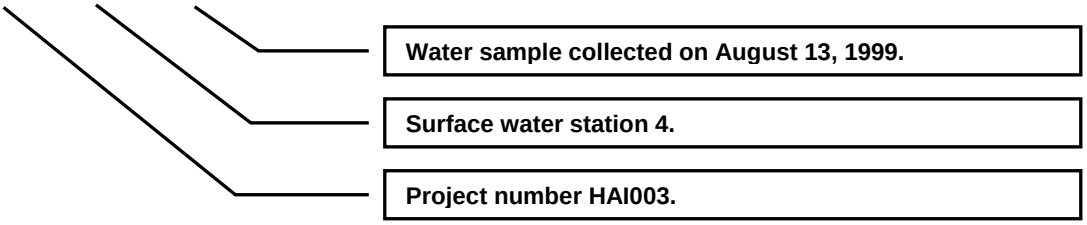
HAI003:MW-13:G081399



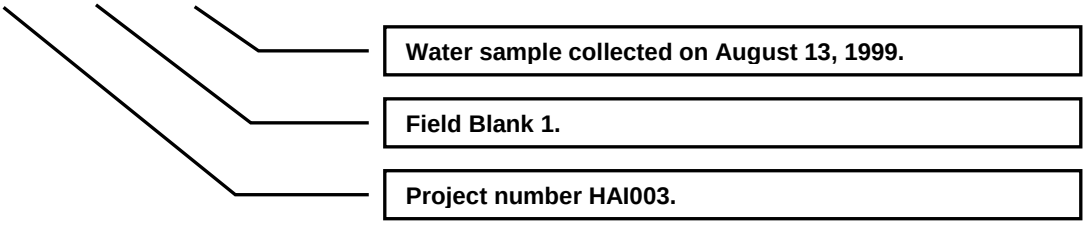
HAI003:MW-13:G081399A



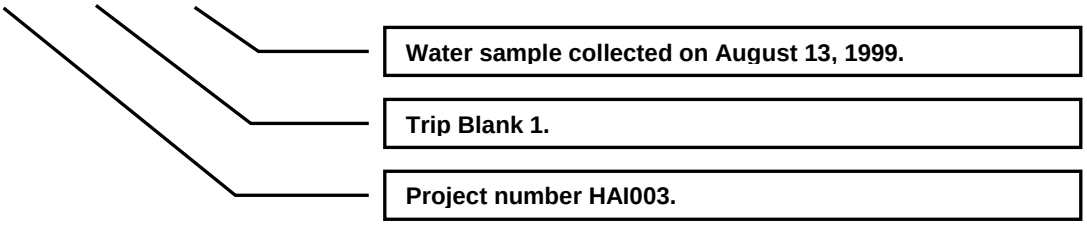
HAI003:SW-4:W081399



HAI003:FB-1:W081399



HAI003:TB-1:W081399

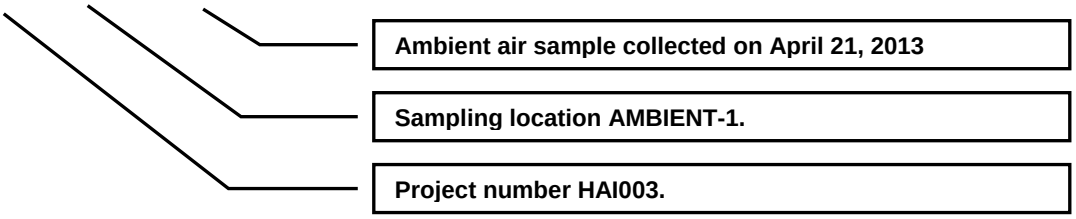


5.3 Air Samples

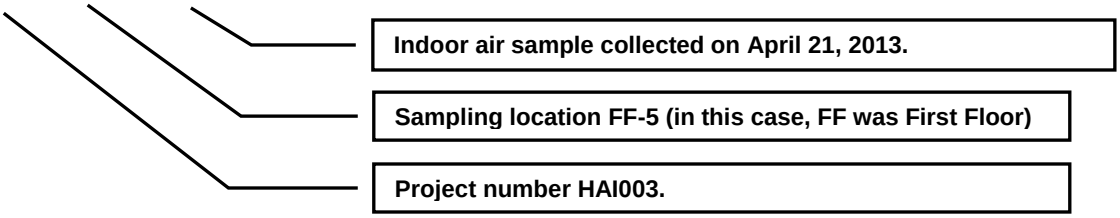
The sample type for air samples will be either “AA” for ambient air, “SG” for soil gas or “SS” for sub-slab vapor. The sample type and ID will also include a six-digit number to indicate the date of sample collection.

Some examples of nomenclature for air samples follow:

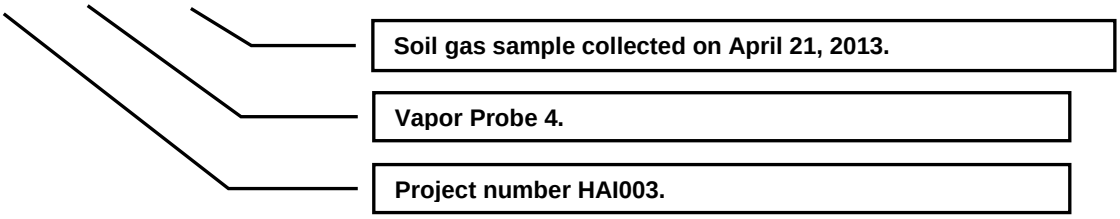
HAI003:AMBIENT-1:AA042113



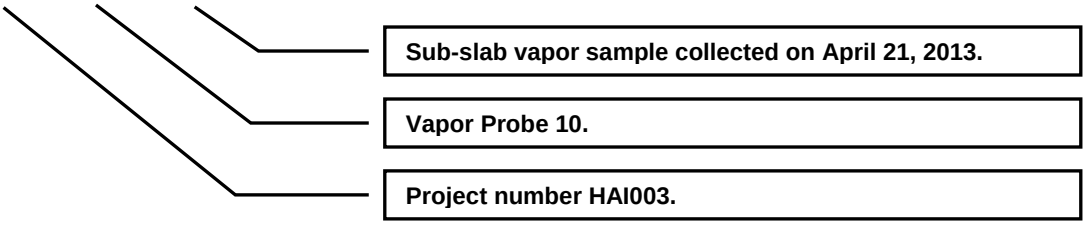
HAI003:FF-5:IA042113



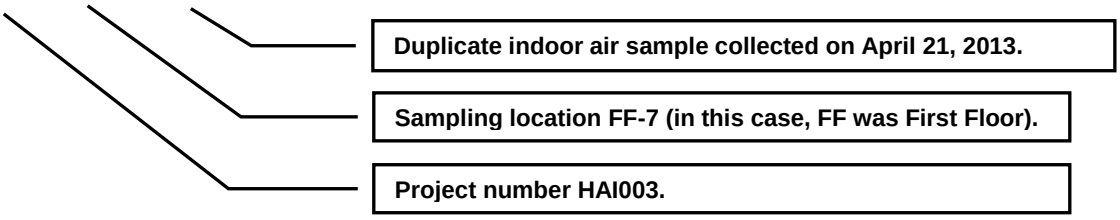
HAI003:VP-4:SG042113



HAI003:VP-10:SS042113



HAI003:FF-7:IA042113A



5.4 Remediation System Samples

The following is a list of sample location codes for the most common sampling points on remediation systems operated by Hull.

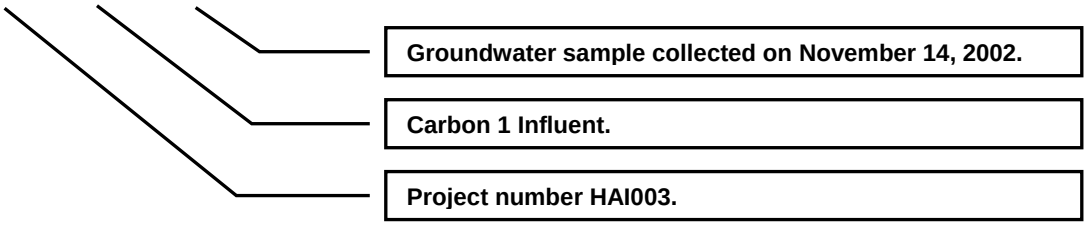
Carbon canisters/vessels/etc.
C1I = carbon 1 influent (first carbon unit in series)
C1E = carbon 1 effluent (carbon 2 influent is same carbon 1 effluent, etc)
C2E = carbon 2 effluent
CE = final carbon discharge

Air Strippers
ASI = air stripper influent
ASE = air stripper effluent

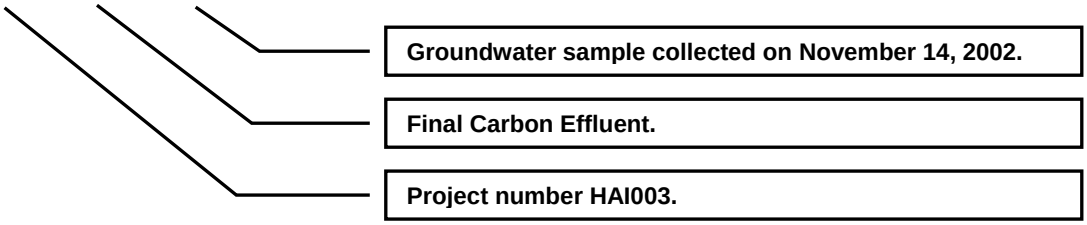
Misc.
OWSE = oil water separator effluent
SVE = soil vapor extraction (CATOX and RETOX influent as well)
CTX = CATOX Effluent
RTX = RETOX Effluent

Some examples of nomenclature for remediation system samples follow:

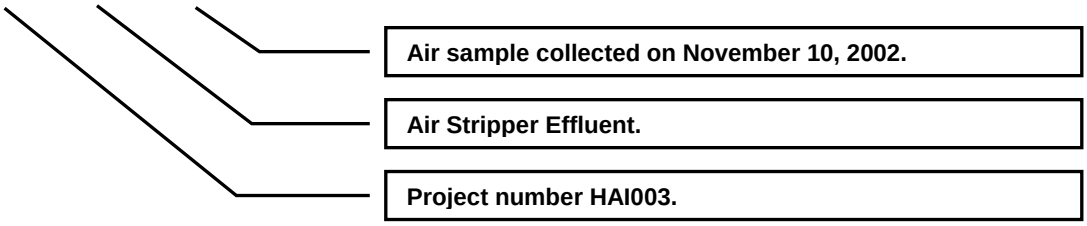
HAI003:C1-I:G111402



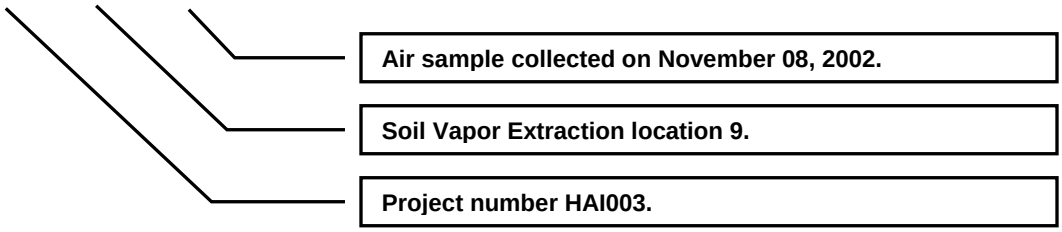
HAI003:CE:G111402



HAI003:ASE:A111002



HAI003:SVE-9:A110802



5.5 Remedial Excavation Confirmation Sampling

Remedial excavations are variable in size, shape, extent and complexity. The discussion below provides a framework for remedial excavation confirmation sample nomenclature. Portions of the nomenclature framework are flexible (e.g., names of remedial areas). The Project Manager must designate the proper nomenclature to be used, as based on the framework below, prior to mobilization. The selected nomenclature should be consistent throughout implementation of the remedy. Field personnel need to accurately document the extent of every excavation and the location of confirmatory samples through appropriate scaled drawings or survey methods as specified by the project requirements.

Remedial excavation sample names will include the following:

- Project number;
- Remedial area as appropriate for the project scope;
- Sample location within the remedial area expressed as cardinal direction with sequential numbers. In addition, letters will be used to indicate excavation lateral limit iterations;
- Sample type; and
- Sample depth.

The remedial area should identify the location of the excavation with a label appropriate for the type of project. Examples of commonly-used excavation location designations are as follows:

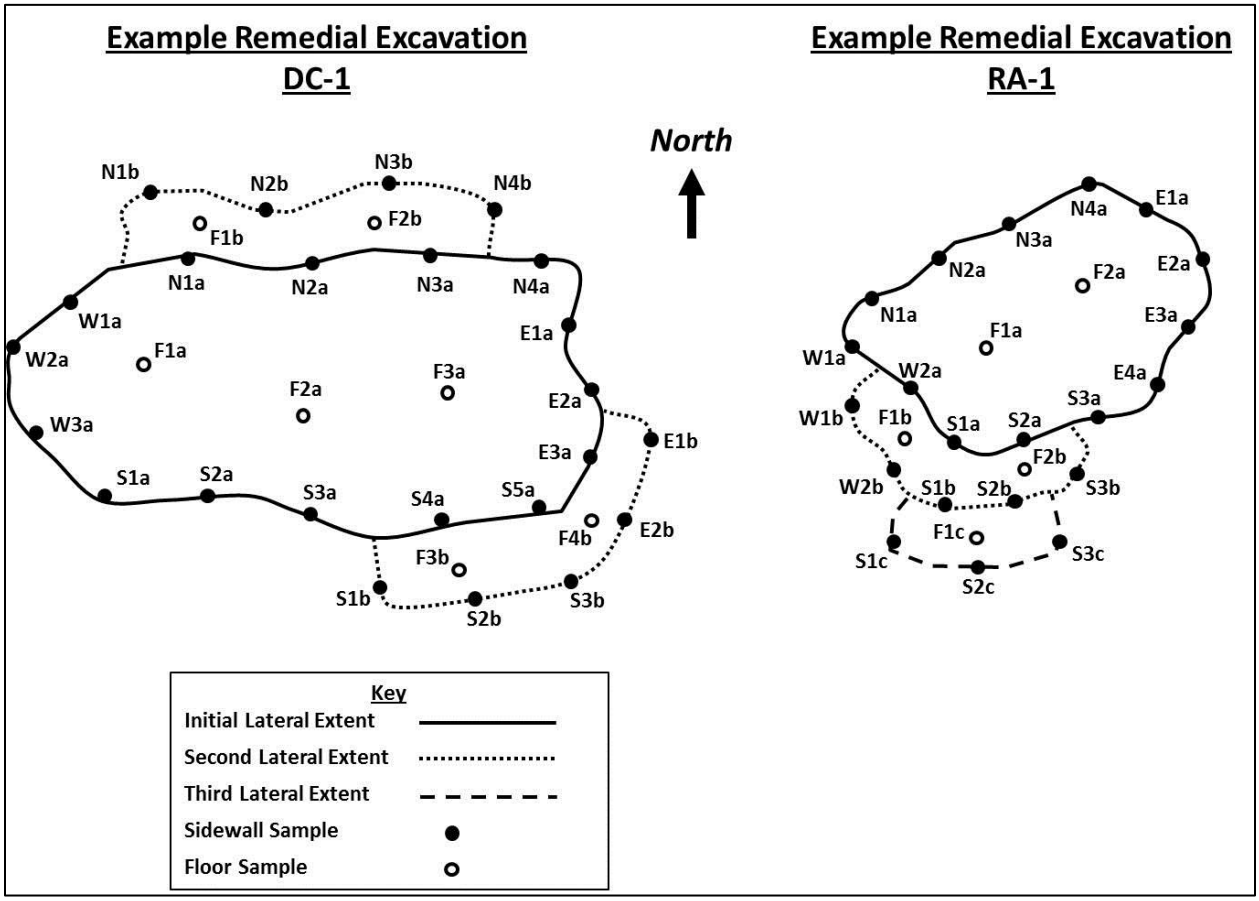
RA-1	Remedial Area #1
IA-1	Identified Area #1
AOC-1	Area of Concern #1
DC-1	Direct Contact Exceedance Area #1
SIA-1	Soil-to-Indoor Air Exceedance Area #1

In general, samples will be collected from the base/floor of the excavation and side walls/edges of the excavation. Samples from the base/floor of the excavation will be denoted as “F” to indicate a floor sample and will be numbered sequentially (F1, F2, etc.). In addition, a letter will follow the numerical sample designation to indicate the excavation limit iteration. For example, samples collected from within the initial lateral extent of the excavation will all be labeled with “a” (F1a, F2a, etc.). In the event that the lateral limits are extended through subsequent excavation iterations, samples collected from within the new limits will be labeled sequentially with “b” for samples within the second lateral extent, “c” for samples within the third lateral extent, etc.

The samples from the side walls/edges of the excavation will be denoted by the cardinal direction of the side wall (i.e. “N”, “S”, “E”, “W”), followed by a sequential number for each sample along the sidewall. Samples along the northern and southern walls will be numbered sequentially moving west to east. Samples along the western and eastern walls will be numbered sequentially moving north to south. In addition, a letter will follow the numerical sample designation to indicate the excavation limit iteration. For example, samples collected

from the initial lateral extent of the excavation will all be labeled with “a” (N1a, N2a, etc.). In the event that the lateral limits are extended through subsequent excavation iterations, samples collected from the new limits will be labeled sequentially with “b” for samples from the second lateral limit, “c” for samples from the third lateral limit, etc.

The remedial excavation numbering system is illustrated in the figure below, with example sample numbers following.



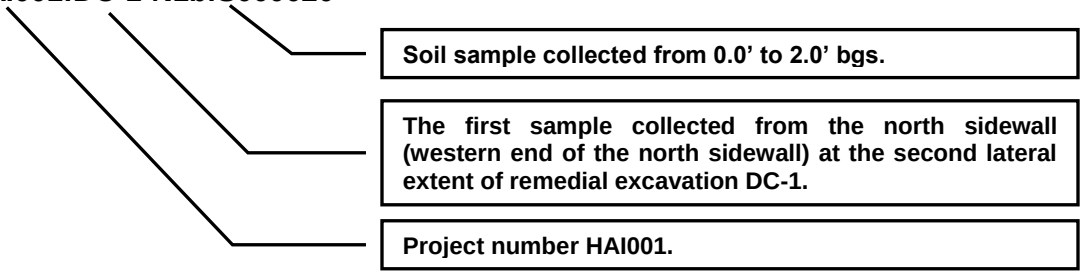
HAI001:DC-1-N1a:S000020

Soil sample collected from 0.0’ to 2.0’ bgs.

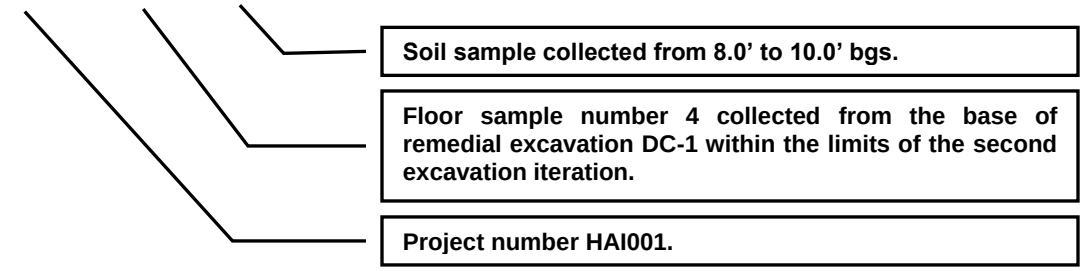
The first sample collected from the north sidewall (western end of the north sidewall) at the initial lateral extent of remedial excavation DC-1.

Project number HAI001.

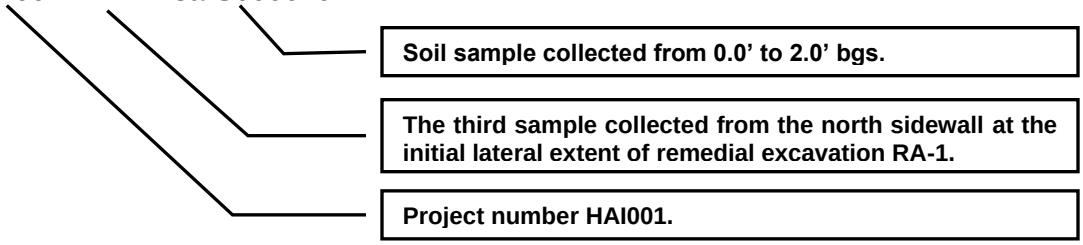
HAI001:DC-1-N1b:S000020



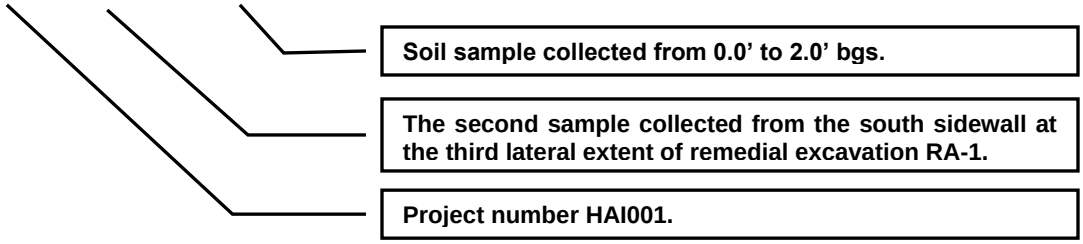
HAI001:DC-1-F4b:S080100



HAI001:RA-1-N3a:S000020



HAI001:RA-1-S2c:S000020



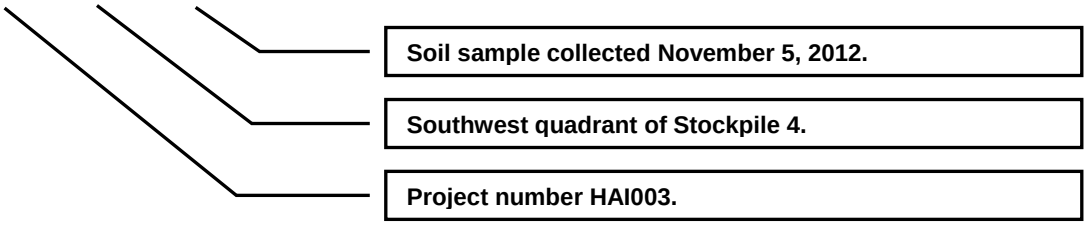
5.6 Stockpile Sampling

The approach for collecting stockpile samples will be dictated by stockpile volume, purpose of the sampling and project-specific requirements. Stockpile sample nomenclature will be dictated by the sampling approach. The Project Manager must designate the proper sampling approach and associated nomenclature to be used prior to mobilization.

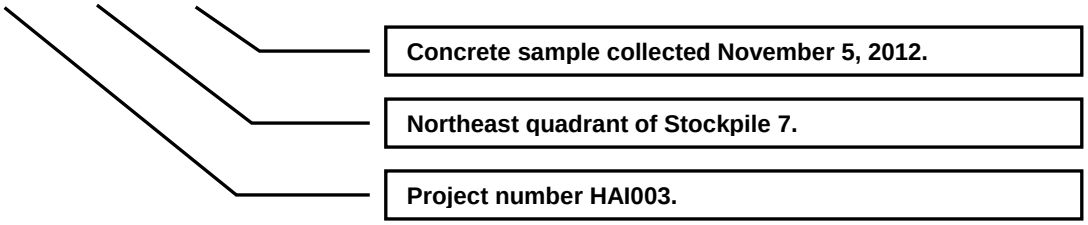
On many projects, stockpiles are characterized by dividing the pile into quarters. Samples are then collected from each quarter using discrete and/or composite sampling methods as required by the project. When using the "quartering approach", sample locations will identify the stockpile number and the quarter from which the sample was collected based on cardinal direction. The six digit number in the sample ID field will identify the sample collection date.

Examples of stockpile sample identification numbers using the "quartering approach" follow:

HAI003:SP-4SW:S110512



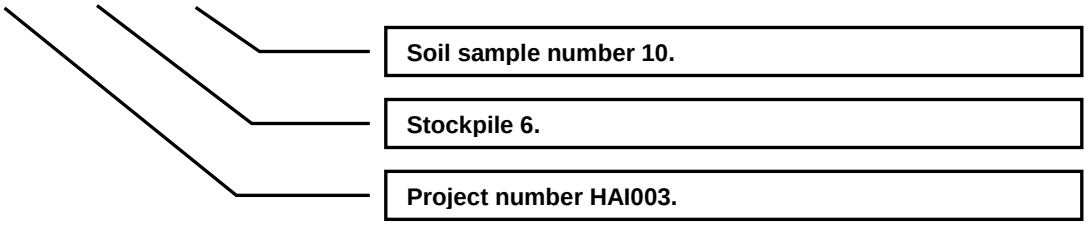
HAI003:SP-7NE:X110512



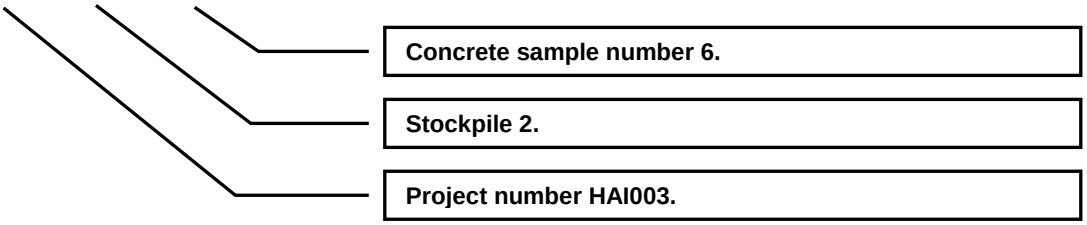
Stockpile samples may also be numbered sequentially if the quartering approach is not used. In these cases, the sample location will identify the stockpile number. The sample ID field will indicate a sequentially-numbered sample designation. The sample ID for each stockpile will begin with 000001 and be sequentially increased thereafter for each sample collected.

Examples of stockpile sample identification numbers using the sequential numbering approach follow:

HAI003:SP-6:S000010



HAI003:SP-2:X000006

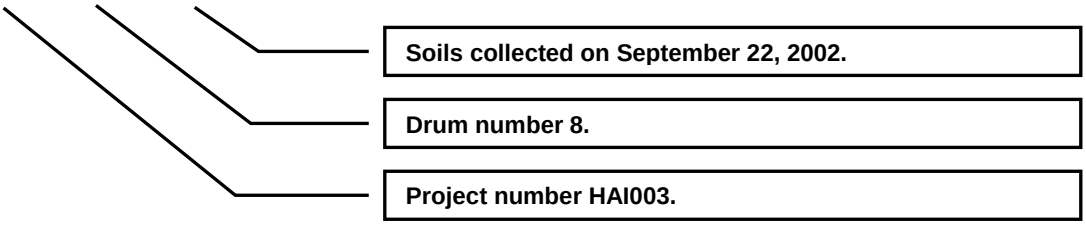


5.7 Drum Sampling

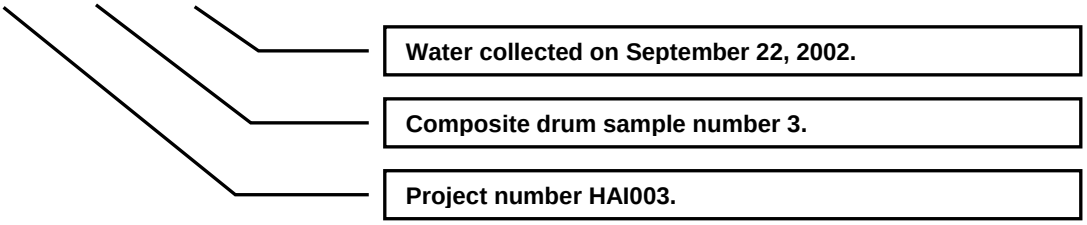
Drum samples may be either discrete or composite samples. Regardless of whether discrete or composite samples will be collected, each drum sample at a site/property will be sequentially numbered. For discrete samples, the sample location will be the drum number (i.e., D-1, D-2, D-3, etc.). Composite drum samples will be identified beginning with DC-1 and sequentially numbered thereafter. It is the sampler's responsibility to record the individual drum numbers that make up each composite sample. In all cases the Sample ID for each sample will be the date of sample collection.

Examples of drum sample designations follow:

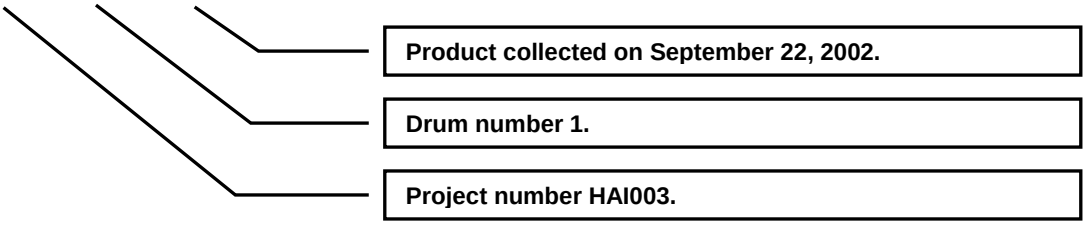
HAI003:D-8:S092202



HAI003:DC-3:W092202



HAI003:D-1:P092202

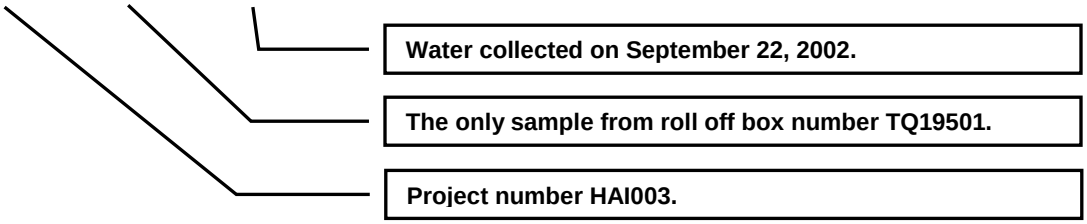


5.8 Roll-off Box Sampling

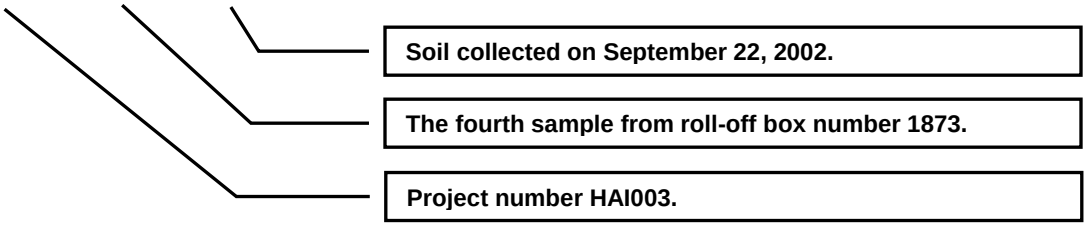
Roll-off box samples are typically collected as composite samples, but in some cases may be collected as discrete samples from multiple points within the roll-off box. If multiple samples are being collected from a roll-off box, after the roll-off box number a hyphen and the sample number will be included in the sample location field (i.e., roll-off box number 18405 with 4 samples will be 18405-1, 18405-2, 18405-3 and 18405-4). If only one sample is being collected from the roll-off box, it is not necessary to include a hyphen and the sample number. The sample type will be either S or W. In all cases the Sample ID for each sample will be the date of sample collection.

Examples of roll-off box sample designations follow:

HAI003:TQ19501:W092202



HAI003:1873-4:S092202



6.0 Standards and References

Turley, W. Lance, *Memorandum Re: Environmental Sampling Nomenclature and Chain-of-Custody Procedures*, Hull & Associates, Inc. - Document No. 1000.200.0545, December 9, 2002.

HULL & ASSOCIATES, INC.
STANDARD OPERATING PROCEDURE

Title: Decontamination of Field Equipment	
Effective Date: 1/22/14	**Document Number: HULLSOP.F1000.R1**
Author	
Name: Monica Williamson Title: Sr. Scientist  Signature: Date: 1/22/14	
Approvals	
Name: Bill Dennis Title: Sr. Project Manager  Signature: Date: 1/22/14	

REVISION HISTORY

The table below summarizes changes to this document over time. The most recent version is presented in the top row of the table. Previous versions of the document (if any) are maintained in the archive portion of the Hull SOP library.

History	Effective Date
HULLSOP.F1000.R1 – created in January 2014 to update the September 2013 version. Modifications to the previous version include: • Pre-installation decontamination of monitoring well materials; and • Specifying that potable water may be used in place of distilled water for final rinsing of all decontaminated equipment.	January 22, 2014
HULLSOP.F1000.R0 – created in September 2013 as part of overall reorganization of Hull's SOP program. While this version supercedes F1000-12REV, the content is substantially equivalent to the 2012 version; only minor editorial modifications were made for additional clarity, and the document name was changed for consistency with Hull's updated SOP nomenclature.	September 10, 2013
F1000-12REV – created in September 2012 to replace 1999 version; superceded in September 2013.	September 2012
F1000-99REV – created in 1999; superceded in September 2012.	1999 (month not recorded)

HULLSOP.F1000.R1
DECONTAMINATION OF FIELD EQUIPMENT

1.0 Purpose

This Hull & Associates, Inc. (Hull) Standard Operating Procedure (SOP) describes the minimum procedures that will be followed when decontaminating field equipment. Equipment may include soil sampling devices, bailers, trowels, shovels, hand augers, drilling rigs, or any other type of reusable equipment used during field investigations.

Decontamination will be performed as both a quality assurance measure and as a safety precaution. Specifically, the purpose for these decontamination procedures is to minimize the potential for cross contamination between sampling locations and prevent potentially contaminated materials from being transported off-site.

2.0 Equipment and Materials

Equipment and materials required for decontamination of field equipment may include, but will not necessarily be limited to:

- power-washer or high-pressure steam cleaner;
- cleaning fluids: non-phosphatic soap and/or detergents, potable water, distilled/deionized water; dilute nitric acid (as applicable);
- shovels and brushes;
- paper towels;
- disposable gloves;
- waste storage containers: plastic bags, drums, boxes;
- cleaning containers: plastic buckets, etc.;
- plastic sheeting; and
- personal protective equipment.

3.0 General

A. All decontamination will be performed under the assumption that the equipment is contaminated. At a minimum, clean, unused vinyl or nitrile gloves will be worn during all decontamination activities. Additional personal protective equipment will be worn as required by the site-specific health and safety plan.

B. An adequate supply of all decontamination equipment and materials will be available on site.

C. All equipment will be decontaminated before leaving the site.

D. Decontamination of vehicles or large equipment will generally be conducted in a designated area. Smaller equipment may be decontaminated near the sampling location.

E. All decontamination materials that cannot be re-used will be properly packaged for disposal based on the nature of contamination.

4.0 Procedures

The following sections present the minimum procedures that will be used to decontaminate field equipment. If different or more extensive procedures are required, they will be pre-approved by the Project Manager and/or Quality Assurance Officer, as appropriate.

4.1 Drilling Rig and Associated Equipment

A. Equipment coming in contact with potential contamination, both as part of subsurface equipment advancement and aboveground contact with drilling fluids, extracted soils, ground water, drill rig lubricants and fuels, etc., will be decontaminated prior to use. At the discretion of the Project Manager, decontamination of the entire drilling rig may be required due to the adherence of foreign substances as a result of operations, transportation from off-site, or travel between soil boring locations.

B. A high-pressure steam cleaner will be used to clean the inside and outside of drilling equipment that will potentially come into contact with test samples. Decontamination of sampling equipment (e.g., split-spoon samplers) is described in section 4.2.

C. All liquid and solid material produced from this operation will be collected and properly contained until such time as it can be properly disposed.

D. The date, time, and decontamination procedure used will be recorded on the boring log, daily field report or in a field notebook, as appropriate.

4.2 Sampling Equipment (split spoons, trowels, etc.)

Sampling equipment will be decontaminated between sample locations and sample intervals to minimize the potential for cross-contamination.

A. The sampler will be completely disassembled and any adhered soil will be removed.

B. The sampler will be placed in a bucket containing a non-phosphatic soap and water (e.g., *Liquinox*™) and scrubbed until visibly clean. The soap and water will be changed as necessary.

C. The sampler will then be thoroughly rinsed with potable water until all soap solution is removed. All rinse water will be collected and containerized.

C. As required by the site-specific work plan, the sampling equipment may be rinsed with a dilute nitric acid solution if metals are analytes of interest.

D. The sampler will be reassembled and given a final rinse with potable water.

E. If the sampler is not to be used immediately, it must be stored in a location or manner that will prevent it from becoming re-contaminated.

4.3 Groundwater Pumps

This procedure will be employed to decontaminate the non-dedicated pumps that are used during well purging, development, and sampling operations.

A. Any dedicated tubing that was used with the pump will be removed and properly discarded.

B. All exterior surfaces will be wiped with clean paper towels and any extraneous materials will be removed using a stiff brush.

C. The pump and all associated downhole equipment will be placed in a suitably sized container of non-phosphatic soap (e.g., *Liquinox*™) and potable water. If the tubing on the pump is to be re-used, the pump will be turned on to circulate the solution through the pump and tubing.

D. The pump will then be thoroughly rinsed with potable water. If the tubing on the pump is to be reused then the pump will be turned on until the internal portions of the pump and tubing are free of cleaning solution. The last rinse applied to the pump system will always be potable water.

F. The pump and associated downhole equipment will be properly stored to ensure that the system remains clean during transportation to other well heads. The pump will not be allowed to come in contact with the ground at any time during handling and transportation. If this occurs, the pump and associated downhole equipment will be re-cleaned.

G. All liquids and waste materials produced during this operation will be properly stored and disposed of as determined by the Project Manager.

4.4 Bailers

Hull's default/preferred procedure is to employ clean, single-use, disposable bailers such that decontamination is not required. In the event that reusable bailers are employed, they will be decontaminated as described below.

A. The bailer will be scrubbed with non-phosphatic soap and water solution. The inside of the bailer will be scrubbed with a cylinder brush to ensure that interior walls are thoroughly cleaned.

B. The bailer will be rinsed with potable water until it is free of the soap solution.

C. As required by the site-specific work plan, the bailer may be rinsed with a dilute nitric acid solution if metals are analytes of interest.

D. A final rinse of potable water will then be applied.

E The bailer will be properly stored if it is not to be immediately used. For proper storage, the entire bailer will be placed in its dedicated storage tube or wrapped in inert material (e.g., *Saran* wrap, aluminum foil, etc.).

F. All liquids and waste materials produced during this operation will be properly stored and disposed of as determined by the Project Manager.

4.5 Well Casing and Screen Pre-Installation Decontamination Procedures

All polyvinyl chloride (PVC) casing and screen materials contained in clean, sealed packaging direct from the manufacturer may be constructed by personnel wearing clean and unused vinyl or nitrile gloves and directly installed. In the event that visual inspection indicates torn packaging or the potential for contamination of well materials, a power washer or high pressure steam cleaner should be used to clean the material prior to assembly and installation. All wells consisting of Type 304 stainless steel should be cleaned with a high pressure steam cleaner prior to assembly and installation.

4.6 Interface Probe and Water Level Indicator

The entire length of the probe and tape that was inserted into the well will be decontaminated by washing with a non-phosphate detergent (e.g., *Liquinox*™) and then rinsing with potable water.

5.0 Documentation

The procedure(s) employed, date(s), and time(s) will be recorded on the appropriate documentation (e.g., daily field reports, field notebooks, boring logs, etc.). Deviations must be approved by the Project Manager and/or Quality Assurance Officer and documented in the field notebook or field logs.

6.0 Special Notes

None

HULL & ASSOCIATES, INC.
STANDARD OPERATING PROCEDURE

Title: Packaging and Shipping of Non-Hazardous Samples	
Effective Date: 11/6/13	**Document Number: HULLSOP.F1013.R0**
Author	
Name: Monica Williamson Title: Sr. Scientist Signature:	Date: 11/6/13
Approvals	
Name: Ray Kennedy Title: Sr. Project Manager Signature:	Date: 11/6/13

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F1013-01REV – created in 2001; superceded in September 2012.	2001 (month not recorded)

HULLSOP.F1013.R0
PACKAGING AND SHIPPING OF NON-HAZARDOUS SAMPLES

1.0 Purpose

The purpose of Hull & Associates, Inc. (Hull) Standard Operating Procedure (SOP) is to describe the procedures that shall be used to package and ship all non-hazardous samples. These procedures are the recommended handling procedures for all sample shipments to minimize the loss of samples associated with breakage and/or being received above the method required temperature. These requirements are mandatory for all samples being transported by project personnel. Project personnel include all Hull employees as well as personnel directly employed by the analytical subcontractor. Third-party courier services, regardless of whether contracted internally or by the analytical laboratory, are always considered non-project personnel. Strict adherence to these procedures shall help ensure sample integrity even if delivery is delayed.

2.0 Equipment and Materials

- cooler or other appropriate shipping container;
- duct tape;
- clear packing tape;
- custody seals;
- sealable bags, various sizes;
- packing material (styrofoam peanuts, bubble wrap, etc.); and
- mailing label (in addition to any shipping papers).

3.0 Procedures

The following procedures shall be adhered to for packaging and shipping of all non-hazardous samples. The procedures for packaging and shipping of samples in this SOP should not be used if any materials to be shipped are known or suspected to be hazardous or flammable.

A. Coolers

Coolers are the most common package or containment device used to ship samples. Coolers are also used during sampling efforts to store and transport samples prior to shipping. It is very important that samples be placed in an iced cooler immediately after collection. The ice in the cooler used for shipping will last much longer if the sample containers placed into it have been pre-chilled. The following procedures shall be used when packing the cooler for shipment:

1. Secure the drain on the cooler with packing tape or duct tape to prevent accidental opening.

2. Place each individual sample (soil and/or groundwater) in a *sealable* bag. VOA vials that are aliquots from the same sample can be placed in the same bag. It is recommended that the VOA vials be wrapped with bubble wrap or paper towel to prevent excessive contact during shipping.

3. Select an appropriate cooler size to allow for upright storage of sample containers. Situate the sample containers so that they do not touch each other.

4. Use plastic bubble wrap or styrofoam peanuts as packing or filler material to prevent the samples from colliding and breaking during transportation. Place layers of bubble wrap on the bottom of the cooler. Do not use shredded paper because if the paper becomes wet it will no longer be useful to prevent samples from colliding. Only a minimum amount of packing material should be used as these materials insulate the samples and prevent them from being properly chilled. Plastic sample containers can be placed between glass containers. Bags of ice may be also be used as packaging material between samples. Sample containers should be snug and not easily moved within the cooler.

5. Fill the cooler with ice. EPA protocols do not allow the use of icepacks or ice substitutes (blue ice) because they are unable to maintain a sufficiently cold temperature. Ice must be double-bagged in sealable bags. Forty to fifty percent of the cooler capacity should contain ice in order to keep the samples cold during transport. Sufficient ice should be placed with the samples in the shipping container to ensure that ice is still present when the samples arrive at the laboratory. If a commercial carrier such as FedEx or UPS is shipping the samples it is best to use more ice in case delivery is delayed. Less ice may be used if the samples will be delivered by hand. As a rule of thumb, an average cooler with a capacity of approximately 48 quarts will require two to three eight-pound bags of ice.

6. Temperature blanks shall be placed at the top of the cooler directly under the ice.

7. Chain-of-custody (COC) records shall be completed as described by HULLSOP.F3014.R0 (or current version). Place the COC record in a sealable bag and tape the bag to the underside of the cooler lid. If samples are packed in multiple coolers, the number of coolers should be marked on the COC record and a photocopy of the COC shall be placed in each cooler.

8. Tape the cooler shut to prevent accidental opening or potential leakage. Tape shall be placed around the entire perimeter of the lid and then around the body of cooler in two or three places. Do not tape down or otherwise restrict access to the cooler handles. Coolers used for shipping should not have any broken or missing handles.

9. Custody seals shall then be placed on the cooler to document the integrity of the shipping container. A minimum of two custody seals shall be placed on each cooler in a manner that the cooler cannot be opened without breaking the seal. Each custody seal shall be signed and dated by the person packing the cooler and the seals shall covered by clear packing tape to prevent accidental loss or damage during shipping. Duct tape may be used as a custody seal, but should be signed and dated by the person packing the cooler.

10. Affix a mailing label with the laboratory's address on the cooler. Apply clear tape over the address label to prevent accidental loss or damage during shipping. This label is required in addition to any shipping papers required by carriers.

B. Boxes

Some samples do not require temperature control and may be shipped in boxes. The boxes should be sturdy enough to withstand rough handling. No liquids shall ever be shipped by box. Materials suitable to be shipped by box include:

1. Air samples in summa canisters or airtight gas sampling bags or other non-pressurized sample containers.

2. Bulk asbestos samples.

3. Soil samples for geotechnical analyses.

These materials may be securely packed in a suitable box. The box shall be sealed with packing tape and affixed with address labels and custody seals as described above.

4.0 Documentation

A copy of any applicable shipping papers shall be retained for future reference. Any pertinent shipping information should be recorded on the Daily Field Report or in the field notebook for the project.

5.0 Special Notes

None

6.0 Applicable Standards or References

Hull & Associates, Inc. Standard Operating Procedure No. HULLSOP.F3014.R0 or current version (Chain-of-Custody Procedures).

HULL & ASSOCIATES, INC.
STANDARD OPERATING PROCEDURE

Title: Chain-of-Custody Procedures – Environmental Samples	
Effective Date: 11/4/13	**Document Number: HULLSOP.F3014.R0**
Author	
Name: Monica Williamson Title: Sr. Scientist Signature:	Date: 11/4/13
Approvals	
Name: Ray Kennedy Title: Sr. Project Manager Signature:	Date: 11/4/13

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F3014-12REV – created in 2012; superceded in September 2013.	2012 (month not recorded)
F3014-02REV – created in 2002; superceded in 2012.	2002 (month not recorded)

HULLSOP.F3014.R0
CHAIN-OF-CUSTODY PROCEDURES
ENVIRONMENTAL SAMPLES

1.0 Purpose

This Hull & Associates, Inc. (Hull) Standard Operating Procedure (SOP) documents the chain-of-custody (COC) procedures that will be employed during all environmental sampling activities.

2.0 Equipment and Materials

- Indelible ink ball-point pens
- Chain-of-custody records
- One-gallon size *Zip-Loc* (or equivalent) storage bags

3.0 General

A completed COC record must accompany every sample from the point of collection to delivery to the laboratory. A single COC record may accompany several samples as long as all the samples are contained in a single unit (e.g., cooler, box, etc.). If a single COC is to be used for multiple samples in multiple coolers, then a photocopy of the original COC must be placed in each cooler. All COCs will be kept in one-gallon *Zip-Loc* bags, or equivalent to prevent damage from melting ice, broken samples, and bad weather. A copy of every completed COC record will be retained in the project files.

4.0 Procedures

4.1 Completion of COC Record

A. The COC record is initiated in the field by the sampler(s) immediately after a sample is collected. Figure F3014-1 illustrates a properly completed COC.

B. The sample identification number will be recorded on the COC. Each sample number consist of three distinct data fields. These data fields include; Project Number, Sample Location, and Sample Type. A space for each data field is provided on the COC.

C. The number of containers that makes a complete sample will be recorded in the box labeled "No. of Containers." A sample may consist of multiple containers depending upon the analytical procedures requested.

D. If the sample is to be analyzed for metals, the box labeled "Metals" shall be completed to indicate whether the sample fractions for metals have been filtered. A "F" will be used to indicate that the metals were filtered and a "N" will indicate that they were not filtered. Occasionally, some samples may require metal fractions to be filtered and not filtered (e.g., analyses for dissolved and total metals). In this case,

"B" will be used to indicate that the sample contains both filtered and non-filtered fractions. If the sample does not require analyses for metals a single line will be drawn through this box.

E. The date and time (military) of sample collection will be recorded in the box labeled "Sampling Date/Time." It is very important to note the time each sample was collected even if samples are collected a few minutes apart.

F. The requested analytical methods will be recorded in the diagonal spaces provided under the box labeled "Analyses." The preservatives added to the containers for each analytical method will be indicated by recording the letter in the box labeled "Preservatives" that corresponds to the preservative added. The preservatives and corresponding letters are listed near the top of the COC record. Finally, a check mark(s) will be made under each analysis for which a particular sample will be analyzed.

G. Any comments relating to the collected sample(s) can be recorded in the box labeled "Comments." These comments may indicate special handling or analytical instructions for the laboratory (e.g., compositing instructions, confirm MTBE, etc.) or may be used to indicate the location of sample collection.

H. Additional information required on the COC record includes the person the analytical reports should be sent to, client, site, project description, project number, names of all samplers involved in sample collection, where the samples are to be delivered, method of delivery, and airbill number (if applicable).

I. In certain instances when a Hull COC is not available, it may be necessary to use a laboratory-supplied COC. The laboratory-supplied COC should contain the information outlined in Section 4.1; A through H.

4.2 Transfer of Custody

A. The COC record must document the transfer of custody each time the sample(s) changes hands. The National Enforcement Investigations Center (NEIC) of the United States Environmental Protection Agency (EPA) defines custody as:

1. the sample is in your physical possession;

2. the sample is within view after being in your physical possession;

3. the sample was in your possession and then you locked it or sealed it to prevent tampering; and/or

4. the sample is placed in a designated secure place with limited access to authorized personnel only.

B. When transferring custody of samples, the person in custody (e.g., the sampler) must sign the box labeled "Relinquished By" and fill in the date and time (military time) the custody of the samples was relinquished. The person accepting

custody of the samples must then sign the box labeled "Received By" and complete the date and time (military time) the custody of the samples was accepted.

C. The above procedures must be followed until the samples are delivered to the laboratory. Both internal (within the same organization) and external (between different organizations) transfers need to be documented. In cases where a commercial courier (e.g., Federal Express) is used to deliver the samples, the person relinquishing custody to the courier should put the name of the courier in the "Received By" box and seal the COC inside the cooler. Most couriers have a policy against signing for custody of samples.

D. The pink copy (bottom) of the COC will be retained by the sampler before the samples are shipped and the remaining copies (white and yellow) of the COC are delivered to the laboratory. The pink copy will then be immediately given to the Project Manager or Quality Assurance Officer (QAO). The white copy will be returned by the laboratory with the final report.

5.0 Documentation

Chain-of-custody record

6.0 Special Notes

If samples are shipped via commercial courier on Friday the air bill needs to be checked for Saturday delivery and appropriate “Saturday Delivery” stickers (provided by the courier company) must be affixed to the container.

If samples are known to contain flammable or hazardous materials they need to be shipped accordingly. Check with the courier for specific shipping, labeling and packing requirements.

7.0 Applicable Standards and References

U.S. Environmental Protection Agency. NEIC Policies and Procedures. EPA-330/9-78-001-R. May 1978. (Revised February 1983.)

U.S. Environmental Protection Agency. User's Guide to the Contract Laboratory Program. Office of Emergency and Remedial Response. December 1986.

U.S. Environmental Protection Agency. A Compendium of Superfund Field Operations Methods. EPA/540/P-87/001, December 1987.

FIGURE

FIGURE 3014-1

Hull & associates, inc.

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

NO. 8323

Dublin, OH ☒
6397 Emerald Pkwy
Suite 200
Dublin, OH 43016
P: (614) 793-8777
F: (614) 793-9070

Indianapolis, IN ☐
6435 Castleway W. Dr.
Suite 119
Indianapolis, IN 46250
P: (800) 241-7173
F: (614) 793-9070

Mason, OH ☐
4770 Duke Dr.
Suite 300
Mason, OH 45040
P: (513) 459-9677
F: (513) 459-9869

Bedford, OH ☐
4 Hemisphere Way
Bedford, OH 44146
P: (440) 232-9945
F: (440) 232-9946

Toledo, OH ☐
3401 Glendale Ave.
Suite 300
Toledo, OH 43614
P: (419) 385-2018
F: (419) 385-5487

Pittsburgh, PA ☐
300 Business Center Dr.
Suite 320
Pittsburgh, PA 15205
P: (412) 446-0315
F: (412) 446-0324

REPORT TO: K. WILDMAN

Client: ABC COMPANY
Site: ANYTOWN, USA
Project #: ABC001 Phase: 01.SMP
Samplers: J. SMALL, T. LARGE

SAMPLE TYPES	PRESERVATIVES		METALS
A - AIR	A - Cool only, <4 deg. C	H - EDTA	F - Filtered
C - ASBESTOS	B - HNO_3 pH<2	I - 5ml 1:1 HCL	N - Not filtered
D - SEDIMENT	C - H_2SO_4 pH<2	J - None	B - Both
G - GROUNDWATER	D - NaOH pH>12	K - Stored in dark	
P - PRODUCT	E - ZnAcetate + NaOH, pH>9	L - NH_4Cl	
S - SOIL	F - $Na_2S_2O_3$ (0.008%)	M - Methanol	
W - WATER	G - HCL pH <2	S - Sodium bisulfate	
Z - OTHERS			

All samples are kept at 4 degrees Celsius.

PROJECT NO.	SAMPLE LOCATION	SAMPLE TYPE & ID	NO. OF CONT.	METALS	COLLECTION DATE/TIME	ANALYSES: PRESERVATIVES	A	A	G	B	COMMENTS
							VOCs - 8260	PAHs - 8310	VOCs - 8260	RCRA METALS	
ABC001	MW-1	S020030	2	—	11/14/13 0905		X	X			
ABC001	MW-2	S030035	2	—	11/14/13 1013		X	X			(HOLD SAMPLE)
ABC001	MW-3	S080100	2	—	11/14/13 1315		X	X			
ABC001	MW-1	G111413	3	F	11/14/13 1528			X	X		
ABC001	FB-1	W111413	2	—	11/14/13 1530			X			
ABC001	TB-1	W111413	2	—	11/14/13 —			X			
					/						
					/						
					/						
					/						
					/						
					/						

RELINQUISHED BY: J. SMALL	DATE: 11/14/13 TIME: 1705	RECEIVED BY: FEDEX	DATE: 11/14/13 TIME: 1705
RELINQUISHED BY:	DATE: TIME:	RECEIVED BY:	DATE: TIME:
RELINQUISHED BY:	DATE: TIME:	RECEIVED FOR LAB BY:	DATE: TIME:

COOLER TEMPERATURE AS RECEIVED: °C

DISTRIBUTION:
WHITE - LAB USE (MUST BE RETURNED WITH REPORT)
YELLOW - LAB USE
PINK - RETAINED BY HULL

Deliver To: SOME LABORATORY, INC.
Method of Delivery: FEDEX
Airbill Number: WZ9832109X
NOTES: VAP PROJECT

TURN AROUND TIME: 14 DAYS

HULL & ASSOCIATES, INC.
STANDARD OPERATING PROCEDURE

Title: Surface and Subsurface Sediment Sampling	
Effective Date: 9/10/13	**Document Number: HULLSOP.F3027.R0**
Author	
Name: Tracy Edwards Title: Sr. Project Manager  Signature:	Date: 9/10/13
Approvals	
Name: Bill Dennis (on behalf of Dave Mustafaga – Division Leader) Title: Sr. Project Manager  Signature:	Date: 9/10/13

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F3027-12REV – created to update both F3021-00REV and F3027-08REV; superceded in September 2013	2012 (month not recorded)
F3027-08REV – created in 2008, superceded in 2012 by F3027-12REV	2008 (month not recorded)
F3021-00REV – created in 2000, superceded in 2008 by F3027-08REV	2000 (month not recorded)

HULLSOP.F3027.R0
SURFACE AND SUBSURFACE SEDIMENT SAMPLING

1.0 Purpose

This document describes the general and specific procedures that will be followed and identifies special considerations when collecting surface or shallow subsurface sediment samples.

For the purpose of this Standard Operating Procedure (SOP), surface sediments are those found in the upper 0-16 cm (0-7 inches). Subsurface deposits are those found at greater depths. The sampler will consult the project documents to determine the appropriate sampling depths.

2.0 SOP Specific Terminology

Sediment – unconsolidated inorganic and organic materials that are suspended in and being transported by surface water or has settled out and deposited under surface waters which include 1) materials below bankfull elevation in streams, rivers, or ditches and below the ordinary high water mark of lakes or ponds; 2) materials within the federal jurisdictional boundaries of wetlands; 3) materials at and below the maximum capacity for ponds and lagoons and 4) deposits along and adjacent to surface water bodies that were deposited under historic submerged conditions.

Surface Sample – samples collected from within the top seven inches of the sediment deposits.

Subsurface Sample – samples collected from depths greater than seven inches from the top of the sediment column.

Submerged – found beneath the surface of standing water.

Dry sediments – sediments where the void spaces are filled with air**.**

Saturated sediments – sediments where the void spaces are all filled with water**.**

Dredge – A device that is dragged across the sediment interface collecting a composite of surface sediment and benthic fauna.

Core – A column of undisturbed sediment from which depth-discrete samples can be collected.

Grab – A single, discrete sample collected from one location at one point in time.

Composite – A thoroughly homogenized set of two or more grab samples.

Left Bank –The left bank of a river when facing up downstream.

Right Bank – The right bank of a river when facing downstream.

Winch - A stationary motor-driven or hand-powered machine used for hoisting or hauling, having a drum around which is wound a rope or chain attached to the load being moved.

3.0 Sample Types

There are three main types of sediment sampling: grab, core and dredge. The type of sample to be collected is determined by the intent of the testing (i.e. spatial sampling, sediment accumulation profiles, chemical analyses, grain size analyses, etc.) and characteristics of the study area such as the depth of water, depth of sediment, and the strength of the current.

Grab sediment samples are most commonly used to collect surface sediment where the intent is to characterize the horizontal heterogeneity of surface sediment. The easiest method for collecting grab samples is to use a spoon or trowel; however, this method produces limited volume of sediment and the collection depth often cannot be accurately determined. Dredges may be used when larger volumes of sediment are required and are typically used in deep open waters; however this method provides limited control of the sample location, depth, and volume, and causes disruption of the sediment and pore water integrity (EPA, 2001) and loss of the fine grained sediment fraction. Dredge samplers are typically deployed for benthos studies. Core samplers are used in thick sediment deposits or for the collection of sediment profiles to determine the vertical distribution of sediment characteristics. Core samples are recommended when the data quality objectives of the investigation require accurate sediment sampling depths, when vertical profiles are needed to assess the quality of sediments at depth, or when it is important to maintain sampled sediments in an oxygen-free environment for intended analytical testing.

4.0 Special Considerations

Sediment characteristics quality can vary substantially horizontally and vertically depending upon flow rates and depositional history. It is critical that the sediment samples be collected from the sample horizon(s) identified in the work plan. Sampling procedures will vary depending upon whether the sediment deposits are submerged or not, and how deep the water is at the sampling locations. Ideally, an initial bathymetric survey will guide the choice of sampling technique at various locations.

If sampling locations have not been pre-determined by requirement of the Site-specific work plan or sampling plan, the field team will be required to select the sampling locations. The sampling sequence should commence from the furthest downstream sampling point location, proceeding up-stream. Samplers should face upstream when collecting the samples. If surface water samples are to be collected in addition to the sediment, the water samples will be collected first.

5.0 Health and Safety

The buddy system is required for all sediment sampling programs that are implemented in settings where there is standing or flowing water. The sampling crew is required to wear life vests at all times near the water; a safety line will be required where there is fast moving water, water is present at depths greater than three feet and there is the potential for unstable footing.

Where use of a boat is required to obtain sediment samples, appropriate Health & Safety directives applicable to watercraft must be observed.

6.0 Equipment and Materials

Refer to Table 1 for additional information on specific sampling devices.

- Laboratory supplied sampling containers; EnCore Samplers or equivalent if testing for volatile organic compounds (VOCs);
- Nitrile and/or latex sampling gloves;
- Sampling flags;
- Garbage bags;
- Permanent marking pen;
- Hack saw;
- Electrical tape;
- Global positioning system (GPS) receiver;
- Life vests and safety lines;
- Flat bottom boat (if applicable);
- Waders;
- Spade/shovel and stainless steel (SS) or *Teflon* trowel/scoop (for shallow wadable water sample collection);
- Slide hammer (fence post driver) for driving sediment column samplers;
- Bucket auger or tube auger (shallow wadable water);
- Extendable T- handle;
- Ekman or Ponar dredge or similar (lakes and ponds);
- 2" or 3" O.D. polycarbonate (e.g., Lexan) tubing;
- 2" or 3" I.D. polycarbonate (e.g., Lexan) tubing;
- Drop hammer (fencepost hammer);
- Polycarbonate adhesive (*Rez-n-Bond*™);
- Core sampler (AMS, split spoon, polyvinyl chloride (PVC) or similar piping);
- Core sleeves (PVC, mylar, brass liners, Shelby tubes, or similar);
- Decontamination equipment and supplies; and
- Nylon rope or steel cable for safety line and dredge retrieval.

7.0 Procedures

7.1 Sampling dry or saturated non-submerged sediment

Under these conditions, a spoon/trowel or hand-driven core sampler is used to obtain samples.

Discrete Grab Samples

A. All sampling equipment will be decontaminated prior to use in accordance with the procedures specified in the current Hull SOP for equipment decontamination.

B. If a shallow subsurface sample is desired, the trowel or spade will be used to remove the top layer of sediment to the desired sample depth.

C. A sampling device (e.g., spoon) will be used to remove the sample from the sediment on the blade of the trowel or spade, avoiding the thin layer of sediment from the area which comes in direct contact with the trowel or spade.

D. The sample will be placed into an appropriate sample container supplied by the laboratory.

E. The sample container will be labeled with the appropriate information. All chain-of-custody documents will be completed and the appropriate information recorded in the field log book or report form (see current Hull Chain-of-Custody SOP).

F. The labeled sample container will be placed in an appropriate transport container with ice (if required) as soon as possible.

G. All sampling equipment will be decontaminated between sample locations in accordance with the procedures specified in the current Hull SOP for equipment decontamination.

Core Samples

Core sampling in dry or saturated non-submerged sediment can be completed using push tubes, gravity corers, or sand pounders. Procedures for core sampling are described under Section 7.2 below.

Composite Samples

Discrete samples that comprise a composite sample will be collected as described above; however, a stainless steel mixing bowl or *Teflon* tray will be used for mixing the discrete samples prior to placing the sample in the laboratory-supplied sample containers. Composite sampling is generally not recommended when samples are to be analyzed for VOCs (see the current Hull SOP for Soil Sampling Procedures for EPA Method SW-846 5035).

7.2 Sampling submerged sediment

In very shallow water (e.g., less than one foot), it may be possible to obtain surface or shallow subsurface sediment samples with a spoon as described in section 7.1 above. In deeper water, surface sediment grab samples (top one to two inches) of soft sediment may be obtained with a dredge-type sampler (e.g., Eckmann, Ponar, or other equivalent device) if there is no leaf litter layer or other obstructions. Where samples must be obtained from sediments deeper than one to two inches, where surface litter or sediment density precludes efficient dredge operation, or where the target sediment includes a large proportion of fine grained material, core sampling must be conducted. Core sampling can consist of push tubes, hand driven corers (such as the AMS sediment corer) or in deeper non-wadeable water, gravity corers or vibrating coring devices may be used.

Grab Sampling using a Dredge

A. All sampling equipment will be decontaminated prior to use in accordance with the procedures specified in the current Hull SOP for equipment decontamination.

B. The appropriate length of suitable suspension cord will be attached to the decontaminated sampler. A 3/16-inch diameter braided line will normally provide sufficient strength; however, a 3/8-inch diameter line will allow easier hand-hoisting.

C. The distance beneath the surface to the sample location will be marked on the sample line. A second mark will be identified on the sample line that is approximately one meter less to indicate proximity to the sample depth. This will identify the depth where the lowering rate will be reduced to minimize unnecessary disturbance of the sludges or sediments. If sampling relatively shallow streams, it is not necessary to mark the line because the sampler will be lowered very slowly until the bottom is contacted.

D. The free end of sample line will be tied to a fixed support to prevent the accidental loss of the sampler. Allow sufficient slack in the line to perform sampling activities.

E. The sampler jaws will be opened until they latch. From this point on, the sampler will be supported by its sample line only or the sampler may be tripped and the jaws will close prematurely.

F. The sampler will be slowly lowered until the proximity mark (the first mark encountered) is reached or the bottom is contacted.

G. The rate of descent will be slowed through the last meter of fall until contact with the bottom is observed.

H. The sample line will be allowed to go slack several inches. In strong currents, more slack may be necessary to release the mechanism. In shallow streams, the top of the clamshells may be gently pushed with a probe to allow the clamshells to sink deeper into the sediments and maximize recovery.

I. The sampler will be raised clear of the water surface.

J. The sampler will be placed into a stainless steel or *Teflon* tray and opened. The sampler will be lifted clear of the tray.

K. The sample will be collected with a sampling device (e.g., spoon) and placed into an appropriate sample container.

L. The sample container will be labeled with the appropriate information. All chain-of-custody documents will be completed and the appropriate information recorded in the field log book or report form.

M. The labeled sample container will be placed in an appropriate transport container on ice (if required) as soon as possible.

N. All sampling equipment will be decontaminated in accordance with the procedures specified in the current Hull SOP for equipment decontamination.

Sampling With a Push-Tube Core Sampler

The following procedures are applicable to push tube-type coring devices. Please refer to the Work Plan/Field Sampling and Analysis Plan and manufacturers' instructions for specific coring devices.

A. Obtain clear polycarbonate (e.g., Lexan) tubing of sufficient diameter and size for sampling effort. Two-inch OD (outside diameter) cores are sufficient for most chemical analytical sampling, while three-inch OD cores may be needed for geotechnical analysis.

B. The length of tubing obtained should take into account both the depth of the planned sediment core and the depth of any standing water under which the sediment core is to be taken. Polycarbonate tubing is typically available in eight foot lengths. Tubing sections can be joined together to reach depths greater than eight feet. A section of polycarbonate tubing with an inside diameter matching the OD of the sample tubing will be obtained and cut into four to six inch collar lengths to fit over and join sections of the sample tubing. A polycarbonate adhesive such as *Rez-n-Bond*™ is then used in the field to glue the collar to each joined section of the sampling tube.

C. The tubing is advanced throughout the water column and into the sediment using a fence post hammer (drop hammer). The sample tubing will be advanced to the desired depth or until refusal is encountered. Ideally, the tubing will be advanced six inches past the desired maximum depth of the sample to allow for some loss of sediments out the end of the sampler. Once the tubing has been driven, the section of tubing remaining above the level of the surface water will be filled with water so that the tubing is completely full of water. The tubing will then be sealed with a plastic cap. Electrical tape will be used to make sure that the cap is securely fastened to the tubing. After the tubing has been capped, it can then be removed by hand. When extracting the tubing, care should be taken to pull the tubing straight up and the cores need to remain vertical. Once the tubing has been fully extracted, the bottom of the tubing will then be capped similar to the top.

D. The sample cores will then be prepared by removing the section of tubing full of water that is above the sediment. At a point at least six inches above the top of the surface of the collected sediments, a hack-saw cut should be made until the wall of the tube is just breached and the standing water in the tube can be slowly drained by gravity. If the cut is made too low or is too big, the top of the sediment core may be disturbed by the turbulence created by a rapid outflow of water. Care should be taken so that the draining water is directed away from the samplers and any surfaces (boat) that may be become slippery when wet.

E. Once the water is drained (except for the first six inches on top of the core), tubing is cut the rest of the way through at the drain saw cut mark above the core, and the core is then re-capped.

F. The intact core can be visually inspected for stratigraphy. The desired depth intervals of sample core may be sectioned off by cutting the interval out of the core with a hack saw. These subsections may then be recapped or the sediments may be extracted and placed in other containers. If the samples are to be submitted for chemical analyses, the hack saw blade must be decontaminated between cuts in accordance with the current Hull SOP for equipment decontamination.

G. If the sediment samples are to be submitted for chemical analyses but will not be immediately subdivided, the cores should be stored on ice in a large garbage can or other suitable container until they are processed as described above.

Sampling with Gravity Corer

A. Decontaminate portions of the sampling equipment that will make contact with the sample in accordance with the current Hull SOP for equipment decontamination.

B. Place the sample sleeve/liner inside the sampler body.

C. Insert the sediment catcher into the lower end of the sampling tube with the convex surface positioned inside the sample sleeve.

D. Screw the nosecone onto the lower end of the sampling tube, securing the acetate sleeve and egg-shell check valve. Screw the bracket to the top of the sampling tube.

E. Place the core catcher (typically stainless steel) at the tip of the sampler.

F. Thread the nose cone onto the sampler.

G. Add additional weight disks if needed.

H. Attach deployment cable line to the top of the main body of the sampler and secure the line at the surface.

I. Deploy the sampler by lowering the sampler body into the water using the cable line as fast as possible.

J. Allow the sampler to free fall into the sediment column. The gravity corer may be modified to attach a slide-hammer mechanism if needed to drive the sampler deeper into the sediment column.

K. Record the length of the tube that penetrated the sediment.

L. Extract the tube from the sediment and carefully remove the coring device from the water. A slide hammer may be attached to the coring apparatus and used to extract the corer from the sediment column by sharply pulling up on the hammer.

M. Unscrew the nosecone and remove the core catcher.

N. Slide the acetate sleeve out of the sampler tube. Decant surface water, using care to retain the fine sediment fraction. The sample may be used in this fashion, or the contents transferred to a sample or homogenization container.

O. If head space is present in the upper end, a hacksaw may be used to shear the acetate tube off at the sediment surface. The acetate core may then be capped at both ends. Indicate on the acetate tube the appropriate orientation of the sediment core using a waterproof marker.

P. The sediment may be extracted from the acetate sleeve and manipulated in the typical fashion. Extrude the sample from or open the acetate tube and transfer the sediment to an appropriate homogenization or sample container. Ensure that non-dedicated containers have been adequately decontaminated.

Sampling with Sand Pounder (such as Ogeechee Sand Pounder)

A. Decontaminate portions of the sampling equipment that will make contact with the sample in accordance with the current Hull SOP for equipment decontamination.

B. Place the sample liner inside the core barrel.

C. Place the core catcher (typically stainless) at the tip of the sampler.

D. Thread the nose cone onto the sampler.

E. Secure the deployment cable at the surface for retrieval assistance.

F. Connect the extension handle to the sampler body.

G. Deploy the sampler through the water column and obtain the sample by exerting downward pressure while twisting on the handle or if needed, attach the optional drive hammer to the assembly.

H. Drive sampler by manually raising and lowering the hammer to drive the sampler into the sediment column.

I. Sharply pull the drive hammer upwards and dislodge the sampler from the sediment. Slowly withdraw the sampler from the sediment; use of a winch may be necessary in fine grained deposits.

J. Carefully remove the coring device from the water.

K. Unscrew the nosecone and remove the core catcher.

L. Slide the acetate sleeve out of the sampler tube. Decant surface water, using care to retain the fine sediment fraction. The sample may be used in this fashion, or the contents transferred to a sample or homogenization container.

M. If head space is present in the upper end, a hacksaw may be used to shear the acetate tube off at the sediment surface. The acetate core may then be capped at both ends. Indicate on the acetate tube the appropriate orientation of the sediment core using a waterproof marker.

N. The sediment may be extracted from the acetate sleeve and manipulated in the typical fashion. Extrude the sample from or open the acetate tube and transfer the sediment to an appropriate homogenization or sample container. Ensure that non-dedicated containers have been adequately decontaminated.

Core Sampling with Motor Assembly (such as Vibracore)

A. Attach a tether to the core barrel.

B. Attach the vibrator head near the top of the unsharpened end of the core barrel prior to initiating the coring procedure.

C. Vertically position the core barrel at the sampling location and allow it to sink under its own weight.

D. Rapidly advance the core barrel by initiating the vibrator head engine.

E. Pull downward on the tether to assist penetration through resistant surfaces.

F. Remove the vibrator head.

G. Measure the distance to the sediment surface both inside and outside the pipe to determine the amount of compaction.

H. Cut the pipe approximately 2 feet above the ground surface (if working in wetland area) or water surface (if working in deeper water) with a hacksaw.

I. Fill the pipe with water and seal the end to prevent loss of sediment from the core pipe once it is retrieved.

J. Assemble a tripod over the intruded pipe.

K. Fasten two come-alongs the eyeloops on the tripod head and to a rope securely fastened to the core pipe.

L. Extract the sample core barrel.

M. When the core is completely out of the sediment, remove the come-alongs.

N. Open the core pipe slot by pulling on the cord that moves the spring-loaded slot gate.

O. Gently place the core barrel horizontally to prevent disturbance of the core and examined.

Sample Extraction, Preparation and Sampling from Core Barrels

The following general sample collection procedures are applicable to all coring devices. Equipment-specific procedures will be used where / when applicable.

Extraction

A. Remove the sediment samples from the core either by splitting the core lengthwise and removing the selected sample or by drilling holes in the core liner.

B. Splitting the core lengthwise is preferred since it allows direct observation of the sediment structure, bedding, lithologies and other features. Samples can be collected from one half of the core and the other half can be preserved for future studies or sampling.

C. A power drill fitted with a 1.5- to 2-inch saw can be used to make holes in the liner to remove the samples with a spoon. The core sleeve plug can be replaced with duct tape or electrical tape. Spacing of approximately 1 foot is recommended to ensure that the samples are representative of the lithologies in the cores.

Sample Selection from Core Sampler

Discrete Samples

A. Samples recovered from the first depth interval (zero to seven inches) may be obtained with a stainless steel spoon if water depth allows. The sample will be placed in a properly labeled laboratory container. The labeling must include the date of collection, project no., sample location, sample number, sampling depth interval, and sampler's ID number.

B. All depth intervals will be sampled with the appropriate core sampling device. The sample will then be transferred to the sample containers by pouring the sediments into the appropriate containers. If it is not possible to pour the sediments, a clean stainless steel spoon or spatula may be used to facilitate the transfer.

C. Sampling equipment shall be decontaminated between sample intervals, as well as between sampling locations, in accordance with the current Hull SOP for equipment decontamination.

Composite Samples

Composite samples are typically comprised of samples from equivalent sediment depths at multiple locations.

A. Composite samples, consisting of a pre-determined number of discrete samples, may be recovered using the soil recovery probe. Dedicated plastic sampling sleeves will be used for these composite samples. The probe will be driven to an appropriate depth, and a sample recovered from the appropriate depth at each sampling location. The equal volume samples will then be composited by mixing in a stainless steel pan and then placed in a properly labeled laboratory container. The sampling equipment shall be decontaminated between sampling zones in accordance with the current Hull SOP for equipment decontamination (i.e., between areas represented by a composite sample).

B. Where exact mapping of sample locations is required, the discrete sample locations shall be marked in such a way that they can be properly mapped.

8.0 Documentation

Each sample container will be labeled as directed by the Project Work Plan or by the Project Manager and a chain-of-custody record will be completed. A field log book or other Field Data Sheet will be kept describing the sampling procedures, the sample locations, all sample identification numbers, and any deviations from this SOP. A map or site sketch will be constructed of all sample locations using field measurements, GPS coordinates, or from coordinates obtained from a qualified surveyor. If necessary, an elevation of the sample location will be obtained and referenced to an appropriate benchmark.

9.0 Special Notes

The decontamination process will be repeated after each use and between all discrete sample locations. If compositing strategies are used, decontamination may only be required between composite samples (i.e., not between discrete samples that form a single composite). Sample gloves shall be changed in between each location.

10.0 Applicable Standards and References

Ohio Environmental Protection Agency. Sediment Sampling Guide and Methodologies, 2nd Addition. November 2001.

Tetra Tech EM, Inc for U.S. EPA (National Exposure Research Laboratory, Environmental Science Division) Literature Review and Report Surface Sediment Sampling Technologies. July 24, 2003.

U.S. EPA. Characterization of Hazardous Waste Sites, A Methods Manual - Vol. II, Available Sampling Methods. 2nd Ed. 12/84. EPA/600/4-84/076.

U.S. EPA Region IV, Sediment Sampling SOP. September 2010. SESDPROC-200-R2.

HULLSOP.F3027.R0
TABLE 1
SUMMARY OF COMMON SEDIMENT SAMPLING EQUIPMENT

TYPE	MODEL	DESCRIPTION	PENETRATION DEPTH	WATER CURRENT APPLICATION	SAMPLE LOCATION	SUBSTRATE TYPE	REMARKS
GRAB	Inert Scoop or Spoon (stainless steel, Teflon, etc.)	Stainless steel or Teflon hand tools	Typically up to 1 ft in combination with using a spade.	None to Slight	Dry Saturated Submerged	All	- Use only in calm, shallow water - Relatively little sample disturbance - Simple and inexpensive - Fines may be washed out when retrieved through water column
GRAB	Eckman -Birge	Box-style sediment sampler including a messenger operated release device; overlapping cover plates, loosely hinged at the top of the box; permits an outflow of water during descent and closes tightly to prevent wash out of sediment during ascent.	4.5-13.5 in.	None to Very Slight	Submerged	Fine Grained Sediment (silt and clay)	- Use only in calm, shallow water - Relatively little sample disturbance - Excellent Jaw Shape and Cut - Pebbles or branches may interfere with jaw closure - Poor stability. Light weight allows for the device to "swim" in a current which can cause mis-triggers. - 0.02 m^2 sample area - Sample Weight is 10 kg (22 lb.)
GRAB / DREDGE	Petite Ponar Peterson	Claw-type sampler designed for penetrating deep into the substrate; used in fresh and salt waters to collect samples of hard sediments such as sand, gravel or clay.	4.5 in.	None to Very Slight	Submerged	Clay to Fine Gravel	- Use only in calm, sheltered water - Good Stability - Less sample wash-out if used with extra weight - Relatively little sample disturbance - Requires a winch - 0.1 to 0.2 m^2 sample area - Weight with Sample is 30-50 kg (66-110 lb.)
GRAB	Shipek	Center pivot sampler designed to collect unconsolidated sediments from deep lakes and near off-shore.	4.5 in.	None to Strong	Submerged	Clay to Gravel	- Use requires a boat/barge with winch (mini-Shipek can be used manually) - Most reliable in terms of triggering, stability, washout and leaching. - Excellent Jaw Shape and Cut - Clean cutting action - 0.04 m^2 sample area - Weight with Sample 60-70 kg (132-154 lb.) - Weight with Sample of Mini Shipek is 20-30 kg (44-66 lb.)

TABLE 1
SUMMARY OF COMMON SEDIMENT SAMPLING EQUIPMENT

TYPE	MODEL	DESCRIPTION	PENETRATION DEPTH	WATER CURRENT APPLICATION	SAMPLE LOCATION	SUBSTRATE TYPE	REMARKS
CORE	BOX	Large sampler usually deployed in large lakes or open ocean for the collection of relatively undisturbed samples; sampler requires deployment with a winch and the depth of the sample is dependent upon the substrate and the speed at which the sampler is deployed onto the floor.		None to Strong	Submerged	Clay to Sand	- Difficult to handle - Large Sample Volume - Use requires a boat/barge with winch
CORE	Manually Driven Corers Core Tubes/Push Tubes, AMS, Russian, Ogeechee	Manually driven devices with or without core liners which can be bottom or side filling samplers; can be fitted with extension handles and slide hammers for advancing the sampler.	1-9 ft.	None to Strong	Dry Saturated Submerged	Clay to Sand Inserts needed for sandy deposits	- Recommended for shallow water - Samples may compress - Deployed by hand or driver (slide hammer) - Extension handles can be used in deeper waters
CORE	Piston	Stainless steel frame with internal core tube, nose piece and core retainers; sampler exerts pressure to allow for greater sample retension.	6-60 ft.	None to Moderate	Dry Saturated Submerged	Clay to Sand Inserts needed for sandy deposits	- Recommended for shallow water - Vertical profile remains intact and visible - Point design can reduce sample compaction - Stone can interfere with sample collection - Deploy by hand or by driver (slide hammer) - Equipment is heavy

TABLE 1
SUMMARY OF COMMON SEDIMENT SAMPLING EQUIPMENT

TYPE	MODEL	DESCRIPTION	PENETRATION DEPTH	WATER CURRENT APPLICATION	SAMPLE LOCATION	SUBSTRATE TYPE	REMARKS
CORE	Gravity (KB Corer)	Stainless steel frame fitted with fins and an internal core tube, nose piece and core retainers; the fins stabilize the sampler as it is allowed to free fall and penetrate the sediments under it own weight.	3 ft.	None to Moderate	Saturated Submerged	Fine Sediment Silt and Clay	- Recommended for rivers - Recommended for depth up to 10 meters (~33 feet) - Point design can reduce sample compaction - Stone can interfere with sample collection - Deploy by hand or by driver (slide hammer) - Equipment is heavy
CORE	Phleger	Stainless steel sampler consisting of a weighted hollow tube that is used to penetrate the bottom sediment layers so the vertical deposition of sediments can be studied.	22 in.	None to Moderate	Saturated Submerged	Fine Sediment Silt	- Quick and easy - Recommended for short cores in soft sediment - Relatively undisturbed samples - Small sample volume - Sampler generally deployed from a boat - Equipment is heavy
CORE	Vibracore	Stainless steel sampler designed to collect sediment samples from lakes, bays, and estuaries; constructed of stainless steel; can be powered by portable generators.	6-39 ft.	None to Moderate	Saturated Submerged	Fine Sediment Silt	- Relatively quick and easy - Recommended for short cores in soft sediment - Relatively undisturbed samples - Small sample volume - Sampler generally deployed from a boat - Equipment is heavy

Adapted from Tetra Tech EM, Inc. Literature Review and Report of Surface-Sediment Sampling Technologies, 2003; and Ohio EPA's Sediment Sampling Guide and Methodologies, 2001.

ATTACHMENT D

Field Forms

HULL

GEOTECHNICAL/MATERIALS TESTING LABORATORY
CHAIN OF CUSTODY RECORD

Report To:	**Date Due:**
Client*:	
Site*:	
Project Name*:	
Project Number*:	
Sampler(s):	

Silt/Clay Micron Break:
□ 2µm □ 5µm

*Write information exactly as it will be shown on final soils report

SAMPLE TYPE:
J - JAR
B - BUCKET
ST - SHELBY TUBE
BAG - BAG
L - LINERS
RC - Rock Core Box

HULL Lab # (assigned by lab)	Sample Date	Location	Sample No.	Depth	Sample Type	Moisture Content (D2216)	Atterberg Limits (D4318)	Hydrometer/Sieve (D422)	Complete USCS Classifacation	Specific Gravity (D854)	Proctor (STD / Modified)			

Comments:

Relinquished By:	Date:		Recieved By:	Date:
	Time:			Time:
Relinquished By:	Date:		Recieved By:	Date:
	Time:			Time:
Relinquished By:	Date:		Received By Lab:	Date:
	Time:			Time:

☐ CHECKED BY: □ APPROVED BY: □ BILLED BY:

4 Hemisphere Way
Bedford, OH 44146
440.232.9945

HULL

GEOTECHNICAL/MATERIALS TESTING LABORATORY
CHAIN OF CUSTODY RECORD

Client*:

Site*:

Project Name*:

Project Number*:

Sampler(s):

**Write information exactly as it will be shown on final soils report*

SAMPLE TYPE:
J - JAR
B - BUCKET
ST - SHELBY TUBE
BAG - BAG
L - LINERS
RC - Rock Core Box

HULL Lab # (assigned by lab)	Sample Date	Location	Sample No.	Depth	Sample Type	Moisture Content (D2216)	Atterberg Limits (D4318)	Hydrometer/Sieve (D422)	Complete USCS Classifcation	Specific Gravity (D854)	Proctor (STD / Modified)			

4 Hemisphere Way
Bedford, OH 44146
440.232.9945

HULL & ASSOCIATES, INC. **TEST PIT FIELD LOG**

LOCATION OF TEST PIT: 			PROJ NO:				LOCATION:			
			CLIENT:							
			PROJECT:					TEST PIT NO:		
			EQUIPMENT TYPE:					PAGE		
WEATHER:			SAMPLING METHOD:					OF		
CONTRACTOR:			WATER LEVEL FROM:				START/FINISH			
LOGGED BY:		DATE:	TIME:				TIME:	TIME:		
CHECKED BY:		DATE:	DATE:				DATE:	DATE:		
DATUM:		ELEVATION:	DEPTH:							

SMPL. No./DEPTH			DEPTH IN FEET	SAMPLE	SOIL GRAPH	NOTES (SURFACE CONDITION, LAB SOIL SAMPLE NUMBERS, SOIL DRUMS, ETC.):
			1			
			2			
			3			
			4			
			5			
			6			
			7			
			8			
			9			
			10			
			11			
			12			
			13			
			14			
			15			
			16			
			17			
			18			
			19			
			20			

TEST PIT COMPLETION		
MATERIAL:		
SURFACE MATERIAL:		
SEDDING:		

HULL & ASSOCIATES, INC. **SOIL BORING / MONITORING WELL FIELD LOG**

LOCATION OF BORING:

PROJ No: | CLIENT: | LOCATION:

PROJECT:

DRILLING METHOD: | SB/MW No:

SAMPLING METHOD:

FID MODEL,CALIB.,BACKGR: | SHEET

WEATHER: | PID MODEL: | PID CALIBRATION: | 1 OF

CONTRACTOR: | WATER LEVEL FROM: | DRILLING START/FINISH

LOGGED BY: | DATE: | TIME: | TIME: | TIME:

CHECKED BY: | DATE: | DATE: | DATE: | DATE:

DATUM: | ELEVATION: | DEPTH: | AIR MONITORING

SAMPLER TYPE	DRV./REC.	SMPL. No./DEPTH	BLOW COUNTS	PID/FID (ppm)	DEPTH IN FEET	SAMPLE	SOIL GRAPH	WELL	NOTES (SURFACE CONDITION, LAB SOIL SAMPLE NUMBERS, SOIL DRUMS, ETC.):	TIME	FID	LEL
					1							
					2							
					3							
					4							
					5							
					6							
					7							
					8							
					9							
					10							
					11							
					12							
					13							
					14							
					15							
					16							
					17							
					18							
					19							
					20							

MONITORING WELL CONSTRUCTION	CONCRETE SEAL:	SOIL BORING COMPLETION
SURFACE PROTECTOR:	GROUT:	MATERIAL:
RISER:	BENTONITE SEAL:	SURFACE MATERIAL:
SCREEN:	SAND PACK:	

SAMPLES SENT TO LABORATORY:

APPENDIX B

Chemical Laboratory Reports

21-Apr-2016

Matt Beil
Hull & Associates, Inc.
3401 Glendale Ave
Suite 300
Toledo, OH 43614

Re: **RCK001 - Lagoon D** Work Order: **1604561**

Dear Matt,

ALS Environmental received 3 samples on 12-Apr-2016 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with Ohio VAP standard requirements and QC results achieved laboratory specifications in accordance with VAP approved SOPs and the ALS Quality Assurance Manual. Any exceptions are noted in the Case Narrative, with qualifiers in the report , with QC batch information, and/or are identified on the certified laboratory affidavit. Should this laboratory report need to be reproduced, it shall be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless additional storage arrangements are made.

The total number of pages in this report is 91.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Certificate No: MN 998501

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

ALS Group USA, Corp

Date: 21-Apr-16

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Work Order: **1604561**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1604561-01	RCK001:D-2: S000130	Soil	D-2	4/9/2016 16:30	4/12/2016 09:30	☐
1604561-02	RCK001:D-3: S000090	Soil	D-3	4/9/2016 16:30	4/12/2016 09:30	☐
1604561-03	RCK001:FB-1: W041116	Water	FB-1	4/11/2016 09:00	4/12/2016 09:30	☐

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and PQL, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
µg/L	Micrograms per Liter
mg NH3-N/L	Milligrams Ammonia-Nitrogen per Liter
mg/Kg-dry	Milligrams per Kilogram Dry Weight
mg/L	Milligrams per Liter
s.u.	Standard Units

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Work Order: 1604561

Case Narrative

Samples for the above noted Work Order were received on 4/12/2016. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

With the following exceptions, all sample analyses achieved analytical criteria.

Volatile Organics:
Batch 84608, Method VOC_8260_S, Sample LCS-84608: The LCS recovery was above the upper control limit. All the sample results in the batch were non-detect. No qualification is necessary for this analyte. Bromomethane

Extractable Organics:
Batch 84712, Method PEST_8081A_OVAP_S, Sample 1604561-02C MSD: RPD's exceeded control chart criteria, however recoveries in the Matrix Spike and the Matrix Spike Duplicate met acceptance criteria.

Batch 84712, Method PEST_8081A_OVAP_S, Sample PLCSS1-84712: The LCS recovery was above the upper control limit. All the sample results in the batch were non-detect. No qualification is necessary for this analyte. Endrin

Metals:
No other deviations or anomalies were noted.

Wet Chemistry:
Batch 84716, Method PO4_4500E_S, Sample 1604561-01C MS: The MS recovery was below the lower control limit. The corresponding result in the parent sample may be biased low for this analyte.

Batch 84716, Method PO4_4500E_S, Sample 1604561-01C MSD: The MSD recovery was below the lower control limit. The corresponding result in the parent sample may be biased low for this analyte.

Batch 84717, Method PASC_365.1_S, Sample 1604561-01C MS: The MS recovery was outside of the control limit; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte.

Batch 84717, Method PASC_365.1_S, Sample 1604561-01C MSD: The MSD recovery was outside of the control limit; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte.

Batch 84831, Method BOD_5210B_S, Sample 1604561-01C: Sample holding time expired before receipt by laboratory.

Batch 84831, Method BOD_5210B_S, Sample 1604561-02C: Sample holding time expired before receipt by laboratory.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:D-2: S000130
Collection Date: 4/9/2016 04:30 PM

Work Order: 1604561
Lab ID: 1604561-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 4/14/16		Analyst: **EB**
Aroclor 1016	U		39	330	µg/Kg-dry	1	4/15/2016 03:09
Aroclor 1221	U		39	330	µg/Kg-dry	1	4/15/2016 03:09
Aroclor 1232	U		39	330	µg/Kg-dry	1	4/15/2016 03:09
Aroclor 1242	U		39	330	µg/Kg-dry	1	4/15/2016 03:09
Aroclor 1248	U		39	330	µg/Kg-dry	1	4/15/2016 03:09
Aroclor 1254	**710**		**49**	**330**	**µg/Kg-dry**	1	4/15/2016 03:09
Aroclor 1260	U		49	330	µg/Kg-dry	1	4/15/2016 03:09
Surr: Decachlorobiphenyl	*89.1*			*40-140*	*%REC*	1	4/15/2016 03:09
Surr: Tetrachloro-m-xylene	*91.1*			*45-124*	*%REC*	1	4/15/2016 03:09
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 4/14/16		Analyst: **BLM**
4,4´-DDD	U		11	79	µg/Kg-dry	2	4/14/2016 20:18
4,4´-DDE	U		17	79	µg/Kg-dry	2	4/14/2016 20:18
4,4´-DDT	U		14	79	µg/Kg-dry	2	4/14/2016 20:18
Aldrin	U		12	79	µg/Kg-dry	2	4/14/2016 20:18
alpha-BHC	U		8.3	79	µg/Kg-dry	2	4/14/2016 20:18
alpha-Chlordane	U		13	79	µg/Kg-dry	2	4/14/2016 20:18
beta-BHC	U		28	79	µg/Kg-dry	2	4/14/2016 20:18
Chlordane, Technical	U		58	200	µg/Kg-dry	2	4/14/2016 20:18
delta-BHC	U		12	79	µg/Kg-dry	2	4/14/2016 20:18
Dieldrin	U		17	79	µg/Kg-dry	2	4/14/2016 20:18
Endosulfan I	U		10	79	µg/Kg-dry	2	4/14/2016 20:18
Endosulfan II	U		18	79	µg/Kg-dry	2	4/14/2016 20:18
Endosulfan sulfate	U		14	79	µg/Kg-dry	2	4/14/2016 20:18
Endrin	U		13	79	µg/Kg-dry	2	4/14/2016 20:18
Endrin aldehyde	U		32	79	µg/Kg-dry	2	4/14/2016 20:18
gamma-BHC (Lindane)	U		11	79	µg/Kg-dry	2	4/14/2016 20:18
Heptachlor	U		12	79	µg/Kg-dry	2	4/14/2016 20:18
Heptachlor epoxide	U		11	79	µg/Kg-dry	2	4/14/2016 20:18
Toxaphene	U		59	480	µg/Kg-dry	2	4/14/2016 20:18
Surr: Decachlorobiphenyl	*120*			*45-135*	*%REC*	2	4/14/2016 20:18
Surr: Tetrachloro-m-xylene	*96.1*			*45-124*	*%REC*	2	4/14/2016 20:18
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 4/15/16		Analyst: **LR**
Mercury	**0.018**	J	**0.0038**	**0.045**	**mg/Kg-dry**	1	4/18/2016 10:27
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 4/20/16		Analyst: **RH**
Magnesium	**19,000**		**11**	**370**	**mg/Kg-dry**	10	4/15/2016 20:32
Potassium	**400**		**65**	**370**	**mg/Kg-dry**	10	4/15/2016 20:32
Sodium	**400**		**38**	**370**	**mg/Kg-dry**	10	4/15/2016 20:32

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:D-2: S000130
Collection Date: 4/9/2016 04:30 PM

Work Order: 1604561
Lab ID: 1604561-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 4/15/16		Analyst: **RH**
Antimony	U		0.11	9.4	mg/Kg-dry	10	4/15/2016 20:32
Arsenic	U		1.5	9.4	mg/Kg-dry	10	4/15/2016 20:32
Beryllium	**0.23**	J	**0.15**	**3.7**	**mg/Kg-dry**	10	4/15/2016 20:32
Cadmium	**0.26**	J	**0.15**	**3.7**	**mg/Kg-dry**	10	4/15/2016 20:32
Chromium	**2.9**	J	**1.5**	**9.4**	**mg/Kg-dry**	10	4/15/2016 20:32
Copper	**6.1**	J	**0.49**	**9.4**	**mg/Kg-dry**	10	4/15/2016 20:32
Lead	**3.1**	J	**0.22**	**9.4**	**mg/Kg-dry**	10	4/15/2016 20:32
Nickel	**9.3**	J	**1.6**	**9.4**	**mg/Kg-dry**	10	4/15/2016 20:32
Selenium	U		1.5	9.4	mg/Kg-dry	10	4/15/2016 20:32
Silver	U		0.26	9.4	mg/Kg-dry	10	4/15/2016 20:32
Thallium	**0.43**	J	**0.26**	**9.4**	**mg/Kg-dry**	10	4/15/2016 20:32
Zinc	**16**	J	**3.7**	**19**	**mg/Kg-dry**	10	4/15/2016 20:32
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 4/13/16		Analyst: **RM**
1,2-Diphenylhydrazine	U		31	380	µg/Kg-dry	1	4/14/2016 02:30
2,4,6-Trichlorophenol	U		74	380	µg/Kg-dry	1	4/14/2016 02:30
2,4-Dichlorophenol	U		77	380	µg/Kg-dry	1	4/14/2016 02:30
2,4-Dimethylphenol	U		90	380	µg/Kg-dry	1	4/14/2016 02:30
2,4-Dinitrophenol	U		110	380	µg/Kg-dry	1	4/14/2016 02:30
2,4-Dinitrotoluene	U		55	380	µg/Kg-dry	1	4/14/2016 02:30
2,6-Dinitrotoluene	U		79	380	µg/Kg-dry	1	4/14/2016 02:30
2-Chloronaphthalene	U		21	76	µg/Kg-dry	1	4/14/2016 02:30
2-Chlorophenol	U		67	380	µg/Kg-dry	1	4/14/2016 02:30
2-Nitrophenol	U		99	380	µg/Kg-dry	1	4/14/2016 02:30
3,3´-Dichlorobenzidine	U		480	1,900	µg/Kg-dry	1	4/14/2016 02:30
4,6-Dinitro-2-methylphenol	U		54	380	µg/Kg-dry	1	4/14/2016 02:30
4-Bromophenyl phenyl ether	U		55	380	µg/Kg-dry	1	4/14/2016 02:30
4-Chloro-3-methylphenol	U		55	380	µg/Kg-dry	1	4/14/2016 02:30
4-Chlorophenyl phenyl ether	U		67	380	µg/Kg-dry	1	4/14/2016 02:30
4-Nitrophenol	U		58	380	µg/Kg-dry	1	4/14/2016 02:30
Acenaphthene	U		28	76	µg/Kg-dry	1	4/14/2016 02:30
Acenaphthylene	U		23	76	µg/Kg-dry	1	4/14/2016 02:30
Anthracene	U		37	76	µg/Kg-dry	1	4/14/2016 02:30
Benzidine	U		390	1,900	µg/Kg-dry	1	4/14/2016 02:30
Benzo(a)anthracene	U		46	76	µg/Kg-dry	1	4/14/2016 02:30
Benzo(a)pyrene	U		16	76	µg/Kg-dry	1	4/14/2016 02:30
Benzo(b)fluoranthene	U		26	76	µg/Kg-dry	1	4/14/2016 02:30
Benzo(g,h,i)perylene	U		33	76	µg/Kg-dry	1	4/14/2016 02:30
Benzo(k)fluoranthene	U		47	76	µg/Kg-dry	1	4/14/2016 02:30

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:D-2: S000130
Collection Date: 4/9/2016 04:30 PM

Work Order: 1604561
Lab ID: 1604561-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		38	380	µg/Kg-dry	1	4/14/2016 02:30
Bis(2-chloroethyl)ether	U		42	380	µg/Kg-dry	1	4/14/2016 02:30
Bis(2-chloroisopropyl)ether	U		190	380	µg/Kg-dry	1	4/14/2016 02:30
Bis(2-ethylhexyl)phthalate	U		120	380	µg/Kg-dry	1	4/14/2016 02:30
Butyl benzyl phthalate	U		110	380	µg/Kg-dry	1	4/14/2016 02:30
Chrysene	U		64	76	µg/Kg-dry	1	4/14/2016 02:30
Dibenzo(a,h)anthracene	U		25	76	µg/Kg-dry	1	4/14/2016 02:30
Diethyl phthalate	U		48	380	µg/Kg-dry	1	4/14/2016 02:30
Dimethyl phthalate	U		38	380	µg/Kg-dry	1	4/14/2016 02:30
Di-n-butyl phthalate	U		100	380	µg/Kg-dry	1	4/14/2016 02:30
Di-n-octyl phthalate	U		99	380	µg/Kg-dry	1	4/14/2016 02:30
Fluoranthene	**49**	J	**47**	**76**	**µg/Kg-dry**	1	4/14/2016 02:30
Fluorene	U		42	76	µg/Kg-dry	1	4/14/2016 02:30
Hexachlorobenzene	U		61	380	µg/Kg-dry	1	4/14/2016 02:30
Hexachlorobutadiene	U		68	380	µg/Kg-dry	1	4/14/2016 02:30
Hexachlorocyclopentadiene	U		93	380	µg/Kg-dry	1	4/14/2016 02:30
Hexachloroethane	U		160	380	µg/Kg-dry	1	4/14/2016 02:30
Indeno(1,2,3-cd)pyrene	U		47	76	µg/Kg-dry	1	4/14/2016 02:30
Isophorone	U		68	1,900	µg/Kg-dry	1	4/14/2016 02:30
Naphthalene	U		20	76	µg/Kg-dry	1	4/14/2016 02:30
Nitrobenzene	U		83	1,900	µg/Kg-dry	1	4/14/2016 02:30
N-Nitrosodimethylamine	U		340	1,900	µg/Kg-dry	1	4/14/2016 02:30
N-Nitrosodi-n-propylamine	U		75	380	µg/Kg-dry	1	4/14/2016 02:30
N-Nitrosodiphenylamine	U		57	380	µg/Kg-dry	1	4/14/2016 02:30
Pentachlorophenol	U		130	380	µg/Kg-dry	1	4/14/2016 02:30
Phenanthrene	**45**	J	**42**	**76**	**µg/Kg-dry**	1	4/14/2016 02:30
Phenol	U		76	380	µg/Kg-dry	1	4/14/2016 02:30
Pyrene	U		57	76	µg/Kg-dry	1	4/14/2016 02:30
Surr: 2,4,6-Tribromophenol	*95.9*			*34-140*	*%REC*	1	4/14/2016 02:30
Surr: 2-Fluorobiphenyl	*80.9*			*12-100*	*%REC*	1	4/14/2016 02:30
Surr: 2-Fluorophenol	*85.0*			*33-117*	*%REC*	1	4/14/2016 02:30
Surr: 4-Terphenyl-d14	*82.0*			*25-137*	*%REC*	1	4/14/2016 02:30
Surr: Nitrobenzene-d5	*88.5*			*37-107*	*%REC*	1	4/14/2016 02:30
Surr: Phenol-d6	*78.5*			*40-106*	*%REC*	1	4/14/2016 02:30
VOLATILE ORGANICS - METHANOL CORRECTED		Method: **SW8260B**			Prep: SW5035 / 4/12/16		Analyst: **BG**
1,1,1-Trichloroethane	U		40	140	µg/Kg-dry	1	4/13/2016 21:30
1,1,2,2-Tetrachloroethane	U		34	140	µg/Kg-dry	1	4/13/2016 21:30
1,1,2-Trichloroethane	U		42	140	µg/Kg-dry	1	4/13/2016 21:30
1,1-Dichloroethane	U		36	140	µg/Kg-dry	1	4/13/2016 21:30

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:D-2: S000130
Collection Date: 4/9/2016 04:30 PM

Work Order: 1604561
Lab ID: 1604561-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		38	140	µg/Kg-dry	1	4/13/2016 21:30
1,2-Dichlorobenzene	U		42	140	µg/Kg-dry	1	4/13/2016 21:30
1,2-Dichloroethane	U		38	140	µg/Kg-dry	1	4/13/2016 21:30
1,2-Dichloropropane	U		39	140	µg/Kg-dry	1	4/13/2016 21:30
1,3-Dichlorobenzene	U		45	140	µg/Kg-dry	1	4/13/2016 21:30
1,4-Dichlorobenzene	U		37	140	µg/Kg-dry	1	4/13/2016 21:30
Acrolein	U		430	940	µg/Kg-dry	1	4/13/2016 21:30
Acrylonitrile	U		120	470	µg/Kg-dry	1	4/13/2016 21:30
Benzene	U		32	140	µg/Kg-dry	1	4/13/2016 21:30
Bromodichloromethane	U		38	140	µg/Kg-dry	1	4/13/2016 21:30
Bromoform	U		50	140	µg/Kg-dry	1	4/13/2016 21:30
Bromomethane	U		61	350	µg/Kg-dry	1	4/13/2016 21:30
Carbon tetrachloride	U		25	140	µg/Kg-dry	1	4/13/2016 21:30
Chlorobenzene	U		42	140	µg/Kg-dry	1	4/13/2016 21:30
Chloroethane	U		90	470	µg/Kg-dry	1	4/13/2016 21:30
Chloroform	U		48	140	µg/Kg-dry	1	4/13/2016 21:30
Chloromethane	U		57	470	µg/Kg-dry	1	4/13/2016 21:30
cis-1,2-Dichloroethene	U		40	140	µg/Kg-dry	1	4/13/2016 21:30
cis-1,3-Dichloropropene	U		54	140	µg/Kg-dry	1	4/13/2016 21:30
Dibromochloromethane	U		32	140	µg/Kg-dry	1	4/13/2016 21:30
Ethylbenzene	U		33	140	µg/Kg-dry	1	4/13/2016 21:30
Methylene chloride	U		65	140	µg/Kg-dry	1	4/13/2016 21:30
Tetrachloroethene	U		70	140	µg/Kg-dry	1	4/13/2016 21:30
Toluene	U		47	140	µg/Kg-dry	1	4/13/2016 21:30
trans-1,2-Dichloroethene	U		40	140	µg/Kg-dry	1	4/13/2016 21:30
trans-1,3-Dichloropropene	U		25	140	µg/Kg-dry	1	4/13/2016 21:30
Trichloroethene	U		38	140	µg/Kg-dry	1	4/13/2016 21:30
Vinyl chloride	U		45	140	µg/Kg-dry	1	4/13/2016 21:30
Surr: 1,2-Dichloroethane-d4	*92.0*			*70-130*	*%REC*	1	4/13/2016 21:30
Surr: 4-Bromofluorobenzene	*93.2*			*70-130*	*%REC*	1	4/13/2016 21:30
Surr: Dibromofluoromethane	*90.3*			*70-130*	*%REC*	1	4/13/2016 21:30
Surr: Toluene-d8	*96.0*			*70-130*	*%REC*	1	4/13/2016 21:30
BIOCHEMICAL OXYGEN DEMAND		Method:	**A5210B-97**		Prep: A5210B / 4/12/16		Analyst: **TVD**
Biochemical Oxygen Demand	U	H	28	28	mg/Kg-dry	1	4/17/2016 11:30
CHLORIDE		Method:	**A4500-CL E-97**		Prep: EXTRACT / 4/18/16		Analyst: **ED**
Chloride	**59**		**3.1**	**28**	**mg/Kg-dry**	1	4/19/2016 12:50
CYANIDE, TOTAL		Method:	**SW9012B**		Prep: SW9012B / 4/14/16		Analyst: **JB**
Cyanide, Total	**0.11**	J	**0.031**	**1.4**	**mg/Kg-dry**	1	4/14/2016 09:54

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:D-2: S000130
Collection Date: 4/9/2016 04:30 PM

Work Order: 1604561
Lab ID: 1604561-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND			Method: **E410.4 R2.0**		Prep: EXTRACT / 4/15/16		Analyst: **JJG**
Chemical Oxygen Demand	**430**	J	**240**	**1,300**	**mg/Kg-dry**	1	4/19/2016 09:55
MOISTURE			Method: **SW3550C**				Analyst: **ED**
Moisture	**65**		**0.025**	**0.050**	**% of sample**	1	4/12/2016 16:48
NITROGEN, TOTAL			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total	**310**		**0**	**2.8**	**mg/Kg-dry**	1	4/18/2016 07:50
AMMONIA AS NITROGEN			Method: **A4500-NH3 G-97**		Prep: A4500-NH3 B / 4/14/16		Analyst: **JJG**
Ammonia as Nitrogen	**57**		**8.8**	**30**	**mg NH3-N/Kg-dry**	1	4/15/2016 10:19
NITROGEN, NITRITE			Method: **A4500-NO2 B**		Prep: EXTRACT / 4/13/16		Analyst: **JB**
Nitrogen, Nitrite	**0.023**	J	**0.021**	**1.8**	**mg/Kg-dry**	1	4/13/2016 14:00
NITROGEN, NITRATE			Method: **E353.2**		Prep: EXTRACT / 4/13/16		Analyst: **JJG**
Nitrogen, Nitrate	U		0.13	2.6	mg/Kg-dry	1	4/13/2016 11:59
NITROGEN, NITRATE-NITRITE			Method: **E353.2**		Prep: EXTRACT / 4/13/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	U		0.20	2.6	mg/Kg-dry	1	4/13/2016 11:59
NITROGEN, TOTAL INORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Inorganic	**56**		**0**	**0.056**	**mg/Kg-dry**	1	4/18/2016 07:50
NITROGEN, TOTAL ORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Organic	**250**		**2.8**	**2.8**	**mg/Kg-dry**	1	4/18/2016 07:50
PHOSPHORUS, TOTAL			Method: **E365.1 R2.0**		Prep: E365.1 R2.0 / 4/14/16		Analyst: **JJG**
Phosphorus, Total	**1,500**		**270**	**1,100**	**mg/Kg-dry**	50	4/14/2016 11:38
PH			Method: **SW9045D**		Prep: EXTRACT / 4/12/16		Analyst: **STP**
pH	**9.3**		**0**		**s.u.**	1	4/12/2016 16:00
PHOSPHORUS, ORTHO-P (AS P)			Method: **A4500-P E-97**		Prep: E365.1 R2.0 / 4/14/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**30**		**1.2**	**2.6**	**mg/Kg-dry**	1	4/14/2016 13:21
NITROGEN, TOTAL KJELDAHL			Method: **A4500-NH3 G-97**		Prep: A4500-N B / 4/12/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**300**		**9.8**	**21**	**mg/Kg-dry**	1	4/13/2016 09:41
ORGANIC CARBON - WALKLEY-BLACK			Method: **TITRAMETRIC**				Analyst: **KF**
Organic Carbon - W-B	**0.77**		**0.034**	**0.070**	**% by wt-dry**	1	4/13/2016 10:20

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:D-3: S000090
Collection Date: 4/9/2016 04:30 PM

Work Order: 1604561
Lab ID: 1604561-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 4/14/16		Analyst: **EB**
Aroclor 1016	U		27	230	µg/Kg-dry	1	4/15/2016 03:25
Aroclor 1221	U		27	230	µg/Kg-dry	1	4/15/2016 03:25
Aroclor 1232	U		27	230	µg/Kg-dry	1	4/15/2016 03:25
Aroclor 1242	U		27	230	µg/Kg-dry	1	4/15/2016 03:25
Aroclor 1248	U		27	230	µg/Kg-dry	1	4/15/2016 03:25
Aroclor 1254	U		34	230	µg/Kg-dry	1	4/15/2016 03:25
Aroclor 1260	U		34	230	µg/Kg-dry	1	4/15/2016 03:25
Surr: Decachlorobiphenyl	*87.1*			*40-140*	*%REC*	1	4/15/2016 03:25
Surr: Tetrachloro-m-xylene	*83.1*			*45-124*	*%REC*	1	4/15/2016 03:25
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 4/14/16		Analyst: **BLM**
4,4´-DDD	U		7.4	55	µg/Kg-dry	2	4/14/2016 20:34
4,4´-DDE	U		12	55	µg/Kg-dry	2	4/14/2016 20:34
4,4´-DDT	U		10	55	µg/Kg-dry	2	4/14/2016 20:34
Aldrin	U		8.7	55	µg/Kg-dry	2	4/14/2016 20:34
alpha-BHC	U		5.8	55	µg/Kg-dry	2	4/14/2016 20:34
alpha-Chlordane	U		9.4	55	µg/Kg-dry	2	4/14/2016 20:34
beta-BHC	U		20	55	µg/Kg-dry	2	4/14/2016 20:34
Chlordane, Technical	U		41	140	µg/Kg-dry	2	4/14/2016 20:34
delta-BHC	U		8.7	55	µg/Kg-dry	2	4/14/2016 20:34
Dieldrin	U		12	55	µg/Kg-dry	2	4/14/2016 20:34
Endosulfan I	U		7.3	55	µg/Kg-dry	2	4/14/2016 20:34
Endosulfan II	U		12	55	µg/Kg-dry	2	4/14/2016 20:34
Endosulfan sulfate	U		9.9	55	µg/Kg-dry	2	4/14/2016 20:34
Endrin	U		9.4	55	µg/Kg-dry	2	4/14/2016 20:34
Endrin aldehyde	U		22	55	µg/Kg-dry	2	4/14/2016 20:34
gamma-BHC (Lindane)	U		7.8	55	µg/Kg-dry	2	4/14/2016 20:34
Heptachlor	U		8.7	55	µg/Kg-dry	2	4/14/2016 20:34
Heptachlor epoxide	U		7.8	55	µg/Kg-dry	2	4/14/2016 20:34
Toxaphene	U		41	330	µg/Kg-dry	2	4/14/2016 20:34
Surr: Decachlorobiphenyl	*116*			*45-135*	*%REC*	2	4/14/2016 20:34
Surr: Tetrachloro-m-xylene	*76.1*			*45-124*	*%REC*	2	4/14/2016 20:34
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 4/15/16		Analyst: **LR**
Mercury	**0.0087**	J	**0.0032**	**0.037**	**mg/Kg-dry**	1	4/18/2016 10:29
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 4/20/16		Analyst: **RH**
Magnesium	**15,000**		**13**	**450**	**mg/Kg-dry**	10	4/15/2016 20:39
Potassium	**360**	J	**78**	**450**	**mg/Kg-dry**	10	4/15/2016 20:39
Sodium	**340**	J	**45**	**450**	**mg/Kg-dry**	10	4/15/2016 20:39

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:D-3: S000090
Collection Date: 4/9/2016 04:30 PM

Work Order: 1604561
Lab ID: 1604561-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 4/15/16		Analyst: **RH**
Antimony	U		0.13	11	mg/Kg-dry	10	4/15/2016 20:39
Arsenic	U		1.7	11	mg/Kg-dry	10	4/15/2016 20:39
Beryllium	U		0.18	4.5	mg/Kg-dry	10	4/15/2016 20:39
Cadmium	U		0.18	4.5	mg/Kg-dry	10	4/15/2016 20:39
Chromium	**2.6**	J	**1.8**	**11**	**mg/Kg-dry**	10	4/15/2016 20:39
Copper	**4.9**	J	**0.58**	**11**	**mg/Kg-dry**	10	4/15/2016 20:39
Lead	**2.2**	J	**0.27**	**11**	**mg/Kg-dry**	10	4/15/2016 20:39
Nickel	**7.8**	J	**1.9**	**11**	**mg/Kg-dry**	10	4/15/2016 20:39
Selenium	**1.9**	J	**1.7**	**11**	**mg/Kg-dry**	10	4/15/2016 20:39
Silver	U		0.31	11	mg/Kg-dry	10	4/15/2016 20:39
Thallium	U		0.31	11	mg/Kg-dry	10	4/15/2016 20:39
Zinc	**21**	J	**4.5**	**22**	**mg/Kg-dry**	10	4/15/2016 20:39
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 4/13/16		Analyst: **RM**
1,2-Diphenylhydrazine	U		20	230	µg/Kg-dry	1	4/14/2016 02:50
2,4,6-Trichlorophenol	U		46	230	µg/Kg-dry	1	4/14/2016 02:50
2,4-Dichlorophenol	U		48	230	µg/Kg-dry	1	4/14/2016 02:50
2,4-Dimethylphenol	U		56	230	µg/Kg-dry	1	4/14/2016 02:50
2,4-Dinitrophenol	U		71	230	µg/Kg-dry	1	4/14/2016 02:50
2,4-Dinitrotoluene	U		35	230	µg/Kg-dry	1	4/14/2016 02:50
2,6-Dinitrotoluene	U		49	230	µg/Kg-dry	1	4/14/2016 02:50
2-Chloronaphthalene	U		13	47	µg/Kg-dry	1	4/14/2016 02:50
2-Chlorophenol	U		42	230	µg/Kg-dry	1	4/14/2016 02:50
2-Nitrophenol	U		62	230	µg/Kg-dry	1	4/14/2016 02:50
3,3´-Dichlorobenzidine	U		300	1,200	µg/Kg-dry	1	4/14/2016 02:50
4,6-Dinitro-2-methylphenol	U		34	230	µg/Kg-dry	1	4/14/2016 02:50
4-Bromophenyl phenyl ether	U		35	230	µg/Kg-dry	1	4/14/2016 02:50
4-Chloro-3-methylphenol	U		35	230	µg/Kg-dry	1	4/14/2016 02:50
4-Chlorophenyl phenyl ether	U		42	230	µg/Kg-dry	1	4/14/2016 02:50
4-Nitrophenol	U		36	230	µg/Kg-dry	1	4/14/2016 02:50
Acenaphthene	U		18	47	µg/Kg-dry	1	4/14/2016 02:50
Acenaphthylene	U		15	47	µg/Kg-dry	1	4/14/2016 02:50
Anthracene	U		23	47	µg/Kg-dry	1	4/14/2016 02:50
Benzidine	U		240	1,200	µg/Kg-dry	1	4/14/2016 02:50
Benzo(a)anthracene	U		29	47	µg/Kg-dry	1	4/14/2016 02:50
Benzo(a)pyrene	U		10	47	µg/Kg-dry	1	4/14/2016 02:50
Benzo(b)fluoranthene	U		16	47	µg/Kg-dry	1	4/14/2016 02:50
Benzo(g,h,i)perylene	U		21	47	µg/Kg-dry	1	4/14/2016 02:50
Benzo(k)fluoranthene	U		30	47	µg/Kg-dry	1	4/14/2016 02:50

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:D-3: S000090
Collection Date: 4/9/2016 04:30 PM

Work Order: 1604561
Lab ID: 1604561-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		24	230	µg/Kg-dry	1	4/14/2016 02:50
Bis(2-chloroethyl)ether	U		26	230	µg/Kg-dry	1	4/14/2016 02:50
Bis(2-chloroisopropyl)ether	U		120	230	µg/Kg-dry	1	4/14/2016 02:50
Bis(2-ethylhexyl)phthalate	U		74	230	µg/Kg-dry	1	4/14/2016 02:50
Butyl benzyl phthalate	U		66	230	µg/Kg-dry	1	4/14/2016 02:50
Chrysene	U		40	47	µg/Kg-dry	1	4/14/2016 02:50
Dibenzo(a,h)anthracene	U		15	47	µg/Kg-dry	1	4/14/2016 02:50
Diethyl phthalate	U		30	230	µg/Kg-dry	1	4/14/2016 02:50
Dimethyl phthalate	U		23	230	µg/Kg-dry	1	4/14/2016 02:50
Di-n-butyl phthalate	U		64	230	µg/Kg-dry	1	4/14/2016 02:50
Di-n-octyl phthalate	U		62	230	µg/Kg-dry	1	4/14/2016 02:50
Fluoranthene	U		29	47	µg/Kg-dry	1	4/14/2016 02:50
Fluorene	U		26	47	µg/Kg-dry	1	4/14/2016 02:50
Hexachlorobenzene	U		38	230	µg/Kg-dry	1	4/14/2016 02:50
Hexachlorobutadiene	U		43	230	µg/Kg-dry	1	4/14/2016 02:50
Hexachlorocyclopentadiene	U		58	230	µg/Kg-dry	1	4/14/2016 02:50
Hexachloroethane	U		100	230	µg/Kg-dry	1	4/14/2016 02:50
Indeno(1,2,3-cd)pyrene	U		29	47	µg/Kg-dry	1	4/14/2016 02:50
Isophorone	U		42	1,200	µg/Kg-dry	1	4/14/2016 02:50
Naphthalene	U		12	47	µg/Kg-dry	1	4/14/2016 02:50
Nitrobenzene	U		52	1,200	µg/Kg-dry	1	4/14/2016 02:50
N-Nitrosodimethylamine	U		210	1,200	µg/Kg-dry	1	4/14/2016 02:50
N-Nitrosodi-n-propylamine	U		47	230	µg/Kg-dry	1	4/14/2016 02:50
N-Nitrosodiphenylamine	U		36	230	µg/Kg-dry	1	4/14/2016 02:50
Pentachlorophenol	U		80	230	µg/Kg-dry	1	4/14/2016 02:50
Phenanthrene	**59**		**26**	**47**	**µg/Kg-dry**	1	4/14/2016 02:50
Phenol	U		47	230	µg/Kg-dry	1	4/14/2016 02:50
Pyrene	U		36	47	µg/Kg-dry	1	4/14/2016 02:50
Surr: 2,4,6-Tribromophenol	*107*			*34-140*	*%REC*	1	4/14/2016 02:50
Surr: 2-Fluorobiphenyl	*82.0*			*12-100*	*%REC*	1	4/14/2016 02:50
Surr: 2-Fluorophenol	*90.8*			*33-117*	*%REC*	1	4/14/2016 02:50
Surr: 4-Terphenyl-d14	*90.6*			*25-137*	*%REC*	1	4/14/2016 02:50
Surr: Nitrobenzene-d5	*89.5*			*37-107*	*%REC*	1	4/14/2016 02:50
Surr: Phenol-d6	*88.3*			*40-106*	*%REC*	1	4/14/2016 02:50
VOLATILE ORGANICS - METHANOL CORRECTED		Method:	**SW8260B**		Prep: SW5035 / 4/12/16		Analyst: **BG**
1,1,1-Trichloroethane	U		46	160	µg/Kg-dry	1	4/13/2016 21:55
1,1,2,2-Tetrachloroethane	U		39	160	µg/Kg-dry	1	4/13/2016 21:55
1,1,2-Trichloroethane	U		48	160	µg/Kg-dry	1	4/13/2016 21:55
1,1-Dichloroethane	U		41	160	µg/Kg-dry	1	4/13/2016 21:55

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:D-3: S000090
Collection Date: 4/9/2016 04:30 PM

Work Order: 1604561
Lab ID: 1604561-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		43	160	µg/Kg-dry	1	4/13/2016 21:55
1,2-Dichlorobenzene	U		48	160	µg/Kg-dry	1	4/13/2016 21:55
1,2-Dichloroethane	U		44	160	µg/Kg-dry	1	4/13/2016 21:55
1,2-Dichloropropane	U		45	160	µg/Kg-dry	1	4/13/2016 21:55
1,3-Dichlorobenzene	U		52	160	µg/Kg-dry	1	4/13/2016 21:55
1,4-Dichlorobenzene	U		42	160	µg/Kg-dry	1	4/13/2016 21:55
Acrolein	U		490	1,100	µg/Kg-dry	1	4/13/2016 21:55
Acrylonitrile	U		140	540	µg/Kg-dry	1	4/13/2016 21:55
Benzene	U		37	160	µg/Kg-dry	1	4/13/2016 21:55
Bromodichloromethane	U		43	160	µg/Kg-dry	1	4/13/2016 21:55
Bromoform	U		57	160	µg/Kg-dry	1	4/13/2016 21:55
Bromomethane	U		70	410	µg/Kg-dry	1	4/13/2016 21:55
Carbon tetrachloride	U		29	160	µg/Kg-dry	1	4/13/2016 21:55
Chlorobenzene	U		49	160	µg/Kg-dry	1	4/13/2016 21:55
Chloroethane	U		100	540	µg/Kg-dry	1	4/13/2016 21:55
Chloroform	U		55	160	µg/Kg-dry	1	4/13/2016 21:55
Chloromethane	U		66	540	µg/Kg-dry	1	4/13/2016 21:55
cis-1,2-Dichloroethene	U		46	160	µg/Kg-dry	1	4/13/2016 21:55
cis-1,3-Dichloropropene	U		62	160	µg/Kg-dry	1	4/13/2016 21:55
Dibromochloromethane	U		37	160	µg/Kg-dry	1	4/13/2016 21:55
Ethylbenzene	U		38	160	µg/Kg-dry	1	4/13/2016 21:55
Methylene chloride	U		74	160	µg/Kg-dry	1	4/13/2016 21:55
Tetrachloroethene	U		80	160	µg/Kg-dry	1	4/13/2016 21:55
Toluene	U		54	160	µg/Kg-dry	1	4/13/2016 21:55
trans-1,2-Dichloroethene	U		46	160	µg/Kg-dry	1	4/13/2016 21:55
trans-1,3-Dichloropropene	U		29	160	µg/Kg-dry	1	4/13/2016 21:55
Trichloroethene	U		43	160	µg/Kg-dry	1	4/13/2016 21:55
Vinyl chloride	U		51	160	µg/Kg-dry	1	4/13/2016 21:55
Surr: 1,2-Dichloroethane-d4	*92.0*			*70-130*	*%REC*	1	4/13/2016 21:55
Surr: 4-Bromofluorobenzene	*92.0*			*70-130*	*%REC*	1	4/13/2016 21:55
Surr: Dibromofluoromethane	*89.3*			*70-130*	*%REC*	1	4/13/2016 21:55
Surr: Toluene-d8	*96.8*			*70-130*	*%REC*	1	4/13/2016 21:55
BIOCHEMICAL OXYGEN DEMAND		Method:	**A5210B-97**		Prep: A5210B / 4/12/16		Analyst: **TVD**
Biochemical Oxygen Demand	U	H	28	28	mg/Kg-dry	1	4/17/2016 11:30
CHLORIDE		Method:	**A4500-CL E-97**		Prep: EXTRACT / 4/18/16		Analyst: **ED**
Chloride	**37**		**3.0**	**28**	**mg/Kg-dry**	1	4/19/2016 12:50
CYANIDE, TOTAL		Method:	**SW9012B**		Prep: SW9012B / 4/14/16		Analyst: **JB**
Cyanide, Total	**0.053**	J	**0.032**	**1.4**	**mg/Kg-dry**	1	4/14/2016 09:54

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:D-3: S000090
Collection Date: 4/9/2016 04:30 PM

Work Order: 1604561
Lab ID: 1604561-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND			Method: **E410.4 R2.0**		Prep: EXTRACT / 4/15/16		Analyst: **JJG**
Chemical Oxygen Demand	**490**	J	**240**	**1,300**	**mg/Kg-dry**	1	4/19/2016 09:55
MOISTURE			Method: **SW3550C**				Analyst: **ED**
Moisture	**65**		**0.025**	**0.050**	**% of sample**	1	4/12/2016 16:48
NITROGEN, TOTAL			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total	**280**		**0**	**2.8**	**mg/Kg-dry**	1	4/18/2016 07:50
AMMONIA AS NITROGEN			Method: **A4500-NH3 G-97**		Prep: A4500-NH3 B / 4/14/16		Analyst: **JJG**
Ammonia as Nitrogen	**44**		**9.0**	**30**	**mg NH3-N/Kg-dry**	1	4/15/2016 10:19
NITROGEN, NITRITE			Method: **A4500-NO2 B**		Prep: EXTRACT / 4/13/16		Analyst: **JB**
Nitrogen, Nitrite	U		0.022	2.0	mg/Kg-dry	1	4/13/2016 14:00
NITROGEN, NITRATE			Method: **E353.2**		Prep: EXTRACT / 4/13/16		Analyst: **JJG**
Nitrogen, Nitrate	**0.38**	J	**0.12**	**2.5**	**mg/Kg-dry**	1	4/13/2016 11:59
NITROGEN, NITRATE-NITRITE			Method: **E353.2**		Prep: EXTRACT / 4/13/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**0.25**	J	**0.20**	**2.5**	**mg/Kg-dry**	1	4/13/2016 11:59
NITROGEN, TOTAL INORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Inorganic	**43**		**0**	**0.057**	**mg/Kg-dry**	1	4/18/2016 07:50
NITROGEN, TOTAL ORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Organic	**240**		**2.8**	**2.8**	**mg/Kg-dry**	1	4/18/2016 07:50
PHOSPHORUS, TOTAL			Method: **E365.1 R2.0**		Prep: E365.1 R2.0 / 4/14/16		Analyst: **JJG**
Phosphorus, Total	**1,800**		**200**	**820**	**mg/Kg-dry**	50	4/14/2016 11:38
PH			Method: **SW9045D**		Prep: EXTRACT / 4/12/16		Analyst: **STP**
pH	**9.0**		**0**		**s.u.**	1	4/12/2016 16:00
PHOSPHORUS, ORTHO-P (AS P)			Method: **A4500-P E-97**		Prep: E365.1 R2.0 / 4/14/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**41**		**1.3**	**2.7**	**mg/Kg-dry**	1	4/14/2016 13:21
NITROGEN, TOTAL KJELDAHL			Method: **A4500-NH3 G-97**		Prep: A4500-N B / 4/12/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**290**		**8.4**	**18**	**mg/Kg-dry**	1	4/13/2016 09:41
ORGANIC CARBON - WALKLEY-BLACK			Method: **TITRAMETRIC**				Analyst: **KF**
Organic Carbon - W-B	**0.75**		**0.034**	**0.071**	**% by wt-dry**	1	4/13/2016 10:20

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:FB-1: W041116
Collection Date: 4/11/2016 09:00 AM

Work Order: 1604561
Lab ID: 1604561-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3510 / 4/12/16		Analyst: **BLM**
Aroclor 1016	U		0.048	0.20	µg/L	1	4/13/2016 12:14
Aroclor 1221	U		0.048	0.20	µg/L	1	4/13/2016 12:14
Aroclor 1232	U		0.048	0.20	µg/L	1	4/13/2016 12:14
Aroclor 1242	U		0.048	0.20	µg/L	1	4/13/2016 12:14
Aroclor 1248	U		0.048	0.20	µg/L	1	4/13/2016 12:14
Aroclor 1254	U		0.031	0.20	µg/L	1	4/13/2016 12:14
Aroclor 1260	U		0.031	0.20	µg/L	1	4/13/2016 12:14
Surr: Decachlorobiphenyl	*66.0*			*40-110*	*%REC*	1	4/13/2016 12:14
Surr: Tetrachloro-m-xylene	*61.0*			*40-110*	*%REC*	1	4/13/2016 12:14
PESTICIDES		Method: **SW8081A**			Prep: SW3510C / 4/12/16		Analyst: **BLM**
4,4´-DDD	U		0.0012	0.020	µg/L	1	4/12/2016 17:41
4,4´-DDE	U		0.0017	0.020	µg/L	1	4/12/2016 17:41
4,4´-DDT	U		0.0017	0.020	µg/L	1	4/12/2016 17:41
Aldrin	U		0.0028	0.010	µg/L	1	4/12/2016 17:41
alpha-BHC	U		0.0012	0.010	µg/L	1	4/12/2016 17:41
beta-BHC	U		0.0066	0.010	µg/L	1	4/12/2016 17:41
Chlordane, Technical	U		0.034	0.50	µg/L	1	4/12/2016 17:41
delta-BHC	U		0.0026	0.010	µg/L	1	4/12/2016 17:41
Dieldrin	U		0.0022	0.020	µg/L	1	4/12/2016 17:41
Endosulfan I	U		0.0017	0.020	µg/L	1	4/12/2016 17:41
Endosulfan II	U		0.0012	0.020	µg/L	1	4/12/2016 17:41
Endosulfan sulfate	U		0.0015	0.020	µg/L	1	4/12/2016 17:41
Endrin	U		0.0018	0.020	µg/L	1	4/12/2016 17:41
Endrin aldehyde	U		0.0028	0.020	µg/L	1	4/12/2016 17:41
gamma-BHC (Lindane)	U		0.0015	0.010	µg/L	1	4/12/2016 17:41
Heptachlor	U		0.0017	0.010	µg/L	1	4/12/2016 17:41
Heptachlor epoxide	U		0.0012	0.010	µg/L	1	4/12/2016 17:41
Toxaphene	U		0.11	2.0	µg/L	1	4/12/2016 17:41
Surr: Decachlorobiphenyl	*62.0*			*42-119*	*%REC*	1	4/12/2016 17:41
Surr: Tetrachloro-m-xylene	*63.0*			*32-104*	*%REC*	1	4/12/2016 17:41
MERCURY BY CVAA		Method: **SW7470A**			Prep: SW7470A / 4/15/16		Analyst: **LR**
Mercury	U		0.000018	0.00020	mg/L	1	4/18/2016 10:01
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3005A / 4/13/16		Analyst: **ML**
Magnesium	**0.023**	J	**0.019**	**0.20**	**mg/L**	1	4/14/2016 04:17
Potassium	U		0.034	0.20	mg/L	1	4/14/2016 04:17
Sodium	U		0.051	0.20	mg/L	1	4/14/2016 04:17

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:FB-1: W041116
Collection Date: 4/11/2016 09:00 AM

Work Order: 1604561
Lab ID: 1604561-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3005A / 4/18/16		Analyst: **RH**
Antimony	U		0.00010	0.0050	mg/L	1	4/19/2016 07:04
Arsenic	U		0.00070	0.0050	mg/L	1	4/19/2016 07:04
Beryllium	U		0.00020	0.0020	mg/L	1	4/19/2016 07:04
Cadmium	U		0.00010	0.0020	mg/L	1	4/19/2016 07:04
Chromium	U		0.00010	0.0050	mg/L	1	4/19/2016 07:04
Copper	**0.00098**	J	**0.00020**	**0.0050**	**mg/L**	1	4/19/2016 07:04
Lead	U		0.00010	0.0050	mg/L	1	4/19/2016 07:04
Nickel	U		0.00040	0.0050	mg/L	1	4/19/2016 07:04
Selenium	U		0.0010	0.0050	mg/L	1	4/19/2016 07:04
Silver	U		0.00010	0.0050	mg/L	1	4/19/2016 07:04
Thallium	U		0.00040	0.0020	mg/L	1	4/19/2016 07:04
Zinc	**0.0096**	J	**0.0024**	**0.010**	**mg/L**	1	4/19/2016 07:04
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3510C / 4/13/16		Analyst: **RM**
1,2-Diphenylhydrazine	U		0.22	1.0	µg/L	1	4/13/2016 23:26
2,4,6-Trichlorophenol	U		0.25	1.0	µg/L	1	4/13/2016 23:26
2,4-Dichlorophenol	U		0.17	1.0	µg/L	1	4/13/2016 23:26
2,4-Dimethylphenol	U		0.18	1.0	µg/L	1	4/13/2016 23:26
2,4-Dinitrophenol	U		1.5	5.0	µg/L	1	4/13/2016 23:26
2,4-Dinitrotoluene	U		0.14	1.0	µg/L	1	4/13/2016 23:26
2,6-Dinitrotoluene	U		0.20	1.0	µg/L	1	4/13/2016 23:26
2-Chloronaphthalene	U		0.030	0.10	µg/L	1	4/13/2016 23:26
2-Chlorophenol	U		0.29	1.0	µg/L	1	4/13/2016 23:26
2-Nitrophenol	U		0.27	1.0	µg/L	1	4/13/2016 23:26
3,3´-Dichlorobenzidine	U		0.70	5.0	µg/L	1	4/13/2016 23:26
4,6-Dinitro-2-methylphenol	U		0.12	1.0	µg/L	1	4/13/2016 23:26
4-Bromophenyl phenyl ether	U		0.29	1.0	µg/L	1	4/13/2016 23:26
4-Chloro-3-methylphenol	U		0.16	1.0	µg/L	1	4/13/2016 23:26
4-Chlorophenyl phenyl ether	U		0.20	1.0	µg/L	1	4/13/2016 23:26
4-Nitrophenol	U		0.62	5.0	µg/L	1	4/13/2016 23:26
Acenaphthene	U		0.041	0.10	µg/L	1	4/13/2016 23:26
Acenaphthylene	U		0.039	0.10	µg/L	1	4/13/2016 23:26
Anthracene	U		0.028	0.10	µg/L	1	4/13/2016 23:26
Benzidine	U		1.6	5.0	µg/L	1	4/13/2016 23:26
Benzo(a)anthracene	U		0.072	0.10	µg/L	1	4/13/2016 23:26
Benzo(a)pyrene	U		0.036	0.10	µg/L	1	4/13/2016 23:26
Benzo(b)fluoranthene	U		0.043	0.10	µg/L	1	4/13/2016 23:26
Benzo(g,h,i)perylene	U		0.070	0.10	µg/L	1	4/13/2016 23:26
Benzo(k)fluoranthene	U		0.062	0.10	µg/L	1	4/13/2016 23:26

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:FB-1: W041116
Collection Date: 4/11/2016 09:00 AM

Work Order: 1604561
Lab ID: 1604561-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		0.23	1.0	µg/L	1	4/13/2016 23:26
Bis(2-chloroethyl)ether	U		0.16	1.0	µg/L	1	4/13/2016 23:26
Bis(2-chloroisopropyl)ether	U		0.19	1.0	µg/L	1	4/13/2016 23:26
Bis(2-ethylhexyl)phthalate	U		0.18	1.0	µg/L	1	4/13/2016 23:26
Butyl benzyl phthalate	U		0.12	1.0	µg/L	1	4/13/2016 23:26
Chrysene	U		0.042	0.10	µg/L	1	4/13/2016 23:26
Dibenzo(a,h)anthracene	U		0.074	0.10	µg/L	1	4/13/2016 23:26
Diethyl phthalate	U		0.17	1.0	µg/L	1	4/13/2016 23:26
Dimethyl phthalate	U		0.15	1.0	µg/L	1	4/13/2016 23:26
Di-n-butyl phthalate	U		0.15	1.0	µg/L	1	4/13/2016 23:26
Di-n-octyl phthalate	U		0.15	1.0	µg/L	1	4/13/2016 23:26
Fluoranthene	U		0.047	0.10	µg/L	1	4/13/2016 23:26
Fluorene	U		0.036	0.10	µg/L	1	4/13/2016 23:26
Hexachlorobenzene	U		0.23	1.0	µg/L	1	4/13/2016 23:26
Hexachlorobutadiene	U		0.37	1.0	µg/L	1	4/13/2016 23:26
Hexachlorocyclopentadiene	U		0.18	1.0	µg/L	1	4/13/2016 23:26
Hexachloroethane	U		0.47	1.0	µg/L	1	4/13/2016 23:26
Indeno(1,2,3-cd)pyrene	U		0.064	0.10	µg/L	1	4/13/2016 23:26
Naphthalene	U		0.050	0.10	µg/L	1	4/13/2016 23:26
Nitrobenzene	U		0.23	1.0	µg/L	1	4/13/2016 23:26
N-Nitrosodimethylamine	U		0.30	1.0	µg/L	1	4/13/2016 23:26
N-Nitrosodi-n-propylamine	U		0.24	1.0	µg/L	1	4/13/2016 23:26
N-Nitrosodiphenylamine	U		0.24	1.0	µg/L	1	4/13/2016 23:26
Pentachlorophenol	U		0.52	5.0	µg/L	1	4/13/2016 23:26
Phenanthrene	U		0.054	0.10	µg/L	1	4/13/2016 23:26
Phenol	U		0.13	1.0	µg/L	1	4/13/2016 23:26
Pyrene	U		0.069	0.10	µg/L	1	4/13/2016 23:26
Surr: 2,4,6-Tribromophenol	*69.3*			*38-115*	*%REC*	1	4/13/2016 23:26
Surr: 2-Fluorobiphenyl	*53.9*			*32-100*	*%REC*	1	4/13/2016 23:26
Surr: 2-Fluorophenol	*37.9*			*22-59*	*%REC*	1	4/13/2016 23:26
Surr: 4-Terphenyl-d14	*72.2*			*23-112*	*%REC*	1	4/13/2016 23:26
Surr: Nitrobenzene-d5	*64.1*			*31-93*	*%REC*	1	4/13/2016 23:26
Surr: Phenol-d6	*24.1*			*13-36*	*%REC*	1	4/13/2016 23:26
VOLATILE ORGANIC COMPOUNDS - AQUEOUS		Method: **SW8260B**					Analyst: **LSY**
1,1,1-Trichloroethane	U		0.19	1.0	µg/L	1	4/15/2016 17:21
1,1,2,2-Tetrachloroethane	U		0.34	1.0	µg/L	1	4/15/2016 17:21
1,1,2-Trichloroethane	U		0.25	1.0	µg/L	1	4/15/2016 17:21
1,1-Dichloroethane	U		0.21	1.0	µg/L	1	4/15/2016 17:21
1,1-Dichloroethene	U		0.24	1.0	µg/L	1	4/15/2016 17:21

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:FB-1: W041116
Collection Date: 4/11/2016 09:00 AM

Work Order: 1604561
Lab ID: 1604561-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,2-Dichlorobenzene	U		0.22	1.0	µg/L	1	4/15/2016 17:21
1,2-Dichloroethane	U		0.26	1.0	µg/L	1	4/15/2016 17:21
1,2-Dichloropropane	U		0.26	1.0	µg/L	1	4/15/2016 17:21
1,3-Dichlorobenzene	U		0.21	1.0	µg/L	1	4/15/2016 17:21
1,4-Dichlorobenzene	U		0.20	1.0	µg/L	1	4/15/2016 17:21
Acrolein	U		4.1	10	µg/L	1	4/15/2016 17:21
Acrylonitrile	U		0.38	1.0	µg/L	1	4/15/2016 17:21
Benzene	U		0.25	1.0	µg/L	1	4/15/2016 17:21
Bromodichloromethane	U		0.16	1.0	µg/L	1	4/15/2016 17:21
Bromoform	U		0.099	1.0	µg/L	1	4/15/2016 17:21
Bromomethane	U		1.0	1.0	µg/L	1	4/15/2016 17:21
Carbon tetrachloride	U		0.14	1.0	µg/L	1	4/15/2016 17:21
Chlorobenzene	U		0.19	1.0	µg/L	1	4/15/2016 17:21
Chloroethane	U		0.21	1.0	µg/L	1	4/15/2016 17:21
Chloroform	U		0.25	1.0	µg/L	1	4/15/2016 17:21
Chloromethane	U		0.25	1.0	µg/L	1	4/15/2016 17:21
cis-1,3-Dichloropropene	U		0.24	1.0	µg/L	1	4/15/2016 17:21
Dibromochloromethane	U		0.17	1.0	µg/L	1	4/15/2016 17:21
Methylene chloride	U		0.64	5.0	µg/L	1	4/15/2016 17:21
Tetrachloroethene	U		0.25	1.0	µg/L	1	4/15/2016 17:21
Toluene	U		0.20	1.0	µg/L	1	4/15/2016 17:21
trans-1,2-Dichloroethene	U		0.29	1.0	µg/L	1	4/15/2016 17:21
trans-1,3-Dichloropropene	U		0.19	1.0	µg/L	1	4/15/2016 17:21
Trichloroethene	U		0.34	1.0	µg/L	1	4/15/2016 17:21
Vinyl chloride	U		0.19	1.0	µg/L	1	4/15/2016 17:21
Surr: 1,2-Dichloroethane-d4	*99.6*			*75-120*	*%REC*	1	4/15/2016 17:21
Surr: 4-Bromofluorobenzene	*93.6*			*80-110*	*%REC*	1	4/15/2016 17:21
Surr: Dibromofluoromethane	*95.2*			*85-115*	*%REC*	1	4/15/2016 17:21
Surr: Toluene-d8	*99.3*			*85-110*	*%REC*	1	4/15/2016 17:21
BIOCHEMICAL OXYGEN DEMAND		Method: **A5210B-01**			Prep: A5210B / 4/12/16		Analyst: **TVD**
Biochemical Oxygen Demand	U		2.0	2.0	mg/L	1	4/17/2016 11:30
CHLORIDE		Method: **A4500-CL E-97**					Analyst: **ED**
Chloride	U		0.11	1.0	mg/L	1	4/14/2016 12:15
CYANIDE, TOTAL		Method: **SW9012B**			Prep: SW9012B / 4/18/16		Analyst: **JB**
Cyanide, Total	U		0.0020	0.0050	mg/L	1	4/18/2016 14:17
CHEMICAL OXYGEN DEMAND		Method: **E410.4 R2.0**					Analyst: **JJG**
Chemical Oxygen Demand	**4.7**	J	**3.0**	**5.0**	**mg/L**	1	4/14/2016 16:10

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001 - Lagoon D
Sample ID: RCK001:FB-1: W041116
Collection Date: 4/11/2016 09:00 AM

Work Order: 1604561
Lab ID: 1604561-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
NITROGEN, TOTAL			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total	**<1**		**0**	**1.0**	**mg/L**	1	4/19/2016 14:30
AMMONIA AS NITROGEN			Method: **A4500-NH3 G-97**				Analyst: **JJG**
Ammonia as Nitrogen	U		0.0060	0.020	mg NH3-N/L	1	4/13/2016 10:32
NITROGEN, NITRATE			Method: **E353.2 R2.0**				Analyst: **JJG**
Nitrogen, Nitrate	**0.028**		**0.0090**	**0.020**	**mg/L**	1	4/13/2016 11:59
NITROGEN, NITRATE-NITRITE			Method: **E353.2 R2.0**				Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**0.026**		**0.013**	**0.020**	**mg/L**	1	4/13/2016 11:59
NITROGEN, TOTAL INORGANIC			Method: **CALCULATION**				Analyst: **JJG**
Nitrogen, Total Inorganic	**0.026**		**0**	**0.020**	**mg/L**	1	4/14/2016 08:43
NITROGEN, TOTAL ORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Organic	*<1*		1.0	1.0	mg/L	1	4/19/2016 14:30
PHOSPHORUS, TOTAL			Method: **E365.1 R2.0**				Analyst: **JJG**
Phosphorus, Total	U		0.024	0.050	mg/L	1	4/14/2016 11:38
PH (LABORATORY)			Method: **SW9040C**				Analyst: **ED**
pH (laboratory)	**6.2**		**0**		**s.u.**	1	4/12/2016 13:40
PHOSPHORUS, ORTHO-P (AS P)			Method: **A4500-P E-99**				Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**0.024**	J	**0.0080**	**0.050**	**mg/L**	1	4/12/2016 14:05
NITROGEN, TOTAL KJELDAHL			Method: **A4500-NH3 G-97**		Prep: A4500-N B / 4/18/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	U		0.48	1.0	mg/L	1	4/19/2016 12:32

Note: See Qualifiers page for a list of qualifiers and their definitions.

Batch ID: **84612** Instrument ID **GC12** Method: **SW8081A**

MBLK	Sample ID: **PBLKW1-84612-84612**			Units: **µg/L**		Analysis Date: **4/12/2016 04:54 PM**				
Client ID:		Run ID: **GC12_160412A**		SeqNo: **3773668**		Prep Date: **4/12/2016**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	U	0.020								
4,4´-DDE	U	0.020								
4,4´-DDT	U	0.020								
Aldrin	U	0.010								
alpha-BHC	U	0.010								
beta-BHC	U	0.010								
Chlordane, Technical	U	0.50								
delta-BHC	U	0.010								
Dieldrin	U	0.020								
Endosulfan I	U	0.020								
Endosulfan II	U	0.020								
Endosulfan sulfate	U	0.020								
Endrin	U	0.020								
Endrin aldehyde	U	0.020								
gamma-BHC (Lindane)	U	0.010								
Heptachlor	U	0.010								
Heptachlor epoxide	U	0.010								
Toxaphene	U	2.0								
Surr: Decachlorobiphenyl	*0.049*	0	*0.1*	0	*49*	*42-119*	0			
Surr: Tetrachloro-m-xylene	*0.04*	0	*0.1*	0	*40*	*32-104*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84612** Instrument ID **GC12** Method: **SW8081A**

LCS Sample ID: **PLCSW1-84612-84612** Units: **µg/L** Analysis Date: **4/12/2016 05:09 PM**
Client ID: Run ID: **GC12_160412A** SeqNo: **3773669** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	0.063	0.020	0.1	0	63	33-126	0			
4,4´-DDE	0.05	0.020	0.1	0	50	34-112	0			
4,4´-DDT	0.059	0.020	0.1	0	59	41-122	0			
Aldrin	0.027	0.010	0.1	0	27	25-150	0			
alpha-BHC	0.053	0.010	0.1	0	53	31-109	0			
beta-BHC	0.055	0.010	0.1	0	55	38-108	0			
delta-BHC	0.059	0.010	0.1	0	59	36-114	0			
Dieldrin	0.056	0.020	0.1	0	56	35-114	0			
Endosulfan I	0.058	0.020	0.1	0	58	32-114	0			
Endosulfan II	0.062	0.020	0.1	0	62	40-119	0			
Endosulfan sulfate	0.063	0.020	0.1	0	63	42-120	0			
Endrin	0.072	0.020	0.1	0	72	39-123	0			
Endrin aldehyde	0.058	0.020	0.1	0	58	29-116	0			
gamma-BHC (Lindane)	0.056	0.010	0.1	0	56	32-114	0			
Heptachlor	0.047	0.010	0.1	0	47	34-112	0			
Heptachlor epoxide	0.055	0.010	0.1	0	55	36-109	0			
Surr: Decachlorobiphenyl	*0.053*	0	*0.1*	0	*53*	*42-119*	0			
Surr: Tetrachloro-m-xylene	*0.046*	0	*0.1*	0	*46*	*32-104*	0			

LCSD Sample ID: **PLCSDW1-84612-84612** Units: **µg/L** Analysis Date: **4/12/2016 05:25 PM**
Client ID: Run ID: **GC12_160412A** SeqNo: **3773670** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	0.056	0.020	0.1	0	56	33-126	0.063	11.8	30	
4,4´-DDE	0.047	0.020	0.1	0	47	34-112	0.05	6.19	30	
4,4´-DDT	0.055	0.020	0.1	0	55	41-122	0.059	7.02	30	
Aldrin	0.032	0.010	0.1	0	32	25-150	0.027	16.9	30	
alpha-BHC	0.048	0.010	0.1	0	48	31-109	0.053	9.9	30	
beta-BHC	0.049	0.010	0.1	0	49	38-108	0.055	11.5	30	
delta-BHC	0.053	0.010	0.1	0	53	36-114	0.059	10.7	30	
Dieldrin	0.051	0.020	0.1	0	51	35-114	0.056	9.35	30	
Endosulfan I	0.053	0.020	0.1	0	53	32-114	0.058	9.01	30	
Endosulfan II	0.057	0.020	0.1	0	57	40-119	0.062	8.4	30	
Endosulfan sulfate	0.056	0.020	0.1	0	56	42-120	0.063	11.8	30	
Endrin	0.065	0.020	0.1	0	65	39-123	0.072	10.2	30	
Endrin aldehyde	0.053	0.020	0.1	0	53	29-116	0.058	9.01	30	
gamma-BHC (Lindane)	0.05	0.010	0.1	0	50	32-114	0.056	11.3	30	
Heptachlor	0.047	0.010	0.1	0	47	34-112	0.047	0	30	
Heptachlor epoxide	0.049	0.010	0.1	0	49	36-109	0.055	11.5	30	
Surr: Decachlorobiphenyl	*0.042*	0	*0.1*	0	*42*	*42-119*	0.053	*23.2*	*30*	
Surr: Tetrachloro-m-xylene	*0.038*	0	*0.1*	0	*38*	*32-104*	0.046	*19*	*30*	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84612** Instrument ID **GC12** Method: **SW8081A**

The following samples were analyzed in this batch: 1604561-03F

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84613** Instrument ID **GC12** Method: **SW8082**

MBLK Sample ID: **PBLKW1-84613-84613** Units: **µg/L** Analysis Date: **4/13/2016 11:09 AM**
Client ID: Run ID: **GC12_160413A** SeqNo: **3774158** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	U	0.20								
Aroclor 1221	U	0.20								
Aroclor 1232	U	0.20								
Aroclor 1242	U	0.20								
Aroclor 1248	U	0.20								
Aroclor 1254	U	0.20								
Aroclor 1260	U	0.20								
Surr: Decachlorobiphenyl	*0.05*	0	*0.1*	0	*50*	*40-110*	0			
Surr: Tetrachloro-m-xylene	*0.041*	0	*0.1*	0	*41*	*40-110*	0			

LCS Sample ID: **PLCSW1-84613-84613** Units: **µg/L** Analysis Date: **4/13/2016 11:25 AM**
Client ID: Run ID: **GC12_160413A** SeqNo: **3774159** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	1.83	0.20	2.5	0	73.2	50-130	0			
Aroclor 1260	1.875	0.20	2.5	0	75	50-130	0			
Surr: Decachlorobiphenyl	*0.065*	0	*0.1*	0	*65*	*40-110*	0			
Surr: Tetrachloro-m-xylene	*0.058*	0	*0.1*	0	*58*	*40-110*	0			

LCSD Sample ID: **PLCSDW1-84613-84613** Units: **µg/L** Analysis Date: **4/13/2016 11:42 AM**
Client ID: Run ID: **GC12_160413A** SeqNo: **3774160** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	1.953	0.20	2.5	0	78.1	50-130	1.83	6.5	30	
Aroclor 1260	1.969	0.20	2.5	0	78.8	50-130	1.875	4.89	30	
Surr: Decachlorobiphenyl	*0.067*	0	*0.1*	0	*67*	*40-110*	0.065	*3.03*		
Surr: Tetrachloro-m-xylene	*0.061*	0	*0.1*	0	*61*	*40-110*	0.058	*5.04*		

The following samples were analyzed in this batch: 1604561-03F

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84711** Instrument ID **GC14** Method: **SW8082**

MBLK Sample ID: **PBLKS1-84711-84711** Units: **µg/Kg** Analysis Date: **4/14/2016 08:04 PM**
Client ID: Run ID: **GC14_160414A** SeqNo: **3777863** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	U	83								
Aroclor 1221	U	83								
Aroclor 1232	U	83								
Aroclor 1242	U	83								
Aroclor 1248	U	83								
Aroclor 1254	U	83								
Aroclor 1260	U	83								
Surr: Decachlorobiphenyl	*33*	0	*33.3*	0	*99.1*	*40-140*	0			
Surr: Tetrachloro-m-xylene	*32*	0	*33.3*	0	*96.1*	*45-124*	0			

LCS Sample ID: **PLCSS1-84711-84711** Units: **µg/Kg** Analysis Date: **4/14/2016 08:20 PM**
Client ID: Run ID: **GC14_160414A** SeqNo: **3777864** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	917.7	83	833	0	110	50-130	0			
Aroclor 1260	962	83	833	0	115	50-130	0			
Surr: Decachlorobiphenyl	*33.67*	0	*33.3*	0	*101*	*40-140*	0			
Surr: Tetrachloro-m-xylene	*30.33*	0	*33.3*	0	*91.1*	*45-124*	0			

MS Sample ID: **1604669-06B MS** Units: **µg/Kg** Analysis Date: **4/14/2016 08:53 PM**
Client ID: Run ID: **GC14_160414A** SeqNo: **3777866** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	942.8	83	832.5	0	113	40-140	0			
Aroclor 1260	1012	83	832.5	0	122	40-140	0			
Surr: Decachlorobiphenyl	*29.98*	0	*33.28*	0	*90.1*	*40-140*	0			
Surr: Tetrachloro-m-xylene	*27.98*	0	*33.28*	0	*84.1*	*45-124*	0			

MSD Sample ID: **1604669-06B MSD** Units: **µg/Kg** Analysis Date: **4/14/2016 09:09 PM**
Client ID: Run ID: **GC14_160414A** SeqNo: **3777867** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	830.4	79	792.6	0	105	40-140	942.8	12.7	50	
Aroclor 1260	961.7	79	792.6	0	121	40-140	1012	5.14	50	
Surr: Decachlorobiphenyl	*29.18*	0	*31.69*	0	*92.1*	*40-140*	29.98	*2.71*		
Surr: Tetrachloro-m-xylene	*26.33*	0	*31.69*	0	*83.1*	*45-124*	27.98	*6.1*		

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84712** Instrument ID **GC12** Method: **SW8081A**

MBLK Sample ID: **PBLKS1-84712-84712** Units: **µg/Kg** Analysis Date: **4/14/2016 07:46 PM**
Client ID: Run ID: **GC12_160414A** SeqNo: **3777434** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	U	10								
4,4´-DDE	U	10								
4,4´-DDT	U	10								
Aldrin	U	10								
alpha-BHC	U	10								
alpha-Chlordane	U	10								
beta-BHC	U	10								
Chlordane, Technical	U	25								
delta-BHC	U	10								
Dieldrin	U	10								
Endosulfan I	U	10								
Endosulfan II	U	10								
Endosulfan sulfate	U	10								
Endrin	U	10								
Endrin aldehyde	U	10								
gamma-BHC (Lindane)	U	10								
Heptachlor	U	10								
Heptachlor epoxide	U	10								
Toxaphene	U	60								
Surr: Decachlorobiphenyl	*42.67*	0	*33.3*	0	*128*	*45-135*	0			
Surr: Tetrachloro-m-xylene	*35.67*	0	*33.3*	0	*107*	*45-124*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **84712** Instrument ID **GC12** Method: **SW8081A**

LCS Sample ID: **PLCSS1-84712-84712** Units: **µg/Kg** Analysis Date: **4/14/2016 08:02 PM**
Client ID: Run ID: **GC12_160414A** SeqNo: **3777435** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	41.33	10	33.33	0	124	30-135	0			
4,4´-DDE	36.67	10	33.33	0	110	70-125	0			
4,4´-DDT	39	10	33.33	0	117	45-140	0			
Aldrin	34.67	10	33.33	0	104	45-140	0			
alpha-BHC	36.33	10	33.33	0	109	60-125	0			
alpha-Chlordane	38	10	33.33	0	114	50-150	0			
beta-BHC	36.67	10	33.33	0	110	60-125	0			
delta-BHC	38	10	33.33	0	114	55-130	0			
Dieldrin	39	10	33.33	0	117	65-125	0			
Endosulfan I	39.33	10	33.33	0	118	15-135	0			
Endosulfan II	42.33	10	33.33	0	127	35-140	0			
Endosulfan sulfate	41	10	33.33	0	123	60-135	0			
Endrin	51	10	33.33	0	153	60-135	0			S
Endrin aldehyde	32.67	10	33.33	0	98	35-145	0			
gamma-BHC (Lindane)	37.33	10	33.33	0	112	60-125	0			
Heptachlor	38.67	10	33.33	0	116	50-140	0			
Heptachlor epoxide	37	10	33.33	0	111	65-130	0			
Surr: Decachlorobiphenyl	*43*	0	*33.3*	0	*129*	*45-135*	0			
Surr: Tetrachloro-m-xylene	*34.67*	0	*33.3*	0	*104*	*45-124*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **84712** Instrument ID **GC12** Method: **SW8081A**

MS Sample ID: **1604561-02C MS** Units: **µg/Kg** Analysis Date: **4/14/2016 08:50 PM**

Client ID: **RCK001:D-3: S000090** Run ID: **GC12_160414A** SeqNo: **3777438** Prep Date: **4/14/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	39.11	20	32.59	0	120	30-135	0			
4,4´-DDE	35.85	20	32.59	0	110	70-125	0			
4,4´-DDT	31.29	20	32.59	0	96	45-140	0			
Aldrin	31.94	20	32.59	0	98	45-140	0			
alpha-BHC	31.29	20	32.59	0	96	60-125	0			
alpha-Chlordane	36.5	20	32.59	0	112	50-150	0			
beta-BHC	36.5	20	32.59	0	112	60-125	0			
delta-BHC	38.46	20	32.59	0	118	55-130	0			
Dieldrin	37.16	20	32.59	0	114	65-125	0			
Endosulfan I	38.46	20	32.59	0	118	15-135	0			
Endosulfan II	40.41	20	32.59	0	124	35-140	0			
Endosulfan sulfate	37.81	20	32.59	0	116	60-135	0			
Endrin	40.41	20	32.59	0	124	60-135	0			
Endrin aldehyde	32.59	20	32.59	0	100	35-145	0			
gamma-BHC (Lindane)	32.59	20	32.59	0	100	60-125	0			
Heptachlor	33.9	20	32.59	0	104	50-140	0			
Heptachlor epoxide	33.9	20	32.59	0	104	65-130	0			
Surr: Decachlorobiphenyl	*39.11*	0	*32.56*	0	*120*	*45-135*	0			
Surr: Tetrachloro-m-xylene	*25.42*	0	*32.56*	0	*78.1*	*45-124*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84712** Instrument ID **GC12** Method: **SW8081A**

MSD Sample ID: **1604561-02C MSD** Units: **µg/Kg** Analysis Date: **4/14/2016 09:05 PM**
Client ID: **RCK001:D-3: S000090** Run ID: **GC12_160414A** SeqNo: **3777439** Prep Date: **4/14/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	24.77	19	31.75	0	78	30-135	39.11	44.9	35	R
4,4´-DDE	25.41	19	31.75	0	80	70-125	35.85	34.1	35	
4,4´-DDT	20.33	19	31.75	0	64	45-140	31.29	42.5	35	R
Aldrin	28.58	19	31.75	0	90	45-140	31.94	11.1	35	
alpha-BHC	28.58	19	31.75	0	90	60-125	31.29	9.04	35	
alpha-Chlordane	29.22	19	31.75	0	92	50-150	36.5	22.2	35	
beta-BHC	31.76	19	31.75	0	100	60-125	36.5	13.9	35	
delta-BHC	31.76	19	31.75	0	100	55-130	38.46	19.1	35	
Dieldrin	29.22	19	31.75	0	92	65-125	37.16	23.9	35	
Endosulfan I	31.76	19	31.75	0	100	15-135	38.46	19.1	35	
Endosulfan II	27.95	19	31.75	0	88	35-140	40.41	36.5	35	R
Endosulfan sulfate	24.77	19	31.75	0	78	60-135	37.81	41.7	35	R
Endrin	30.49	19	31.75	0	96	60-135	40.41	28	35	
Endrin aldehyde	22.23	19	31.75	0	70	35-145	32.59	37.8	35	R
gamma-BHC (Lindane)	32.39	19	31.75	0	102	60-125	32.59	0.613	35	
Heptachlor	29.22	19	31.75	0	92	50-140	33.9	14.8	35	
Heptachlor epoxide	31.12	19	31.75	0	98	65-130	33.9	8.53	35	
Surr: Decachlorobiphenyl	*22.87*	0	*31.73*	0	*72.1*	*45-135*	39.11	*52.4*	*35*	*R*
Surr: Tetrachloro-m-xylene	*25.41*	0	*31.73*	0	*80.1*	*45-124*	25.42	*0.0613*	*35*	

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84783** Instrument ID **HG1** Method: **SW7470A**

MBLK Sample ID: **MBLK-84783-84783** Units: **mg/L** Analysis Date: **4/18/2016 09:56 AM**
Client ID: Run ID: **HG1_160418A** SeqNo: **3779727** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.00020								

LCS Sample ID: **LCS-84783-84783** Units: **mg/L** Analysis Date: **4/18/2016 09:58 AM**
Client ID: Run ID: **HG1_160418A** SeqNo: **3779728** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00213	0.00020	0.002	0	106	80-120	0			

MS Sample ID: **1604561-03DMS** Units: **mg/L** Analysis Date: **4/18/2016 10:03 AM**
Client ID: **RCK001:FB-1: W041116** Run ID: **HG1_160418A** SeqNo: **3779730** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00207	0.00020	0.002	-0.00003	105	75-125	0			

MSD Sample ID: **1604561-03DMSD** Units: **mg/L** Analysis Date: **4/18/2016 10:05 AM**
Client ID: **RCK001:FB-1: W041116** Run ID: **HG1_160418A** SeqNo: **3779731** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00212	0.00020	0.002	-0.00003	108	75-125	0.00207	2.39	20	

The following samples were analyzed in this batch: 1604561-03D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84787** Instrument ID **HG1** Method: **SW7471A**

MBLK Sample ID: **MBLK-84787-84787** Units: **mg/Kg** Analysis Date: **4/18/2016 10:07 AM**
Client ID: Run ID: **HG1_160418A** SeqNo: **3779737** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.020								

LCS Sample ID: **LCS-84787-84787** Units: **mg/Kg** Analysis Date: **4/18/2016 10:09 AM**
Client ID: Run ID: **HG1_160418A** SeqNo: **3779738** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1867	0.020	0.1665	0	112	80-120	0			

MS Sample ID: **1604500-01CMS** Units: **mg/Kg** Analysis Date: **4/18/2016 10:14 AM**
Client ID: Run ID: **HG1_160418A** SeqNo: **3779740** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1381	0.015	0.1232	0.00354	109	75-125	0			

MSD Sample ID: **1604500-01CMSD** Units: **mg/Kg** Analysis Date: **4/18/2016 10:16 AM**
Client ID: Run ID: **HG1_160418A** SeqNo: **3779741** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1365	0.015	0.1223	0.00354	109	75-125	0.1381	1.18	35	

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84660** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-84660-84660** Units: **mg/L** Analysis Date: **4/13/2016 11:14 PM**
Client ID: Run ID: **ICPMS1_160413A** SeqNo: **3775636** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	U	0.20								
Potassium	U	0.20								

MBLK Sample ID: **MBLK-84660-84660** Units: **mg/L** Analysis Date: **4/14/2016 04:18 PM**
Client ID: Run ID: **ICPMS1_160414A** SeqNo: **3777650** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	U	0.20								

LCS Sample ID: **LCS-84660-84660** Units: **mg/L** Analysis Date: **4/13/2016 11:21 PM**
Client ID: Run ID: **ICPMS1_160413A** SeqNo: **3775637** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	9.465	0.20	10	0	94.6	80-120	0			
Potassium	9.566	0.20	10	0	95.7	80-120	0			
Sodium	9.309	0.20	10	0	93.1	80-120	0			

MS Sample ID: **1604074-04BMS** Units: **mg/L** Analysis Date: **4/13/2016 11:52 PM**
Client ID: Run ID: **ICPMS1_160413A** SeqNo: **3775642** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	55.54	0.20	10	45.96	95.8	75-125	0			O
Potassium	12.73	0.20	10	3.318	94.1	75-125	0			
Sodium	39.16	0.20	10	29.49	96.7	75-125	0			

MSD Sample ID: **1604074-04BMSD** Units: **mg/L** Analysis Date: **4/13/2016 11:58 PM**
Client ID: Run ID: **ICPMS1_160413A** SeqNo: **3775643** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	57.24	0.20	10	45.96	113	75-125	55.54	3.01	20	O
Potassium	13.44	0.20	10	3.318	101	75-125	12.73	5.43	20	
Sodium	40.38	0.20	10	29.49	109	75-125	39.16	3.07	20	

The following samples were analyzed in this batch: 1604561-03D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84767** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-84767-84767** Units: **mg/Kg** Analysis Date: **4/15/2016 07:30 PM**
Client ID: Run ID: **ICPMS1_160415A** SeqNo: **3779283** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.50								
Arsenic	U	0.50								
Beryllium	U	0.50								
Cadmium	U	0.50								
Chromium	U	0.50								
Copper	U	0.50								
Lead	U	0.50								
Nickel	U	0.50								
Selenium	0.04284	0.50								J
Silver	U	0.50								
Thallium	U	0.50								
Zinc	U	0.50								

LCS Sample ID: **LCS-84767-84767** Units: **mg/Kg** Analysis Date: **4/15/2016 07:37 PM**
Client ID: Run ID: **ICPMS1_160415A** SeqNo: **3779284** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	4.75	0.50	5	0	95	80-120	0			
Arsenic	4.578	0.50	5	0	91.6	80-120	0			
Beryllium	4.81	0.50	5	0	96.2	80-120	0			
Cadmium	4.748	0.50	5	0	95	80-120	0			
Chromium	4.928	0.50	5	0	98.6	80-120	0			
Copper	4.791	0.50	5	0	95.8	80-120	0			
Lead	4.95	0.50	5	0	99	80-120	0			
Nickel	4.848	0.50	5	0	97	80-120	0			
Selenium	4.523	0.50	5	0	90.5	80-120	0			
Silver	4.938	0.50	5	0	98.8	80-120	0			
Thallium	4.752	0.50	5	0	95	80-120	0			
Zinc	4.672	0.50	5	0	93.4	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84767** Instrument ID **ICPMS1** Method: **SW6020A**

MS Sample ID: **1604500-02CMS** Units: **mg/Kg** Analysis Date: **4/15/2016 08:14 PM**
Client ID: Run ID: **ICPMS1_160415A** SeqNo: **3779290** Prep Date: **4/15/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.393	7.0	6.964	-0.0751	92.9	75-125	0			J
Arsenic	7.159	7.0	6.964	0.3987	97.1	75-125	0			
Beryllium	7.256	7.0	6.964	0.04205	104	75-125	0			
Cadmium	6.955	7.0	6.964	0.06317	99	75-125	0			J
Chromium	7.994	7.0	6.964	0.7999	103	75-125	0			
Copper	8.364	7.0	6.964	2.061	90.5	75-125	0			
Lead	7.953	7.0	6.964	0.8222	102	75-125	0			
Nickel	9.875	7.0	6.964	3.363	93.5	75-125	0			
Selenium	7.019	7.0	6.964	0.4705	94	75-125	0			
Silver	6.667	7.0	6.964	0.02299	95.4	75-125	0			J
Thallium	6.841	7.0	6.964	0.03469	97.7	75-125	0			J
Zinc	12.05	7.0	6.964	5.37	95.9	75-125	0			

MSD Sample ID: **1604500-02CMSD** Units: **mg/Kg** Analysis Date: **4/15/2016 08:20 PM**
Client ID: Run ID: **ICPMS1_160415A** SeqNo: **3779291** Prep Date: **4/15/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	7.507	7.0	7.022	-0.0751	108	75-125	6.393	16	25	
Arsenic	8.708	7.0	7.022	0.3987	118	75-125	7.159	19.5	25	
Beryllium	8.188	7.0	7.022	0.04205	116	75-125	7.256	12.1	25	
Cadmium	7.949	7.0	7.022	0.06317	112	75-125	6.955	13.3	25	
Chromium	8.883	7.0	7.022	0.7999	115	75-125	7.994	10.5	25	
Copper	9.544	7.0	7.022	2.061	107	75-125	8.364	13.2	25	
Lead	8.94	7.0	7.022	0.8222	116	75-125	7.953	11.7	25	
Nickel	11.12	7.0	7.022	3.363	111	75-125	9.875	11.9	25	
Selenium	8.153	7.0	7.022	0.4705	109	75-125	7.019	14.9	25	
Silver	7.577	7.0	7.022	0.02299	108	75-125	6.667	12.8	25	
Thallium	7.858	7.0	7.022	0.03469	111	75-125	6.841	13.8	25	
Zinc	13.34	7.0	7.022	5.37	113	75-125	12.05	10.2	25	

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84826** Instrument ID **ICPMS2** Method: **SW6020A**

MBLK Sample ID: **MBLK-84826-84826** Units: **mg/L** Analysis Date: **4/19/2016 06:54 AM**
Client ID: Run ID: **ICPMS2_160418A** SeqNo: **3781101** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.0050								
Arsenic	U	0.0050								
Beryllium	U	0.0020								
Cadmium	U	0.0020								
Chromium	0.0001505	0.0050								J
Copper	U	0.0050								
Lead	U	0.0050								
Nickel	U	0.0050								
Selenium	U	0.0050								
Silver	U	0.0050								
Thallium	U	0.0020								
Zinc	U	0.010								

LCS Sample ID: **LCS-84826-84826** Units: **mg/L** Analysis Date: **4/19/2016 06:59 AM**
Client ID: Run ID: **ICPMS2_160418A** SeqNo: **3781102** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09284	0.0050	0.1	0	92.8	80-120	0			
Arsenic	0.09082	0.0050	0.1	0	90.8	80-120	0			
Beryllium	0.09458	0.0020	0.1	0	94.6	80-120	0			
Cadmium	0.09257	0.0020	0.1	0	92.6	80-120	0			
Chromium	0.0909	0.0050	0.1	0	90.9	80-120	0			
Copper	0.09164	0.0050	0.1	0	91.6	80-120	0			
Lead	0.09078	0.0050	0.1	0	90.8	80-120	0			
Nickel	0.09166	0.0050	0.1	0	91.7	80-120	0			
Selenium	0.09179	0.0050	0.1	0	91.8	80-120	0			
Silver	0.09394	0.0050	0.1	0	93.9	80-120	0			
Thallium	0.08916	0.0020	0.1	0	89.2	80-120	0			
Zinc	0.09136	0.010	0.1	0	91.4	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84826** Instrument ID **ICPMS2** Method: **SW6020A**

MS Sample ID: **1604561-03DMS** Units: **mg/L** Analysis Date: **4/19/2016 07:10 AM**
Client ID: **RCK001:FB-1: W041116** Run ID: **ICPMS2_160418A** SeqNo: **3781104** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09286	0.0050	0.1	0.00002809	92.8	75-125	0			
Arsenic	0.09177	0.0050	0.1	0.0001538	91.6	75-125	0			
Beryllium	0.09539	0.0020	0.1	0.0001002	95.3	75-125	0			
Cadmium	0.08948	0.0020	0.1	0.00001199	89.5	75-125	0			
Chromium	0.09076	0.0050	0.1	0.00009768	90.7	75-125	0			
Copper	0.0911	0.0050	0.1	0.0009754	90.1	75-125	0			
Lead	0.08679	0.0050	0.1	0.00005274	86.7	75-125	0			
Nickel	0.09122	0.0050	0.1	0.0002916	90.9	75-125	0			
Selenium	0.09306	0.0050	0.1	-0.0003489	93.4	75-125	0			
Silver	0.09281	0.0050	0.1	-2.023E-06	92.8	75-125	0			
Thallium	0.08527	0.0020	0.1	0.0001333	85.1	75-125	0			
Zinc	0.1011	0.010	0.1	0.009564	91.5	75-125	0			

MSD Sample ID: **1604561-03DMSD** Units: **mg/L** Analysis Date: **4/19/2016 07:38 AM**
Client ID: **RCK001:FB-1: W041116** Run ID: **ICPMS2_160418A** SeqNo: **3781108** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09101	0.0050	0.1	0	91	75-125	0.09286	2.01	20	
Arsenic	0.09211	0.0050	0.1	0	92.1	75-125	0.09177	0.37	20	
Beryllium	0.09621	0.0020	0.1	0	96.2	75-125	0.09539	0.856	20	
Cadmium	0.09274	0.0020	0.1	0	92.7	75-125	0.08948	3.58	20	
Chromium	0.09158	0.0050	0.1	0	91.6	75-125	0.09076	0.899	20	
Selenium	0.09329	0.0050	0.1	0	93.3	75-125	0.09306	0.247	20	
Silver	0.09364	0.0050	0.1	0	93.6	75-125	0.09281	0.89	20	
Thallium	0.09072	0.0020	0.1	0	90.7	75-125	0.08527	6.19	20	

MSD Sample ID: **1604561-03DMSD** Units: **mg/L** Analysis Date: **4/19/2016 02:59 PM**
Client ID: **RCK001:FB-1: W041116** Run ID: **ICPMS2_160419A** SeqNo: **3783180** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Copper	0.1036	0.0050	0.1	0.0009754	103	75-125	0.0911	12.8	20	
Lead	0.1052	0.0050	0.1	0	105	75-125	0.08679	19.2	20	
Nickel	0.1029	0.0050	0.1	0	103	75-125	0.09122	12	20	
Zinc	0.1132	0.010	0.1	0.009564	104	75-125	0.1011	11.3	20	

The following samples were analyzed in this batch: 1604561-03D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84957** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-84957-84957** Units: **mg/Kg** Analysis Date: **4/15/2016 07:30 PM**
Client ID: Run ID: **ICPMS1_160415A** SeqNo: **3784864** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	0.9305	10								J
Potassium	U	10								

LCS Sample ID: **LCS-84957-84957** Units: **mg/Kg** Analysis Date: **4/15/2016 07:37 PM**
Client ID: Run ID: **ICPMS1_160415A** SeqNo: **3784865** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	507.5	10	500	0	102	80-120	0			
Potassium	504	10	500	0	101	80-120	0			
Sodium	504.5	10	500	0	101	80-120	0			

MS Sample ID: **1604500-02CMS** Units: **mg/Kg** Analysis Date: **4/15/2016 08:14 PM**
Client ID: Run ID: **ICPMS1_160415A** SeqNo: **3784867** Prep Date: **4/20/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	7068	140	696.4	6515	79.4	75-125	0			O
Potassium	851.7	140	696.4	107.5	107	75-125	0			
Sodium	862.1	140	696.4	154.5	102	75-125	0			

MSD Sample ID: **1604500-02CMSD** Units: **mg/Kg** Analysis Date: **4/15/2016 08:20 PM**
Client ID: Run ID: **ICPMS1_160415A** SeqNo: **3784868** Prep Date: **4/20/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	8167	140	702.2	6515	235	75-125	7068	14.4	25	SO
Potassium	938.9	140	702.2	107.5	118	75-125	851.7	9.74	25	
Sodium	981	140	702.2	154.5	118	75-125	862.1	12.9	25	

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **84642** Instrument ID **SVMS8** Method: **SW8270C**

MBLK Sample ID: **SBLKW1-84642-84642** Units: **µg/L** Analysis Date: **4/13/2016 05:48 PM**

Client ID: Run ID: **SVMS8_160413A** SeqNo: **3776106** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	1.0								
2,4,6-Trichlorophenol	U	1.0								
2,4-Dichlorophenol	U	1.0								
2,4-Dimethylphenol	U	1.0								
2,4-Dinitrophenol	U	5.0								
2,4-Dinitrotoluene	U	1.0								
2,6-Dinitrotoluene	U	1.0								
2-Chloronaphthalene	U	0.10								
2-Chlorophenol	U	1.0								
2-Nitrophenol	U	1.0								
3,3´-Dichlorobenzidine	U	5.0								
4,6-Dinitro-2-methylphenol	U	1.0								
4-Bromophenyl phenyl ether	U	1.0								
4-Chloro-3-methylphenol	U	1.0								
4-Chlorophenyl phenyl ether	U	1.0								
4-Nitrophenol	U	5.0								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Benzidine	U	5.0								
Benzo(a)anthracene	U	0.10								
Benzo(a)pyrene	U	0.10								
Benzo(b)fluoranthene	U	0.10								
Benzo(g,h,i)perylene	U	0.10								
Benzo(k)fluoranthene	U	0.10								
Bis(2-chloroethoxy)methane	U	1.0								
Bis(2-chloroethyl)ether	U	1.0								
Bis(2-chloroisopropyl)ether	U	1.0								
Bis(2-ethylhexyl)phthalate	U	1.0								
Butyl benzyl phthalate	U	1.0								
Chrysene	U	0.10								
Dibenzo(a,h)anthracene	U	0.10								
Diethyl phthalate	U	1.0								
Dimethyl phthalate	U	1.0								
Di-n-butyl phthalate	U	1.0								
Di-n-octyl phthalate	U	1.0								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Hexachlorobenzene	U	1.0								
Hexachlorobutadiene	U	1.0								
Hexachlorocyclopentadiene	U	1.0								
Hexachloroethane	U	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **84642** Instrument ID **SVMS8** Method: **SW8270C**

Indeno(1,2,3-cd)pyrene	U	0.10					
Naphthalene	U	0.10					
Nitrobenzene	U	1.0					
N-Nitrosodimethylamine	U	1.0					
N-Nitrosodi-n-propylamine	U	1.0					
N-Nitrosodiphenylamine	U	1.0					
Pentachlorophenol	U	5.0					
Phenanthrene	U	0.10					
Phenol	U	1.0					
Pyrene	U	0.10					
Surr: 2,4,6-Tribromophenol	*32.58*	0	*50*	0	*65.2*	*38-115*	0
Surr: 2-Fluorobiphenyl	*31.78*	0	*50*	0	*63.6*	*32-100*	0
Surr: 2-Fluorophenol	*19.87*	0	*50*	0	*39.7*	*22-59*	0
Surr: 4-Terphenyl-d14	*38.94*	0	*50*	0	*77.9*	*23-112*	0
Surr: Nitrobenzene-d5	*35.25*	0	*50*	0	*70.5*	*31-93*	0
Surr: Phenol-d6	*12.43*	0	*50*	0	*24.9*	*13-36*	0

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84642** Instrument ID **SVMS8** Method: **SW8270C**

LCS	Sample ID: **SLCSW1-84642-84642**				Units: **µg/L**			Analysis Date: **4/13/2016 06:09 PM**			
Client ID:		Run ID: **SVMS8_160413A**			SeqNo: **3776107**			Prep Date: **4/13/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	15.18	1.0	20	0	75.9	55-115	0			
2,4,6-Trichlorophenol	12.38	1.0	20	0	61.9	50-115	0			
2,4-Dichlorophenol	14.22	1.0	20	0	71.1	50-105	0			
2,4-Dimethylphenol	13.6	1.0	20	0	68	30-110	0			
2,4-Dinitrophenol	10.63	5.0	20	0	53.2	15-140	0			
2,4-Dinitrotoluene	15.64	1.0	20	0	78.2	50-120	0			
2,6-Dinitrotoluene	14.68	1.0	20	0	73.4	50-115	0			
2-Chloronaphthalene	13.12	0.10	20	0	65.6	50-105	0			
2-Chlorophenol	13.47	1.0	20	0	67.4	35-105	0			
2-Nitrophenol	13.77	1.0	20	0	68.8	40-115	0			
3,3´-Dichlorobenzidine	16.07	5.0	20	0	80.4	30-120	0			
4,6-Dinitro-2-methylphenol	14.06	1.0	20	0	70.3	40-130	0			
4-Bromophenyl phenyl ether	15.13	1.0	20	0	75.6	50-115	0			
4-Chloro-3-methylphenol	15.11	1.0	20	0	75.6	45-110	0			
4-Chlorophenyl phenyl ether	14.19	1.0	20	0	71	50-110	0			
4-Nitrophenol	6.43	5.0	20	0	32.2	1-58	0			
Acenaphthene	13.5	0.10	20	0	67.5	45-110	0			
Acenaphthylene	13.7	0.10	20	0	68.5	50-105	0			
Anthracene	16.12	0.10	20	0	80.6	55-110	0			
Benzo(a)anthracene	15.22	0.10	20	0	76.1	55-110	0			
Benzo(a)pyrene	15.71	0.10	20	0	78.6	55-110	0			
Benzo(b)fluoranthene	15.98	0.10	20	0	79.9	45-120	0			
Benzo(g,h,i)perylene	19.02	0.10	20	0	95.1	40-125	0			
Benzo(k)fluoranthene	16.14	0.10	20	0	80.7	45-125	0			
Bis(2-chloroethoxy)methane	15.45	1.0	20	0	77.2	45-105	0			
Bis(2-chloroethyl)ether	15.01	1.0	20	0	75	35-110	0			
Bis(2-chloroisopropyl)ether	16.65	1.0	20	0	83.2	25-130	0			
Bis(2-ethylhexyl)phthalate	14.62	1.0	20	0	73.1	40-125	0			
Butyl benzyl phthalate	13.7	1.0	20	0	68.5	45-115	0			
Chrysene	16.93	0.10	20	0	84.6	55-110	0			
Dibenzo(a,h)anthracene	17.85	0.10	20	0	89.2	40-125	0			
Diethyl phthalate	14.62	1.0	20	0	73.1	40-120	0			
Dimethyl phthalate	14.52	1.0	20	0	72.6	25-125	0			
Di-n-butyl phthalate	16.68	1.0	20	0	83.4	55-115	0			
Di-n-octyl phthalate	10.96	1.0	20	0	54.8	35-135	0			
Fluoranthene	18.1	0.10	20	0	90.5	55-115	0			
Fluorene	14.31	0.10	20	0	71.6	50-110	0			
Hexachlorobenzene	15.64	1.0	20	0	78.2	50-110	0			
Hexachlorobutadiene	14.07	1.0	20	0	70.4	25-105	0			
Hexachlorocyclopentadiene	6.55	1.0	20	0	32.8	25-105	0			
Hexachloroethane	13.57	1.0	20	0	67.8	30-95	0			
Indeno(1,2,3-cd)pyrene	18.29	0.10	20	0	91.4	45-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **84642** Instrument ID **SVMS8** Method: **SW8270C**

Naphthalene	14.35	0.10	20	0	71.8	40-100	0
Nitrobenzene	15.31	1.0	20	0	76.6	45-110	0
N-Nitrosodimethylamine	10.59	1.0	20	0	53	25-110	0
N-Nitrosodi-n-propylamine	16.04	1.0	20	0	80.2	35-130	0
N-Nitrosodiphenylamine	15.12	1.0	20	0	75.6	50-110	0
Pentachlorophenol	13.76	5.0	20	0	68.8	40-115	0
Phenanthrene	15.64	0.10	20	0	78.2	50-115	0
Phenol	5.82	1.0	20	0	29.1	12-43	0
Pyrene	14.47	0.10	20	0	72.4	50-130	0
Surr: 2,4,6-Tribromophenol	*37.64*	0	*50*	0	*75.3*	*38-115*	0
Surr: 2-Fluorobiphenyl	*32.44*	0	*50*	0	*64.9*	*32-100*	0
Surr: 2-Fluorophenol	*19.62*	0	*50*	0	*39.2*	*22-59*	0
Surr: 4-Terphenyl-d14	*35.11*	0	*50*	0	*70.2*	*23-112*	0
Surr: Nitrobenzene-d5	*37.71*	0	*50*	0	*75.4*	*31-93*	0
Surr: Phenol-d6	*13.31*	0	*50*	0	*26.6*	*13-36*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **84642** Instrument ID **SVMS8** Method: **SW8270C**

MS Sample ID: **1604537-02A MS** Units: **µg/L** Analysis Date: **4/13/2016 07:19 PM**
Client ID: Run ID: **SVMS8_160413A** SeqNo: **3776108** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	285.4	20	400	0	71.4	55-115	0			
2,4,6-Trichlorophenol	244.2	20	400	0	61	50-115	0			
2,4-Dichlorophenol	278	20	400	0	69.5	50-105	0			
2,4-Dimethylphenol	248.8	20	400	0	62.2	30-110	0			
2,4-Dinitrophenol	243.6	100	400	0	60.9	15-140	0			
2,4-Dinitrotoluene	301.2	20	400	0	75.3	50-120	0			
2,6-Dinitrotoluene	289.4	20	400	0	72.4	50-115	0			
2-Chloronaphthalene	255	2.0	400	0	63.8	50-105	0			
2-Chlorophenol	267	20	400	0	66.8	35-105	0			
2-Nitrophenol	269.2	20	400	0	67.3	40-115	0			
3,3´-Dichlorobenzidine	315.6	100	400	0	78.9	30-120	0			
4,6-Dinitro-2-methylphenol	276.6	20	400	0	69.2	40-130	0			
4-Bromophenyl phenyl ether	283.8	20	400	0	71	50-115	0			
4-Chloro-3-methylphenol	297.6	20	400	0	74.4	45-110	0			
4-Chlorophenyl phenyl ether	267.2	20	400	0	66.8	50-110	0			
4-Nitrophenol	127.8	100	400	0	32	1-58	0			
Acenaphthene	258.8	2.0	400	0	64.7	45-110	0			
Acenaphthylene	259	2.0	400	0	64.8	50-105	0			
Anthracene	306.8	2.0	400	0	76.7	55-110	0			
Benzo(a)anthracene	297.6	2.0	400	0	74.4	55-110	0			
Benzo(a)pyrene	301.6	2.0	400	0	75.4	55-110	0			
Benzo(b)fluoranthene	308.4	2.0	400	0	77.1	45-120	0			
Benzo(g,h,i)perylene	345.6	2.0	400	0	86.4	40-125	0			
Benzo(k)fluoranthene	311.8	2.0	400	0	78	45-125	0			
Bis(2-chloroethoxy)methane	290.8	20	400	0	72.7	45-105	0			
Bis(2-chloroethyl)ether	292	20	400	0	73	35-110	0			
Bis(2-chloroisopropyl)ether	319	20	400	0	79.8	25-130	0			
Bis(2-ethylhexyl)phthalate	286.8	20	400	0	71.7	40-125	0			
Butyl benzyl phthalate	275.6	20	400	0	68.9	45-115	0			
Chrysene	322	2.0	400	0	80.5	55-110	0			
Dibenzo(a,h)anthracene	328.8	2.0	400	0	82.2	40-125	0			
Diethyl phthalate	280.6	20	400	0	70.2	40-120	0			
Dimethyl phthalate	277.6	20	400	0	69.4	25-125	0			
Di-n-butyl phthalate	320.8	20	400	0	80.2	55-115	0			
Di-n-octyl phthalate	217.6	20	400	0	54.4	35-135	0			
Fluoranthene	349.6	2.0	400	3	86.6	55-115	0			
Fluorene	276	2.0	400	0	69	50-110	0			
Hexachlorobenzene	289.6	20	400	0	72.4	50-110	0			
Hexachlorobutadiene	265.6	20	400	0	66.4	25-105	0			
Hexachlorocyclopentadiene	134.4	20	400	0	33.6	25-105	0			
Hexachloroethane	261.8	20	400	0	65.4	30-95	0			
Indeno(1,2,3-cd)pyrene	337.6	2.0	400	0	84.4	45-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **84642** Instrument ID **SVMS8** Method: **SW8270C**

Naphthalene	270.8	2.0	400	0	67.7	40-100	0
Nitrobenzene	297.8	20	400	0	74.4	45-110	0
N-Nitrosodimethylamine	209.4	20	400	0	52.4	25-110	0
N-Nitrosodi-n-propylamine	318.8	20	400	0	79.7	35-130	0
N-Nitrosodiphenylamine	289.2	20	400	0	72.3	50-110	0
Pentachlorophenol	281	100	400	0	70.2	40-115	0
Phenanthrene	300.6	2.0	400	2.4	74.6	50-115	0
Phenol	114.2	20	400	0	28.6	12-43	0
Pyrene	283	2.0	400	0	70.8	50-130	0
Surr: 2,4,6-Tribromophenol	*724*	0	*1000*	0	*72.4*	*38-115*	0
Surr: 2-Fluorobiphenyl	*616.8*	0	*1000*	0	*61.7*	*32-100*	0
Surr: 2-Fluorophenol	*377*	0	*1000*	0	*37.7*	*22-59*	0
Surr: 4-Terphenyl-d14	*682.2*	0	*1000*	0	*68.2*	*23-112*	0
Surr: Nitrobenzene-d5	*733*	0	*1000*	0	*73.3*	*31-93*	0
Surr: Phenol-d6	*255.2*	0	*1000*	0	*25.5*	*13-36*	0

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84642** Instrument ID **SVMS8** Method: **SW8270C**

MSD	Sample ID: **1604537-02A MSD**				Units: **µg/L**			Analysis Date: **4/13/2016 07:40 PM**			
Client ID:		Run ID: **SVMS8_160413A**			SeqNo: **3776109**			Prep Date: **4/13/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	285.8	20	400	0	71.4	55-115	285.4	0.14	30	
2,4,6-Trichlorophenol	232.2	20	400	0	58	50-115	244.2	5.04	30	
2,4-Dichlorophenol	266.4	20	400	0	66.6	50-105	278	4.26	30	
2,4-Dimethylphenol	243.6	20	400	0	60.9	30-110	248.8	2.11	30	
2,4-Dinitrophenol	248.8	100	400	0	62.2	15-140	243.6	2.11	30	
2,4-Dinitrotoluene	304	20	400	0	76	50-120	301.2	0.925	30	
2,6-Dinitrotoluene	287.2	20	400	0	71.8	50-115	289.4	0.763	30	
2-Chloronaphthalene	240.6	2.0	400	0	60.2	50-105	255	5.81	30	
2-Chlorophenol	256.2	20	400	0	64	35-105	267	4.13	30	
2-Nitrophenol	267.4	20	400	0	66.8	40-115	269.2	0.671	30	
3,3´-Dichlorobenzidine	318.8	100	400	0	79.7	30-120	315.6	1.01	30	
4,6-Dinitro-2-methylphenol	295.6	20	400	0	73.9	40-130	276.6	6.64	30	
4-Bromophenyl phenyl ether	286.6	20	400	0	71.6	50-115	283.8	0.982	30	
4-Chloro-3-methylphenol	293	20	400	0	73.2	45-110	297.6	1.56	30	
4-Chlorophenyl phenyl ether	262.8	20	400	0	65.7	50-110	267.2	1.66	30	
4-Nitrophenol	136	100	400	0	34	1-58	127.8	6.22	30	
Acenaphthene	248.2	2.0	400	0	62	45-110	258.8	4.18	30	
Acenaphthylene	253.2	2.0	400	0	63.3	50-105	259	2.26	30	
Anthracene	310	2.0	400	0	77.5	55-110	306.8	1.04	30	
Benzo(a)anthracene	302.2	2.0	400	0	75.6	55-110	297.6	1.53	30	
Benzo(a)pyrene	302.6	2.0	400	0	75.6	55-110	301.6	0.331	30	
Benzo(b)fluoranthene	308.2	2.0	400	0	77	45-120	308.4	0.0649	30	
Benzo(g,h,i)perylene	332	2.0	400	0	83	40-125	345.6	4.01	30	
Benzo(k)fluoranthene	321.4	2.0	400	0	80.4	45-125	311.8	3.03	30	
Bis(2-chloroethoxy)methane	279.8	20	400	0	70	45-105	290.8	3.86	30	
Bis(2-chloroethyl)ether	287.8	20	400	0	72	35-110	292	1.45	30	
Bis(2-chloroisopropyl)ether	306.6	20	400	0	76.6	25-130	319	3.96	30	
Bis(2-ethylhexyl)phthalate	300.6	20	400	0	75.2	40-125	286.8	4.7	30	
Butyl benzyl phthalate	289.8	20	400	0	72.4	45-115	275.6	5.02	30	
Chrysene	324	2.0	400	0	81	55-110	322	0.619	30	
Dibenzo(a,h)anthracene	320	2.0	400	0	80	40-125	328.8	2.71	30	
Diethyl phthalate	278.4	20	400	0	69.6	40-120	280.6	0.787	30	
Dimethyl phthalate	276.2	20	400	0	69	25-125	277.6	0.506	30	
Di-n-butyl phthalate	336.2	20	400	0	84	55-115	320.8	4.69	30	
Di-n-octyl phthalate	245	20	400	0	61.2	35-135	217.6	11.8	30	
Fluoranthene	352.2	2.0	400	3	87.3	55-115	349.6	0.741	30	
Fluorene	267.2	2.0	400	0	66.8	50-110	276	3.24	30	
Hexachlorobenzene	297	20	400	0	74.2	50-110	289.6	2.52	30	
Hexachlorobutadiene	254.8	20	400	0	63.7	25-105	265.6	4.15	30	
Hexachlorocyclopentadiene	131	20	400	0	32.8	25-105	134.4	2.56	30	
Hexachloroethane	251	20	400	0	62.8	30-95	261.8	4.21	30	
Indeno(1,2,3-cd)pyrene	328.8	2.0	400	0	82.2	45-125	337.6	2.64	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **84642** Instrument ID **SVMS8** Method: **SW8270C**

Naphthalene	258	2.0	400	0	64.5	40-100	270.8	4.84	30
Nitrobenzene	286.8	20	400	0	71.7	45-110	297.8	3.76	30
N-Nitrosodimethylamine	215.4	20	400	0	53.8	25-110	209.4	2.82	30
N-Nitrosodi-n-propylamine	309.4	20	400	0	77.4	35-130	318.8	2.99	30
N-Nitrosodiphenylamine	294.6	20	400	0	73.6	50-110	289.2	1.85	30
Pentachlorophenol	289.4	100	400	0	72.4	40-115	281	2.95	30
Phenanthrene	302.6	2.0	400	2.4	75	50-115	300.6	0.663	30
Phenol	110	20	400	0	27.5	12-43	114.2	3.75	30
Pyrene	290.2	2.0	400	0	72.6	50-130	283	2.51	30
Surr: 2,4,6-Tribromophenol	*711.6*	0	*1000*	0	*71.2*	*38-115*	724	*1.73*	*40*
Surr: 2-Fluorobiphenyl	*590.8*	0	*1000*	0	*59.1*	*32-100*	616.8	*4.31*	*40*
Surr: 2-Fluorophenol	*363.6*	0	*1000*	0	*36.4*	*22-59*	377	*3.62*	*40*
Surr: 4-Terphenyl-d14	*692*	0	*1000*	0	*69.2*	*23-112*	682.2	*1.43*	*40*
Surr: Nitrobenzene-d5	*697.4*	0	*1000*	0	*69.7*	*31-93*	733	*4.98*	*40*
Surr: Phenol-d6	*249*	0	*1000*	0	*24.9*	*13-36*	255.2	*2.46*	*40*

The following samples were analyzed in this batch: 1604561-03F

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

MBLK Sample ID: **SBLKS1-84645-84645** Units: **µg/Kg** Analysis Date: **4/13/2016 05:07 PM**

Client ID: Run ID: **SVMS8_160413A** SeqNo: **3776151** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	33								
2,4,6-Trichlorophenol	U	33								
2,4-Dichlorophenol	U	33								
2,4-Dimethylphenol	U	33								
2,4-Dinitrophenol	U	33								
2,4-Dinitrotoluene	U	33								
2,6-Dinitrotoluene	U	33								
2-Chloronaphthalene	U	6.7								
2-Chlorophenol	U	33								
2-Nitrophenol	U	33								
3,3´-Dichlorobenzidine	U	170								
4,6-Dinitro-2-methylphenol	U	33								
4-Bromophenyl phenyl ether	U	33								
4-Chloro-3-methylphenol	U	33								
4-Chlorophenyl phenyl ether	U	33								
4-Nitrophenol	U	33								
Acenaphthene	U	6.7								
Acenaphthylene	U	6.7								
Anthracene	U	6.7								
Benzidine	U	170								
Benzo(a)anthracene	U	6.7								
Benzo(a)pyrene	U	6.7								
Benzo(b)fluoranthene	U	6.7								
Benzo(g,h,i)perylene	U	6.7								
Benzo(k)fluoranthene	U	6.7								
Bis(2-chloroethoxy)methane	U	33								
Bis(2-chloroethyl)ether	U	33								
Bis(2-chloroisopropyl)ether	U	33								
Bis(2-ethylhexyl)phthalate	U	33								
Butyl benzyl phthalate	U	33								
Chrysene	U	6.7								
Dibenzo(a,h)anthracene	U	6.7								
Diethyl phthalate	U	33								
Dimethyl phthalate	U	33								
Di-n-butyl phthalate	U	33								
Di-n-octyl phthalate	U	33								
Fluoranthene	U	6.7								
Fluorene	U	6.7								
Hexachlorobenzene	U	33								
Hexachlorobutadiene	U	33								
Hexachlorocyclopentadiene	U	33								
Hexachloroethane	U	33								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

Indeno(1,2,3-cd)pyrene	U	6.7					
Isophorone	U	170					
Naphthalene	U	6.7					
Nitrobenzene	U	170					
N-Nitrosodimethylamine	U	170					
N-Nitrosodi-n-propylamine	U	33					
N-Nitrosodiphenylamine	U	33					
Pentachlorophenol	U	33					
Phenanthrene	U	6.7					
Phenol	U	33					
Pyrene	U	6.7					
Surr: 2,4,6-Tribromophenol	*1434*	0	*1667*	0	*86*	*34-140*	0
Surr: 2-Fluorobiphenyl	*1401*	0	*1667*	0	*84.1*	*12-100*	0
Surr: 2-Fluorophenol	*1761*	0	*1667*	0	*106*	*33-117*	0
Surr: 4-Terphenyl-d14	*1622*	0	*1667*	0	*97.3*	*25-137*	0
Surr: Nitrobenzene-d5	*1569*	0	*1667*	0	*94.1*	*37-107*	0
Surr: Phenol-d6	*1759*	0	*1667*	0	*106*	*40-106*	0

QC BATCH REPORT

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

LCS Sample ID: **SLCSS1-84645-84645** Units: **µg/Kg** Analysis Date: **4/13/2016 05:28 PM**
Client ID: Run ID: **SVMS8_160413A** SeqNo: **3776152** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	632.7	33	666.7	0	94.9	55-115	0			
2,4,6-Trichlorophenol	525.7	33	666.7	0	78.8	45-110	0			
2,4-Dichlorophenol	597	33	666.7	0	89.5	45-110	0			
2,4-Dimethylphenol	594.7	33	666.7	0	89.2	30-105	0			
2,4-Dinitrophenol	495.3	33	666.7	0	74.3	15-130	0			
2,4-Dinitrotoluene	647.3	33	666.7	0	97.1	50-115	0			
2,6-Dinitrotoluene	602.3	33	666.7	0	90.3	50-110	0			
2-Chloronaphthalene	507.7	6.7	666.7	0	76.1	45-105	0			
2-Chlorophenol	624.7	33	666.7	0	93.7	45-105	0			
2-Nitrophenol	552.7	33	666.7	0	82.9	40-110	0			
3,3´-Dichlorobenzidine	637.3	170	666.7	0	95.6	30-120	0			
4,6-Dinitro-2-methylphenol	592.7	33	666.7	0	88.9	40-130	0			
4-Bromophenyl phenyl ether	617.7	33	666.7	0	92.6	45-115	0			
4-Chloro-3-methylphenol	686	33	666.7	0	103	45-115	0			
4-Chlorophenyl phenyl ether	553.3	33	666.7	0	83	45-110	0			
4-Nitrophenol	730	33	666.7	0	109	15-140	0			
Acenaphthene	524.7	6.7	666.7	0	78.7	45-110	0			
Acenaphthylene	531.3	6.7	666.7	0	79.7	45-105	0			
Anthracene	662	6.7	666.7	0	99.3	55-105	0			
Benzo(a)anthracene	632	6.7	666.7	0	94.8	50-110	0			
Benzo(a)pyrene	648	6.7	666.7	0	97.2	50-110	0			
Benzo(b)fluoranthene	654.3	6.7	666.7	0	98.1	45-115	0			
Benzo(g,h,i)perylene	734.7	6.7	666.7	0	110	40-125	0			
Benzo(k)fluoranthene	657.7	6.7	666.7	0	98.6	45-115	0			
Bis(2-chloroethoxy)methane	574.7	33	666.7	0	86.2	45-110	0			
Bis(2-chloroethyl)ether	589.3	33	666.7	0	88.4	40-105	0			
Bis(2-chloroisopropyl)ether	642.7	33	666.7	0	96.4	20-115	0			
Bis(2-ethylhexyl)phthalate	638.7	33	666.7	0	95.8	45-125	0			
Butyl benzyl phthalate	617.7	33	666.7	0	92.6	50-125	0			
Chrysene	681.3	6.7	666.7	0	102	55-110	0			
Dibenzo(a,h)anthracene	716.7	6.7	666.7	0	107	40-125	0			
Diethyl phthalate	591	33	666.7	0	88.6	50-115	0			
Dimethyl phthalate	582	33	666.7	0	87.3	50-110	0			
Di-n-butyl phthalate	715	33	666.7	0	107	55-110	0			
Di-n-octyl phthalate	499	33	666.7	0	74.8	40-130	0			
Fluoranthene	734.3	6.7	666.7	0	110	55-115	0			
Fluorene	577	6.7	666.7	0	86.5	50-110	0			
Hexachlorobenzene	633	33	666.7	0	94.9	45-120	0			
Hexachlorobutadiene	538.7	33	666.7	0	80.8	40-115	0			
Hexachlorocyclopentadiene	343.7	33	666.7	0	51.5	40-115	0			
Hexachloroethane	532.7	33	666.7	0	79.9	35-110	0			
Indeno(1,2,3-cd)pyrene	731.3	6.7	666.7	0	110	40-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

Isophorone	568	170	666.7	0	85.2	45-110	0
Naphthalene	543.3	6.7	666.7	0	81.5	40-105	0
Nitrobenzene	597	170	666.7	0	89.5	40-115	0
N-Nitrosodimethylamine	596.7	170	666.7	0	89.5	20-115	0
N-Nitrosodi-n-propylamine	624	33	666.7	0	93.6	40-115	0
N-Nitrosodiphenylamine	639.7	33	666.7	0	95.9	50-115	0
Pentachlorophenol	629.7	33	666.7	0	94.4	25-120	0
Phenanthrene	638.3	6.7	666.7	0	95.7	50-110	0
Phenol	648	33	666.7	0	97.2	40-100	0
Pyrene	610.7	6.7	666.7	0	91.6	45-125	0
Surr: 2,4,6-Tribromophenol	*1578*	0	*1667*	0	*94.7*	*34-140*	0
Surr: 2-Fluorobiphenyl	*1233*	0	*1667*	0	*74*	*12-100*	0
Surr: 2-Fluorophenol	*1511*	0	*1667*	0	*90.6*	*33-117*	0
Surr: 4-Terphenyl-d14	*1429*	0	*1667*	0	*85.8*	*25-137*	0
Surr: Nitrobenzene-d5	*1464*	0	*1667*	0	*87.8*	*37-107*	0
Surr: Phenol-d6	*1551*	0	*1667*	0	*93.1*	*40-106*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

MS	Sample ID: **1604577-01B MS**				Units: **µg/Kg**			Analysis Date: **4/13/2016 08:21 PM**		
Client ID:		Run ID: **SVMS8_160413A**			SeqNo: **3776153**		Prep Date: **4/13/2016**		DF: **1**	

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	615.6	33	660.9	0	93.1	55-115	0			
2,4,6-Trichlorophenol	567	33	660.9	0	85.8	45-110	0			
2,4-Dichlorophenol	634.1	33	660.9	0	95.9	45-110	0			
2,4-Dimethylphenol	617.9	33	660.9	0	93.5	30-105	0			
2,4-Dinitrophenol	497.6	33	660.9	0	75.3	15-130	0			
2,4-Dinitrotoluene	598.1	33	660.9	0	90.5	50-115	0			
2,6-Dinitrotoluene	571.6	33	660.9	0	86.5	50-110	0			
2-Chloronaphthalene	520.1	6.6	660.9	0	78.7	45-105	0			
2-Chlorophenol	567.7	33	660.9	0	85.9	45-105	0			
2-Nitrophenol	525.4	33	660.9	0	79.5	40-110	0			
3,3´-Dichlorobenzidine	301.7	170	660.9	0	45.6	30-120	0			
4,6-Dinitro-2-methylphenol	561.4	33	660.9	0	84.9	40-130	0			
4-Bromophenyl phenyl ether	606.3	33	660.9	0	91.7	45-115	0			
4-Chloro-3-methylphenol	660.8	33	660.9	0	100	45-115	0			
4-Chlorophenyl phenyl ether	545.8	33	660.9	0	82.6	45-110	0			
4-Nitrophenol	636.7	33	660.9	0	96.3	15-140	0			
Acenaphthene	601.7	6.6	660.9	126.2	72	45-110	0			
Acenaphthylene	546.8	6.6	660.9	4.552	82.1	45-105	0			
Anthracene	832	6.6	660.9	341.7	74.2	55-105	0			
Benzo(a)anthracene	1135	6.6	660.9	753.3	57.8	50-110	0			
Benzo(a)pyrene	1137	6.6	660.9	683.7	68.6	50-110	0			
Benzo(b)fluoranthene	1341	6.6	660.9	1030	47.1	45-115	0			
Benzo(g,h,i)perylene	969.8	6.6	660.9	472.1	75.3	40-125	0			
Benzo(k)fluoranthene	945.3	6.6	660.9	335.9	92.2	45-115	0			
Bis(2-chloroethoxy)methane	524	33	660.9	0	79.3	45-110	0			
Bis(2-chloroethyl)ether	516.4	33	660.9	0	78.1	40-105	0			
Bis(2-chloroisopropyl)ether	558.1	33	660.9	0	84.4	20-115	0			
Bis(2-ethylhexyl)phthalate	742.1	33	660.9	0	112	45-125	0			
Butyl benzyl phthalate	751	33	660.9	0	114	50-125	0			
Chrysene	1156	6.6	660.9	807	52.8	55-110	0			S
Dibenzo(a,h)anthracene	687.3	6.6	660.9	115.1	86.6	40-125	0			
Diethyl phthalate	529.3	33	660.9	0	80.1	50-115	0			
Dimethyl phthalate	537.9	33	660.9	0	81.4	50-110	0			
Di-n-butyl phthalate	674	33	660.9	0	102	55-110	0			
Di-n-octyl phthalate	692.2	33	660.9	0	105	40-130	0			
Fluoranthene	2091	6.6	660.9	1726	55.1	55-115	0			E
Fluorene	626.8	6.6	660.9	127.5	75.6	50-110	0			
Hexachlorobenzene	604	33	660.9	0	91.4	45-120	0			
Hexachlorobutadiene	507.8	33	660.9	0	76.8	40-115	0			
Hexachlorocyclopentadiene	384.3	33	660.9	0	58.1	40-115	0			
Hexachloroethane	476.1	33	660.9	0	72	35-110	0			
Indeno(1,2,3-cd)pyrene	1028	6.6	660.9	537.1	74.3	40-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

Isophorone	524.7	170	660.9	0	79.4	45-110	0	
Naphthalene	542.2	6.6	660.9	102.7	66.5	40-105	0	
Nitrobenzene	538.2	170	660.9	0	81.4	40-115	0	
N-Nitrosodimethylamine	512.5	170	660.9	0	77.5	20-115	0	
N-Nitrosodi-n-propylamine	542.5	33	660.9	0	82.1	40-115	0	
N-Nitrosodiphenylamine	611.9	33	660.9	0	92.6	50-115	0	
Pentachlorophenol	621.5	33	660.9	0	94	25-120	0	
Phenanthrene	1344	6.6	660.9	1211	20.2	50-110	0	S
Phenol	611.9	33	660.9	0	92.6	40-100	0	
Pyrene	1840	6.6	660.9	1313	79.8	45-125	0	
Surr: 2,4,6-Tribromophenol	*1503*	0	*1652*	0	*91*	*34-140*	0	
Surr: 2-Fluorobiphenyl	*1222*	0	*1652*	0	*73.9*	*12-100*	0	
Surr: 2-Fluorophenol	*1317*	0	*1652*	0	*79.7*	*33-117*	0	
Surr: 4-Terphenyl-d14	*1589*	0	*1652*	0	*96.2*	*25-137*	0	
Surr: Nitrobenzene-d5	*1305*	0	*1652*	0	*79*	*37-107*	0	
Surr: Phenol-d6	*1416*	0	*1652*	0	*85.7*	*40-106*	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

MSD Sample ID: **1604577-01B MSD** Units: **µg/Kg** Analysis Date: **4/13/2016 08:42 PM**

Client ID: Run ID: **SVMS8_160413A** SeqNo: **3776154** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	641.1	32	656.5	0	97.6	55-115	615.6	4.06	30	
2,4,6-Trichlorophenol	578.4	32	656.5	0	88.1	45-110	567	1.99	30	
2,4-Dichlorophenol	621.4	32	656.5	0	94.6	45-110	634.1	2.02	30	
2,4-Dimethylphenol	600.4	32	656.5	0	91.4	30-105	617.9	2.88	30	
2,4-Dinitrophenol	453.6	32	656.5	0	69.1	15-130	497.6	9.24	30	
2,4-Dinitrotoluene	577.1	32	656.5	0	87.9	50-115	598.1	3.57	30	
2,6-Dinitrotoluene	584.3	32	656.5	0	89	50-110	571.6	2.19	30	
2-Chloronaphthalene	521.9	6.6	656.5	0	79.5	45-105	520.1	0.353	30	
2-Chlorophenol	564.3	32	656.5	0	85.9	45-105	567.7	0.6	30	
2-Nitrophenol	548.5	32	656.5	0	83.5	40-110	525.4	4.31	30	
3,3´-Dichlorobenzidine	312.2	160	656.5	0	47.5	30-120	301.7	3.42	30	
4,6-Dinitro-2-methylphenol	547.2	32	656.5	0	83.3	40-130	561.4	2.56	30	
4-Bromophenyl phenyl ether	626.9	32	656.5	0	95.5	45-115	606.3	3.35	30	
4-Chloro-3-methylphenol	641.4	32	656.5	0	97.7	45-115	660.8	2.99	30	
4-Chlorophenyl phenyl ether	535	32	656.5	0	81.5	45-110	545.8	2	30	
4-Nitrophenol	591.5	32	656.5	0	90.1	15-140	636.7	7.36	30	
Acenaphthene	572.1	6.6	656.5	126.2	67.9	45-110	601.7	5.04	30	
Acenaphthylene	536.7	6.6	656.5	4.552	81.1	45-105	546.8	1.87	30	
Anthracene	738.6	6.6	656.5	341.7	60.4	55-105	832	11.9	30	
Benzo(a)anthracene	964.4	6.6	656.5	753.3	32.1	50-110	1135	16.3	30	S
Benzo(a)pyrene	1011	6.6	656.5	683.7	49.8	50-110	1137	11.8	30	S
Benzo(b)fluoranthene	1125	6.6	656.5	1030	14.5	45-115	1341	17.6	30	S
Benzo(g,h,i)perylene	905	6.6	656.5	472.1	65.9	40-125	969.8	6.91	30	
Benzo(k)fluoranthene	816.3	6.6	656.5	335.9	73.2	45-115	945.3	14.6	30	
Bis(2-chloroethoxy)methane	522.9	32	656.5	0	79.6	45-110	524	0.218	30	
Bis(2-chloroethyl)ether	534.7	32	656.5	0	81.4	40-105	516.4	3.48	30	
Bis(2-chloroisopropyl)ether	554.7	32	656.5	0	84.5	20-115	558.1	0.599	30	
Bis(2-ethylhexyl)phthalate	1070	32	656.5	0	163	45-125	742.1	36.2	30	SR
Butyl benzyl phthalate	703.4	32	656.5	0	107	50-125	751	6.55	30	
Chrysene	1004	6.6	656.5	807	30	55-110	1156	14.1	30	S
Dibenzo(a,h)anthracene	646.6	6.6	656.5	115.1	81	40-125	687.3	6.09	30	
Diethyl phthalate	501.9	32	656.5	0	76.4	50-115	529.3	5.32	30	
Dimethyl phthalate	529.5	32	656.5	0	80.6	50-110	537.9	1.58	30	
Di-n-butyl phthalate	618.1	32	656.5	0	94.1	55-110	674	8.66	30	
Di-n-octyl phthalate	571.1	32	656.5	0	87	40-130	692.2	19.2	30	
Fluoranthene	1472	6.6	656.5	1726	-38.7	55-115	2091	34.7	30	SR
Fluorene	589.5	6.6	656.5	127.5	70.4	50-110	626.8	6.13	30	
Hexachlorobenzene	609.2	32	656.5	0	92.8	45-120	604	0.861	30	
Hexachlorobutadiene	507.5	32	656.5	0	77.3	40-115	507.8	0.0748	30	
Hexachlorocyclopentadiene	368.6	32	656.5	0	56.1	40-115	384.3	4.16	30	
Hexachloroethane	492.7	32	656.5	0	75	35-110	476.1	3.42	30	
Indeno(1,2,3-cd)pyrene	936.2	6.6	656.5	537.1	60.8	40-120	1028	9.34	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

Isophorone	535.4	160	656.5	0	81.5	45-110	524.7	2.01	30	
Naphthalene	514.7	6.6	656.5	102.7	62.7	40-105	542.2	5.21	30	
Nitrobenzene	540.3	160	656.5	0	82.3	40-115	538.2	0.38	30	
N-Nitrosodimethylamine	521.9	160	656.5	0	79.5	20-115	512.5	1.82	30	
N-Nitrosodi-n-propylamine	543.6	32	656.5	0	82.8	40-115	542.5	0.19	30	
N-Nitrosodiphenylamine	621	32	656.5	0	94.6	50-115	611.9	1.48	30	
Pentachlorophenol	584.9	32	656.5	0	89.1	25-120	621.5	6.06	30	
Phenanthrene	1127	6.6	656.5	1211	-12.9	50-110	1344	17.6	30	S
Phenol	598.1	32	656.5	0	91.1	40-100	611.9	2.29	30	
Pyrene	1649	6.6	656.5	1313	51.3	45-125	1840	10.9	30	
Surr: 2,4,6-Tribromophenol	*1497*	0	*1641*	0	*91.2*	*34-140*	1503	*0.373*	*40*	
Surr: 2-Fluorobiphenyl	*1217*	0	*1641*	0	*74.1*	*12-100*	1222	*0.389*	*40*	
Surr: 2-Fluorophenol	*1300*	0	*1641*	0	*79.2*	*33-117*	1317	*1.31*	*40*	
Surr: 4-Terphenyl-d14	*1591*	0	*1641*	0	*97*	*25-137*	1589	*0.128*	*40*	
Surr: Nitrobenzene-d5	*1330*	0	*1641*	0	*81*	*37-107*	1305	*1.92*	*40*	
Surr: Phenol-d6	*1374*	0	*1641*	0	*83.7*	*40-106*	1416	*3.04*	*40*	

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **84608** Instrument ID **VMS6** Method: **SW8260B**

MBLK Sample ID: **MBLK-84608-84608** Units: **µg/Kg-dry** Analysis Date: **4/12/2016 01:10 PM**
Client ID: Run ID: **VMS6_160412A** SeqNo: **3773819** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	U	30								
1,1,2,2-Tetrachloroethane	U	30								
1,1,2-Trichloroethane	U	30								
1,1-Dichloroethane	U	30								
1,1-Dichloroethene	U	30								
1,2-Dichlorobenzene	U	30								
1,2-Dichloroethane	U	30								
1,2-Dichloropropane	U	30								
1,3-Dichlorobenzene	U	30								
1,4-Dichlorobenzene	U	30								
Acrolein	U	200								
Acrylonitrile	U	100								
Benzene	U	30								
Bromodichloromethane	U	30								
Bromoform	U	30								
Bromomethane	U	75								
Carbon tetrachloride	U	30								
Chlorobenzene	U	30								
Chloroethane	U	100								
Chloroform	U	30								
Chloromethane	U	100								
cis-1,2-Dichloroethene	U	30								
cis-1,3-Dichloropropene	U	30								
Dibromochloromethane	U	30								
Ethylbenzene	U	30								
Methylene chloride	U	30								
Tetrachloroethene	U	30								
Toluene	U	30								
trans-1,2-Dichloroethene	U	30								
trans-1,3-Dichloropropene	U	30								
Trichloroethene	U	30								
Vinyl chloride	U	30								
Surr: 1,2-Dichloroethane-d4	*927.5*	0	*1000*	0	*92.8*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*952*	0	*1000*	0	*95.2*	*70-130*	0			
Surr: Dibromofluoromethane	*1018*	0	*1000*	0	*102*	*70-130*	0			
Surr: Toluene-d8	*998.5*	0	*1000*	0	*99.8*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84608** Instrument ID **VMS6** Method: **SW8260B**

LCS Sample ID: **LCS-84608-84608** Units: **µg/Kg-dry** Analysis Date: **4/12/2016 11:55 AM**
Client ID: Run ID: **VMS6_160412A** SeqNo: **3773818** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	1146	30	1000	0	115	70-135	0			
1,1,2,2-Tetrachloroethane	1134	30	1000	0	113	55-130	0			
1,1,2-Trichloroethane	1142	30	1000	0	114	60-125	0			
1,1-Dichloroethane	1032	30	1000	0	103	75-125	0			
1,1-Dichloroethene	973.5	30	1000	0	97.4	65-135	0			
1,2-Dichlorobenzene	1171	30	1000	0	117	75-120	0			
1,2-Dichloroethane	1083	30	1000	0	108	70-135	0			
1,2-Dichloropropane	1056	30	1000	0	106	70-120	0			
1,3-Dichlorobenzene	1200	30	1000	0	120	70-125	0			
1,4-Dichlorobenzene	1161	30	1000	0	116	70-125	0			
Acrylonitrile	849	100	1000	0	84.9	70-135	0			
Benzene	1161	30	1000	0	116	75-125	0			
Bromodichloromethane	1022	30	1000	0	102	70-130	0			
Bromoform	890	30	1000	0	89	55-135	0			
Bromomethane	1780	75	1000	0	178	30-160	0			S
Carbon tetrachloride	1092	30	1000	0	109	65-135	0			
Chlorobenzene	1162	30	1000	0	116	75-125	0			
Chloroethane	985.5	100	1000	0	98.6	40-155	0			
Chloroform	1028	30	1000	0	103	70-125	0			
Chloromethane	1212	100	1000	0	121	50-130	0			
cis-1,2-Dichloroethene	994.5	30	1000	0	99.4	65-125	0			
cis-1,3-Dichloropropene	1105	30	1000	0	110	70-125	0			
Dibromochloromethane	952.5	30	1000	0	95.2	65-135	0			
Ethylbenzene	1163	30	1000	0	116	75-125	0			
Methylene chloride	977.5	30	1000	0	97.8	55-145	0			
Tetrachloroethene	1214	30	1000	0	121	64-140	0			
Toluene	1123	30	1000	0	112	70-125	0			
trans-1,2-Dichloroethene	1020	30	1000	0	102	65-135	0			
trans-1,3-Dichloropropene	972.5	30	1000	0	97.2	65-125	0			
Trichloroethene	1065	30	1000	0	106	75-125	0			
Vinyl chloride	1029	30	1000	0	103	60-125	0			
Surr: 1,2-Dichloroethane-d4	*958*	0	*1000*	0	*95.8*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*986*	0	*1000*	0	*98.6*	*70-130*	0			
Surr: Dibromofluoromethane	*1034*	0	*1000*	0	*103*	*70-130*	0			
Surr: Toluene-d8	*990.5*	0	*1000*	0	*99*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84608** Instrument ID **VMS6** Method: **SW8260B**

MS	Sample ID: **1604566-01A MS**				Units: **µg/Kg-dry**		Analysis Date: **4/14/2016 08:57 PM**			
Client ID:		Run ID: **VMS9_160414A**			SeqNo: **3777539**		Prep Date: **4/12/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	1361	46	1532	0	88.8	70-135	0			
1,1,2,2-Tetrachloroethane	1575	46	1532	0	103	55-130	0			
1,1,2-Trichloroethane	1521	46	1532	0	99.3	60-125	0			
1,1-Dichloroethane	1349	46	1532	0	88	75-125	0			
1,1-Dichloroethene	1317	46	1532	0	86	65-135	0			
1,2-Dichlorobenzene	1436	46	1532	0	93.8	75-120	0			
1,2-Dichloroethane	1518	46	1532	0	99.1	70-135	0			
1,2-Dichloropropane	1484	46	1532	0	96.9	70-120	0			
1,3-Dichlorobenzene	1466	46	1532	0	95.7	70-125	0			
1,4-Dichlorobenzene	1439	46	1532	0	94	70-125	0			
Acrylonitrile	1650	150	1532	0	108	70-135	0			
Benzene	1404	46	1532	0	91.6	75-125	0			
Bromodichloromethane	1306	46	1532	0	85.2	70-130	0			
Bromoform	1361	46	1532	0	88.8	55-135	0			
Bromomethane	662.4	110	1532	0	43.2	30-160	0			
Carbon tetrachloride	1270	46	1532	0	83	65-135	0			
Chlorobenzene	1451	46	1532	0	94.8	75-125	0			
Chloroethane	779.6	150	1532	0	50.9	40-155	0			
Chloroform	1362	46	1532	0	88.9	70-125	0			
Chloromethane	1290	150	1532	0	84.2	50-130	0			
cis-1,2-Dichloroethene	1314	46	1532	0	85.8	65-125	0			
cis-1,3-Dichloropropene	1373	46	1532	0	89.6	70-125	0			
Dibromochloromethane	1251	46	1532	0	81.6	65-135	0			
Ethylbenzene	1415	46	1532	0	92.4	75-125	0			
Methylene chloride	1429	46	1532	0	93.3	55-145	0			
Tetrachloroethene	1990	46	1532	0	130	64-140	0			
Toluene	1378	46	1532	0	90	70-125	0			
trans-1,2-Dichloroethene	1339	46	1532	0	87.4	65-135	0			
trans-1,3-Dichloropropene	1202	46	1532	0	78.5	65-125	0			
Trichloroethene	1496	46	1532	0	97.7	75-125	0			
Vinyl chloride	1305	46	1532	0	85.2	60-125	0			
Surr: 1,2-Dichloroethane-d4	*1581*	0	*1532*	0	*103*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1637*	0	*1532*	0	*107*	*70-130*	0			
Surr: Dibromofluoromethane	*1529*	0	*1532*	0	*99.8*	*70-130*	0			
Surr: Toluene-d8	*1475*	0	*1532*	0	*96.3*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84608** Instrument ID **VMS6** Method: **SW8260B**

MSD	Sample ID: **1604566-01A MSD**				Units: **µg/Kg-dry**		Analysis Date: **4/14/2016 09:23 PM**			
Client ID:		Run ID: **VMS9_160414A**			SeqNo: **3777540**		Prep Date: **4/12/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	1412	46	1532	0	92.2	70-135	1361	3.7	30	
1,1,2,2-Tetrachloroethane	1585	46	1532	0	104	55-130	1575	0.63	30	
1,1,2-Trichloroethane	1521	46	1532	0	99.3	60-125	1521	0	30	
1,1-Dichloroethane	1440	46	1532	0	94	75-125	1349	6.54	30	
1,1-Dichloroethene	1472	46	1532	0	96.1	65-135	1317	11.1	30	
1,2-Dichlorobenzene	1536	46	1532	0	100	75-120	1436	6.75	30	
1,2-Dichloroethane	1545	46	1532	0	101	70-135	1518	1.75	30	
1,2-Dichloropropane	1544	46	1532	0	101	70-120	1484	3.95	30	
1,3-Dichlorobenzene	1570	46	1532	0	102	70-125	1466	6.86	30	
1,4-Dichlorobenzene	1520	46	1532	0	99.2	70-125	1439	5.49	30	
Acrylonitrile	1725	150	1532	0	113	70-135	1650	4.4	30	
Benzene	1483	46	1532	0	96.8	75-125	1404	5.47	30	
Bromodichloromethane	1363	46	1532	0	89	70-130	1306	4.3	30	
Bromoform	1344	46	1532	0	87.8	55-135	1361	1.25	30	
Bromomethane	794.9	110	1532	0	51.9	30-160	662.4	18.2	30	
Carbon tetrachloride	1306	46	1532	0	85.2	65-135	1270	2.73	30	
Chlorobenzene	1515	46	1532	0	98.9	75-125	1451	4.29	30	
Chloroethane	827.9	150	1532	0	54	40-155	779.6	6	30	
Chloroform	1495	46	1532	0	97.6	70-125	1362	9.33	30	
Chloromethane	1405	150	1532	0	91.8	50-130	1290	8.52	30	
cis-1,2-Dichloroethene	1404	46	1532	0	91.6	65-125	1314	6.59	30	
cis-1,3-Dichloropropene	1427	46	1532	0	93.2	70-125	1373	3.88	30	
Dibromochloromethane	1301	46	1532	0	85	65-135	1251	3.96	30	
Ethylbenzene	1494	46	1532	0	97.6	75-125	1415	5.42	30	
Methylene chloride	1532	46	1532	0	100	55-145	1429	6.98	30	
Tetrachloroethene	2331	46	1532	0	152	64-140	1990	15.8	30	S
Toluene	1467	46	1532	0	95.8	70-125	1378	6.25	30	
trans-1,2-Dichloroethene	1460	46	1532	0	95.3	65-135	1339	8.59	30	
trans-1,3-Dichloropropene	1280	46	1532	0	83.6	65-125	1202	6.23	30	
Trichloroethene	1568	46	1532	0	102	75-125	1496	4.65	30	
Vinyl chloride	1507	46	1532	0	98.4	60-125	1305	14.4	30	
Surr: 1,2-Dichloroethane-d4	*1509*	0	*1532*	0	*98.6*	*70-130*	1581	*4.61*	*30*	
Surr: 4-Bromofluorobenzene	*1621*	0	*1532*	0	*106*	*70-130*	1637	*0.987*	*30*	
Surr: Dibromofluoromethane	*1431*	0	*1532*	0	*93.4*	*70-130*	1529	*6.57*	*30*	
Surr: Toluene-d8	*1462*	0	*1532*	0	*95.4*	*70-130*	1475	*0.887*	*30*	

The following samples were analyzed in this batch: 1604561-01A 1604561-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **R185467B** Instrument ID **VMS10** Method: **SW8260B**

MBLK	Sample ID: **VBLKW1-160415-R185467B**				Units: **µg/L**			Analysis Date: **4/15/2016 02:41 PM**		
Client ID:		Run ID: **VMS10_160415A**			SeqNo: **3780106**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	U	1.0								
1,1,2,2-Tetrachloroethane	U	1.0								
1,1,2-Trichloroethane	U	1.0								
1,1-Dichloroethane	U	1.0								
1,1-Dichloroethene	U	1.0								
1,2-Dichlorobenzene	U	1.0								
1,2-Dichloroethane	U	1.0								
1,2-Dichloropropane	U	1.0								
1,3-Dichlorobenzene	U	1.0								
1,4-Dichlorobenzene	U	1.0								
Acrolein	U	10								
Acrylonitrile	U	1.0								
Benzene	U	1.0								
Bromodichloromethane	U	1.0								
Bromoform	U	1.0								
Bromomethane	U	1.0								
Carbon tetrachloride	U	1.0								
Chlorobenzene	U	1.0								
Chloroethane	U	1.0								
Chloroform	U	1.0								
Chloromethane	U	1.0								
cis-1,3-Dichloropropene	U	1.0								
Dibromochloromethane	U	1.0								
Methylene chloride	U	5.0								
Tetrachloroethene	U	1.0								
Toluene	U	1.0								
trans-1,2-Dichloroethene	U	1.0								
trans-1,3-Dichloropropene	U	1.0								
Trichloroethene	U	1.0								
Vinyl chloride	U	1.0								
Surr: 1,2-Dichloroethane-d4	*19.84*	0	*20*	0	*99.2*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*18.45*	0	*20*	0	*92.2*	*80-110*	0			
Surr: Dibromofluoromethane	*18.53*	0	*20*	0	*92.6*	*85-115*	0			
Surr: Toluene-d8	*19.47*	0	*20*	0	*97.4*	*85-110*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **R185467B** Instrument ID **VMS10** Method: **SW8260B**

LCS	Sample ID: **VLCSW1-160415-R185467B**				Units: **µg/L**			Analysis Date: **4/15/2016 01:28 PM**		
Client ID:		Run ID: **VMS10_160415A**			SeqNo: **3780105**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	18.47	1.0	20	0	92.4	75-130	0			
1,1,2,2-Tetrachloroethane	19.89	1.0	20	0	99.4	75-130	0			
1,1,2-Trichloroethane	19.06	1.0	20	0	95.3	75-125	0			
1,1-Dichloroethane	21.47	1.0	20	0	107	75-133	0			
1,1-Dichloroethene	20.53	1.0	20	0	103	70-145	0			
1,2-Dichlorobenzene	20.38	1.0	20	0	102	70-130	0			
1,2-Dichloroethane	20.17	1.0	20	0	101	78-125	0			
1,2-Dichloropropane	20.15	1.0	20	0	101	75-125	0			
1,3-Dichlorobenzene	21.65	1.0	20	0	108	75-130	0			
1,4-Dichlorobenzene	20.3	1.0	20	0	102	75-130	0			
Acrylonitrile	17.02	1.0	20	0	85.1	60-140	0			
Benzene	20.68	1.0	20	0	103	85-125	0			
Bromodichloromethane	16.63	1.0	20	0	83.2	75-125	0			
Bromoform	13.24	1.0	20	0	66.2	60-125	0			
Bromomethane	30.08	1.0	20	0	150	30-185	0			
Carbon tetrachloride	17.81	1.0	20	0	89	65-140	0			
Chlorobenzene	21.12	1.0	20	0	106	80-120	0			
Chloroethane	20.88	1.0	20	0	104	50-140	0			
Chloroform	20.14	1.0	20	0	101	80-130	0			
Chloromethane	16.66	1.0	20	0	83.3	50-130	0			
cis-1,3-Dichloropropene	17.37	1.0	20	0	86.8	70-130	0			
Dibromochloromethane	16.57	1.0	20	0	82.8	60-115	0			
Methylene chloride	20.82	5.0	20	0	104	75-140	0			
Tetrachloroethene	21.51	1.0	20	0	108	77-138	0			
Toluene	21.05	1.0	20	0	105	85-125	0			
trans-1,2-Dichloroethene	21.39	1.0	20	0	107	80-140	0			
trans-1,3-Dichloropropene	16.28	1.0	20	0	81.4	81-123	0			
Trichloroethene	20.14	1.0	20	0	101	84-130	0			
Vinyl chloride	20.17	1.0	20	0	101	50-136	0			
Surr: 1,2-Dichloroethane-d4	*19.76*	0	*20*	0	*98.8*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*19.13*	0	*20*	0	*95.6*	*80-110*	0			
Surr: Dibromofluoromethane	*20.19*	0	*20*	0	*101*	*85-115*	0			
Surr: Toluene-d8	*19.85*	0	*20*	0	*99.2*	*85-110*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **R185467B** Instrument ID **VMS10** Method: **SW8260B**

MS Sample ID: **1604806-04I MS** Units: **µg/L** Analysis Date: **4/15/2016 10:11 PM**
Client ID: Run ID: **VMS10_160415A** SeqNo: **3780109** Prep Date: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	156	10	200	0	78	75-130	0			
1,1,2,2-Tetrachloroethane	170.1	10	200	0	85	75-130	0			
1,1,2-Trichloroethane	158.8	10	200	0	79.4	75-125	0			
1,1-Dichloroethane	183.9	10	200	0	92	75-133	0			
1,1-Dichloroethene	186.2	10	200	0	93.1	70-145	0			
1,2-Dichlorobenzene	159.5	10	200	0	79.8	70-130	0			
1,2-Dichloroethane	165.9	10	200	0	83	78-125	0			
1,2-Dichloropropane	163.9	10	200	0	82	75-125	0			
1,3-Dichlorobenzene	168.7	10	200	0	84.4	75-130	0			
1,4-Dichlorobenzene	158.1	10	200	0	79	75-130	0			
Acrylonitrile	173.6	10	200	0	86.8	60-140	0			
Benzene	192.4	10	200	19.7	86.4	85-125	0			
Bromodichloromethane	131.1	10	200	0	65.6	75-125	0			S
Bromoform	104.6	10	200	0	52.3	60-125	0			S
Bromomethane	231.2	10	200	0	116	30-185	0			
Carbon tetrachloride	140.2	10	200	0	70.1	65-140	0			
Chlorobenzene	170.6	10	200	0	85.3	80-120	0			
Chloroethane	181.8	10	200	0	90.9	50-140	0			
Chloroform	168.1	10	200	0	84	80-130	0			
Chloromethane	143.8	10	200	0	71.9	50-130	0			
cis-1,3-Dichloropropene	133.4	10	200	0	66.7	70-130	0			S
Dibromochloromethane	124.4	10	200	0	62.2	60-115	0			
Methylene chloride	178.1	50	200	0	89	75-140	0			
Tetrachloroethene	176.7	10	200	0	88.4	77-138	0			
Toluene	176.7	10	200	4.3	86.2	85-125	0			
trans-1,2-Dichloroethene	185.7	10	200	0	92.8	80-140	0			
trans-1,3-Dichloropropene	124.1	10	200	0	62	81-123	0			S
Trichloroethene	162.4	10	200	0	81.2	84-130	0			S
Vinyl chloride	179.2	10	200	0	89.6	50-136	0			
Surr: 1,2-Dichloroethane-d4	*196.1*	0	*200*	0	*98*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*193.9*	0	*200*	0	*97*	*80-110*	0			
Surr: Dibromofluoromethane	*200*	0	*200*	0	*100*	*85-115*	0			
Surr: Toluene-d8	*199.3*	0	*200*	0	*99.6*	*85-110*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **R185467B** Instrument ID **VMS10** Method: **SW8260B**

MSD Sample ID: **1604806-04I MSD** Units: **µg/L** Analysis Date: **4/15/2016 10:35 PM**
Client ID: Run ID: **VMS10_160415A** SeqNo: **3780110** Prep Date: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	209	10	200	0	104	75-130	156	29	30	
1,1,2,2-Tetrachloroethane	238.7	10	200	0	119	75-130	170.1	33.6	30	R
1,1,2-Trichloroethane	220.1	10	200	0	110	75-125	158.8	32.4	30	R
1,1-Dichloroethane	240.4	10	200	0	120	75-133	183.9	26.6	30	
1,1-Dichloroethene	237.6	10	200	0	119	70-145	186.2	24.3	30	
1,2-Dichlorobenzene	218.8	10	200	0	109	70-130	159.5	31.4	30	R
1,2-Dichloroethane	218	10	200	0	109	78-125	165.9	27.1	30	
1,2-Dichloropropane	219.9	10	200	0	110	75-125	163.9	29.2	30	
1,3-Dichlorobenzene	227.2	10	200	0	114	75-130	168.7	29.6	30	
1,4-Dichlorobenzene	212.6	10	200	0	106	75-130	158.1	29.4	30	
Acrylonitrile	236.5	10	200	0	118	60-140	173.6	30.7	30	R
Benzene	248	10	200	19.7	114	85-125	192.4	25.2	30	
Bromodichloromethane	179.9	10	200	0	90	75-125	131.1	31.4	30	R
Bromoform	148.9	10	200	0	74.4	60-125	104.6	35	30	R
Bromomethane	303.4	10	200	0	152	30-185	231.2	27	30	
Carbon tetrachloride	193.7	10	200	0	96.8	65-140	140.2	32	30	R
Chlorobenzene	228	10	200	0	114	80-120	170.6	28.8	30	
Chloroethane	233.9	10	200	0	117	50-140	181.8	25.1	30	
Chloroform	220.6	10	200	0	110	80-130	168.1	27	30	
Chloromethane	182.5	10	200	0	91.2	50-130	143.8	23.7	30	
cis-1,3-Dichloropropene	182.4	10	200	0	91.2	70-130	133.4	31	30	R
Dibromochloromethane	178.7	10	200	0	89.4	60-115	124.4	35.8	30	R
Methylene chloride	233.8	50	200	0	117	75-140	178.1	27	30	
Tetrachloroethene	234.6	10	200	0	117	77-138	176.7	28.2	30	
Toluene	233.7	10	200	4.3	115	85-125	176.7	27.8	30	
trans-1,2-Dichloroethene	239	10	200	0	120	80-140	185.7	25.1	30	
trans-1,3-Dichloropropene	175.5	10	200	0	87.8	81-123	124.1	34.3	30	R
Trichloroethene	217.7	10	200	0	109	84-130	162.4	29.1	30	
Vinyl chloride	229.1	10	200	0	115	50-136	179.2	24.4	30	
Surr: 1,2-Dichloroethane-d4	*193.8*	0	*200*	0	*96.9*	*75-120*	196.1	*1.18*	*30*	
Surr: 4-Bromofluorobenzene	*193.4*	0	*200*	0	*96.7*	*80-110*	193.9	*0.258*	*30*	
Surr: Dibromofluoromethane	*196.2*	0	*200*	0	*98.1*	*85-115*	200	*1.92*	*30*	
Surr: Toluene-d8	*198.6*	0	*200*	0	*99.3*	*85-110*	199.3	*0.352*	*30*	

The following samples were analyzed in this batch: 1604561-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84616** Instrument ID **LACHAT** Method: **A4500-NH3 G-97**

MBLK Sample ID: **MBLK-84616-84616** Units: **mg/Kg** Analysis Date: **4/13/2016 09:41 AM**
Client ID: Run ID: **LACHAT_160413B** SeqNo: **3773878** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	U	5.0								

LCS Sample ID: **LCS-84616-84616** Units: **mg/Kg** Analysis Date: **4/13/2016 09:41 AM**
Client ID: Run ID: **LACHAT_160413B** SeqNo: **3773879** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	99.26	5.0	100	0	99.3	80-120	0			

MS Sample ID: **1604279-01A MS** Units: **mg/Kg** Analysis Date: **4/13/2016 09:41 AM**
Client ID: Run ID: **LACHAT_160413B** SeqNo: **3773881** Prep Date: **4/12/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	2498	76	152.9	1906	388	75-125	0			SO

MSD Sample ID: **1604279-01A MSD** Units: **mg/Kg** Analysis Date: **4/13/2016 09:41 AM**
Client ID: Run ID: **LACHAT_160413B** SeqNo: **3773882** Prep Date: **4/12/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	2376	76	151.5	1906	310	75-125	2498	5.04	35	SO

LCS2 Sample ID: **LCS2-84616-84616** Units: **mg/Kg** Analysis Date: **4/13/2016 09:41 AM**
Client ID: Run ID: **LACHAT_160413B** SeqNo: **3773887** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	99.38	5.0	100	0	99.4	80-120	0			

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84622** Instrument ID **WETCHEM** Method: **SW9045D**

LCS Sample ID: **LCS-84622-84622** Units: **s.u.** Analysis Date: **4/12/2016 04:00 PM**
Client ID: Run ID: **WETCHEM_160412L** SeqNo: **3772699** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	3.99	0	4	0	99.8	90-110	0			

DUP Sample ID: **1604573-01A DUP** Units: **s.u.** Analysis Date: **4/12/2016 04:00 PM**
Client ID: Run ID: **WETCHEM_160412L** SeqNo: **3772703** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	7.03	0	0	0	0	0-0	7.12	1.27	20	H

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84636** Instrument ID **WETCHEM** Method: **A5210B-01**

MBLK Sample ID: **MBLK-84636-84636** Units: **mg/L** Analysis Date: **4/17/2016 11:30 AM**
Client ID: Run ID: **WETCHEM_160417A** SeqNo: **3778680** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	U	2.0								

LCS Sample ID: **LCS-84636-84636** Units: **mg/L** Analysis Date: **4/17/2016 11:30 AM**
Client ID: Run ID: **WETCHEM_160417A** SeqNo: **3778681** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	177.2	2.0	198	0	89.5	85-115	0			

DUP Sample ID: **1604085-11C DUP** Units: **mg/L** Analysis Date: **4/17/2016 11:30 AM**
Client ID: Run ID: **WETCHEM_160417A** SeqNo: **3778685** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	277.2	2.0	0	0	0	0-0	265.6	4.27	20	

The following samples were analyzed in this batch: 1604561-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84665** Instrument ID **WETCHEM** Method: **A4500-NO2 B**

MBLK Sample ID: **MBLK-84665-84665** Units: **mg/Kg** Analysis Date: **4/13/2016 02:00 PM**
Client ID: Run ID: **WETCHEM_160413M** SeqNo: **3774723** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	U	0.70								

LCS Sample ID: **LCS-84665-84665** Units: **mg/Kg** Analysis Date: **4/13/2016 02:00 PM**
Client ID: Run ID: **WETCHEM_160413M** SeqNo: **3774724** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	2.181	0.70	2	0	109	80-120	0			

MS Sample ID: **1604561-01C MS** Units: **mg/Kg** Analysis Date: **4/13/2016 02:00 PM**
Client ID: **RCK001:D-2: S000130** Run ID: **WETCHEM_160413M** SeqNo: **3774726** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	1.611	0.61	1.742	0.008212	92	75-125	0			

MSD Sample ID: **1604561-01C MSD** Units: **mg/Kg** Analysis Date: **4/13/2016 02:00 PM**
Client ID: **RCK001:D-2: S000130** Run ID: **WETCHEM_160413M** SeqNo: **3774727** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	1.552	0.61	1.73	0.008212	89.2	75-125	1.611	3.71	20	

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84666** Instrument ID **LACHAT2** Method: **E353.2**

MBLK Sample ID: **MBLK-84666-84666** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413H** SeqNo: **3775353** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	U	1.0								

LCS Sample ID: **LCS-84666-84666** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413H** SeqNo: **3775354** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	52.01	1.0	50	0	104	80-120	0			

MS Sample ID: **1604561-01C MS** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: **RCK001:D-2: S000130** Run ID: **LACHAT2_160413H** SeqNo: **3775356** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	47.94	0.92	46.04	0	104	75-125	0			

MSD Sample ID: **1604561-01C MSD** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: **RCK001:D-2: S000130** Run ID: **LACHAT2_160413H** SeqNo: **3775357** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	45.15	0.88	44.09	0	102	75-125	47.94	5.99	35	

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84667** Instrument ID **LACHAT2** Method: **E353.2**

MBLK Sample ID: **MBLK-84667-84667** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413I** SeqNo: **3775370** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	U	1.0								

LCS Sample ID: **LCS-84667-84667** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413I** SeqNo: **3775371** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	51.27	1.0	50	0	103	80-120	0			

MS Sample ID: **1604561-01C MS** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: **RCK001:D-2: S000130** Run ID: **LACHAT2_160413I** SeqNo: **3775373** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	45.56	0.92	46.04	0	99	75-125	0			

MSD Sample ID: **1604561-01C MSD** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: **RCK001:D-2: S000130** Run ID: **LACHAT2_160413I** SeqNo: **3775374** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	44.91	0.88	44.09	0	102	75-125	45.56	1.44	35	

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84716** Instrument ID **LACHAT2** Method: **A4500-P E-97**

MBLK Sample ID: **MBLK-84716-84716** Units: **mg/Kg** Analysis Date: **4/14/2016 01:21 PM**
Client ID: Run ID: **LACHAT2_160414D** SeqNo: **3776983** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	U	1.0								

LCS Sample ID: **LCS-84716-84716** Units: **mg/Kg** Analysis Date: **4/14/2016 01:21 PM**
Client ID: Run ID: **LACHAT2_160414D** SeqNo: **3776984** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	9.535	1.0	10	0	95.4	90-110	0			

MS Sample ID: **1604561-01C MS** Units: **mg/Kg** Analysis Date: **4/14/2016 01:21 PM**
Client ID: **RCK001:D-2: S000130** Run ID: **LACHAT2_160414D** SeqNo: **3776986** Prep Date: **4/14/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	17.42	1.7	8.666	10.51	79.7	90-110	0			S

MSD Sample ID: **1604561-01C MSD** Units: **mg/Kg** Analysis Date: **4/14/2016 01:21 PM**
Client ID: **RCK001:D-2: S000130** Run ID: **LACHAT2_160414D** SeqNo: **3776987** Prep Date: **4/14/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	18.1	1.7	8.621	10.51	88	90-110	17.42	3.86	20	S

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84717** Instrument ID **LACHAT2** Method: **E365.1 R2.0**

MBLK Sample ID: **MBLK-84717-84717** Units: **mg/Kg** Analysis Date: **4/14/2016 11:38 AM**
Client ID: Run ID: **LACHAT2_160414C** SeqNo: **3776963** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	U	5.0								

LCS Sample ID: **LCS-84717-84717** Units: **mg/Kg** Analysis Date: **4/14/2016 11:38 AM**
Client ID: Run ID: **LACHAT2_160414C** SeqNo: **3776964** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	10.36	5.0	10	0	104	90-110	0			

MS Sample ID: **1604561-01C MS** Units: **mg/Kg** Analysis Date: **4/14/2016 11:38 AM**
Client ID: **RCK001:D-2: S000130** Run ID: **LACHAT2_160414C** SeqNo: **3776968** Prep Date: **4/14/2016** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	518.7	360	14.58	531.5	-87.8	90-110	0			SO

MSD Sample ID: **1604561-01C MSD** Units: **mg/Kg** Analysis Date: **4/14/2016 11:38 AM**
Client ID: **RCK001:D-2: S000130** Run ID: **LACHAT2_160414C** SeqNo: **3776969** Prep Date: **4/14/2016** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	528.3	350	14.16	531.5	-22	90-110	518.7	1.85	20	SO

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84721** Instrument ID **LACHAT** Method: **SW9012B**

MBLK Sample ID: **MBLK-84721-84721** Units: **mg/Kg** Analysis Date: **4/14/2016 09:54 AM**
Client ID: Run ID: **LACHAT_160414D** SeqNo: **3776323** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	U	0.50								

MBLK Sample ID: **MBLK-84721-84721** Units: **mg/Kg** Analysis Date: **4/14/2016 09:54 AM**
Client ID: Run ID: **LACHAT_160414D** SeqNo: **3776331** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	U	0.50								

LCS Sample ID: **LCS-84721-84721** Units: **mg/Kg** Analysis Date: **4/14/2016 09:54 AM**
Client ID: Run ID: **LACHAT_160414D** SeqNo: **3776324** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.321	0.50	2.5	0	92.8	85-119	0			

LCS Sample ID: **LCS-84721-84721** Units: **mg/Kg** Analysis Date: **4/14/2016 09:54 AM**
Client ID: Run ID: **LACHAT_160414D** SeqNo: **3776332** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.321	0.50	2.5	0	92.8	85-119	0			

MS Sample ID: **1604343-01A MS** Units: **mg/Kg** Analysis Date: **4/14/2016 09:54 AM**
Client ID: Run ID: **LACHAT_160414D** SeqNo: **3776334** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.032	0.50	2.5	0.3915	65.6	70-130	0			S

MSD Sample ID: **1604343-01A MSD** Units: **mg/Kg** Analysis Date: **4/14/2016 09:54 AM**
Client ID: Run ID: **LACHAT_160414D** SeqNo: **3776335** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.155	0.50	2.51	0.3915	70.2	70-130	2.032	5.86	30	

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84766** Instrument ID **LACHAT2** Method: **A4500-NH3 G-97**

MBLK Sample ID: **MBLK-84766-84766** Units: **mg NH3-N/Kg** Analysis Date: **4/15/2016 10:19 AM**
Client ID: Run ID: **LACHAT2_160415F** SeqNo: **3778489** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	U	15								

LCS Sample ID: **LCS-84766-84766** Units: **mg NH3-N/Kg** Analysis Date: **4/15/2016 10:19 AM**
Client ID: Run ID: **LACHAT2_160415F** SeqNo: **3778490** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	41.32	15	50	0	82.6	70-130	0			

MS Sample ID: **1604561-02C MS** Units: **mg NH3-N/Kg** Analysis Date: **4/15/2016 10:19 AM**
Client ID: **RCK001:D-3: S000090** Run ID: **LACHAT2_160415F** SeqNo: **3778493** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	37.95	9.7	32.47	15.45	69.3	70-130	0			S

MSD Sample ID: **1604561-02C MSD** Units: **mg NH3-N/Kg** Analysis Date: **4/15/2016 10:19 AM**
Client ID: **RCK001:D-3: S000090** Run ID: **LACHAT2_160415F** SeqNo: **3778494** Prep Date: **4/14/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	44.84	9.5	31.65	15.45	92.9	70-130	37.95	16.6	30	

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **84830** Instrument ID **LACHAT** Method: **SW9012B**

MBLK Sample ID: **MBLK-84830-84830** Units: **mg/L** Analysis Date: **4/18/2016 02:17 PM**
Client ID: Run ID: **LACHAT_160418D** SeqNo: **3780507** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	U	0.0050								

MBLK Sample ID: **MBLK-84830-84830** Units: **mg/L** Analysis Date: **4/18/2016 02:17 PM**
Client ID: Run ID: **LACHAT_160418D** SeqNo: **3780535** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	U	0.0050								

LCS Sample ID: **LCS-84830-84830** Units: **mg/L** Analysis Date: **4/18/2016 02:17 PM**
Client ID: Run ID: **LACHAT_160418D** SeqNo: **3780508** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	0.2518	0.0050	0.25	0	101	82-122	0			

LCS Sample ID: **LCS-84830-84830** Units: **mg/L** Analysis Date: **4/18/2016 02:17 PM**
Client ID: Run ID: **LACHAT_160418D** SeqNo: **3780536** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	0.2518	0.0050	0.25	0	101	80-120	0			

MS Sample ID: **1604733-01C MS** Units: **mg/L** Analysis Date: **4/18/2016 02:17 PM**
Client ID: Run ID: **LACHAT_160418D** SeqNo: **3780511** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	0.246	0.0050	0.25	0	98.4	70-130	0			

MS Sample ID: **1604740-01D MS** Units: **mg/L** Analysis Date: **4/18/2016 02:17 PM**
Client ID: Run ID: **LACHAT_160418D** SeqNo: **3780524** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	0.2509	0.0050	0.25	0	100	70-130	0			

MSD Sample ID: **1604733-01C MSD** Units: **mg/L** Analysis Date: **4/18/2016 02:17 PM**
Client ID: Run ID: **LACHAT_160418D** SeqNo: **3780512** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	0.2478	0.0050	0.25	0	99.1	70-130	0.246	0.729	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84830** Instrument ID **LACHAT** Method: **SW9012B**

MSD	Sample ID: **1604740-01D MSD**				Units: **mg/L**			Analysis Date: **4/18/2016 02:17 PM**			
Client ID:		Run ID: **LACHAT_160418D**			SeqNo: **3780525**			Prep Date: **4/18/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
Cyanide, Total	0.232	0.0050	0.25	0	92.8	70-130	0.2509	7.83	30		

The following samples were analyzed in this batch: 1604561-03E

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84831** Instrument ID **WETCHEM** Method: **A5210B-97**

MBLK Sample ID: **MBLK-84831-84831** Units: **mg/Kg** Analysis Date: **4/17/2016 11:30 AM**
Client ID: Run ID: **WETCHEM_160417A** SeqNo: **3779648** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	U	20								

LCS Sample ID: **LCS-84831-84831** Units: **mg/Kg** Analysis Date: **4/17/2016 11:30 AM**
Client ID: Run ID: **WETCHEM_160417A** SeqNo: **3779649** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	1772	20	1980	0	89.5	85-115	0			

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84838** Instrument ID **LACHAT** Method: **A4500-NH3 G-97**

MBLK Sample ID: **MBLK-84838-84838** Units: **mg/L** Analysis Date: **4/19/2016 12:32 PM**
Client ID: Run ID: **LACHAT_160419B** SeqNo: **3782678** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	U	1.0								

LCS Sample ID: **LCS-84838-84838** Units: **mg/L** Analysis Date: **4/19/2016 12:32 PM**
Client ID: Run ID: **LACHAT_160419B** SeqNo: **3782679** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	10.03	1.0	10	0	100	90-110	0			

MS Sample ID: **1604561-03C MS** Units: **mg/L** Analysis Date: **4/19/2016 12:32 PM**
Client ID: **RCK001:FB-1: W041116** Run ID: **LACHAT_160419B** SeqNo: **3782681** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	7.845	1.0	10	0.03542	78.1	75-125	0			

MSD Sample ID: **1604561-03C MSD** Units: **mg/L** Analysis Date: **4/19/2016 12:32 PM**
Client ID: **RCK001:FB-1: W041116** Run ID: **LACHAT_160419B** SeqNo: **3782682** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	8.46	1.0	10	0.03542	84.2	75-125	7.845	7.54	30	

LCS2 Sample ID: **LCS2-84838-84838** Units: **mg/L** Analysis Date: **4/19/2016 12:32 PM**
Client ID: Run ID: **LACHAT_160419B** SeqNo: **3782687** Prep Date: **4/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	10.24	1.0	10	0	102	90-110	0			

The following samples were analyzed in this batch: 1604561-03C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84873** Instrument ID **GALLERY** Method: **A4500-Cl E-97**

MBLK	Sample ID: **MBLK-84873-84873**				Units: **mg/Kg**			Analysis Date: **4/19/2016 12:50 PM**		
Client ID:	Run ID: **GALLERY_160419A**			SeqNo: **3783194**		Prep Date: **4/18/2016**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	10								

MS	Sample ID: **1604789-05B MS**				Units: **mg/Kg**			Analysis Date: **4/19/2016 12:50 PM**		
Client ID:	Run ID: **GALLERY_160419A**			SeqNo: **3783199**		Prep Date: **4/18/2016**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	882.6	10	499	378	101	75-125	0			

MSD	Sample ID: **1604789-05B MSD**				Units: **mg/Kg**			Analysis Date: **4/19/2016 12:50 PM**		
Client ID:	Run ID: **GALLERY_160419A**			SeqNo: **3783200**		Prep Date: **4/18/2016**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	882.4	9.9	497	378	101	75-125	882.6	0.026	25	

LCS1	Sample ID: **LCS1-84873-84873**				Units: **mg/Kg**			Analysis Date: **4/19/2016 12:50 PM**		
Client ID:	Run ID: **GALLERY_160419A**			SeqNo: **3783201**		Prep Date: **4/18/2016**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	107.2	10	100	0	107	80-120	0			

LCS2	Sample ID: **LCS2-84873-84873**				Units: **mg/Kg**			Analysis Date: **4/19/2016 12:50 PM**		
Client ID:	Run ID: **GALLERY_160419A**			SeqNo: **3783202**		Prep Date: **4/18/2016**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	528.5	10	500	0	106	80-120	0			

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **84913** Instrument ID **WETCHEM** Method: **E410.4 R2.0**

MBLK Sample ID: **MBLK-84913-84913** Units: **mg/Kg** Analysis Date: **4/19/2016 09:55 AM**
Client ID: Run ID: **WETCHEM_160419H** SeqNo: **3782799** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	U	500								

LCS Sample ID: **LCS-84913-84913** Units: **mg/Kg** Analysis Date: **4/19/2016 09:55 AM**
Client ID: Run ID: **WETCHEM_160419H** SeqNo: **3782800** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	6322	500	6000	0	105	90-110	0			

MS Sample ID: **1604561-01C MS** Units: **mg/Kg** Analysis Date: **4/19/2016 09:55 AM**
Client ID: **RCK001:D-2: S000130** Run ID: **WETCHEM_160419H** SeqNo: **3782805** Prep Date: **4/15/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	5916	920	5495	152	105	80-120	0			

MSD Sample ID: **1604561-01C MSD** Units: **mg/Kg** Analysis Date: **4/19/2016 09:55 AM**
Client ID: **RCK001:D-2: S000130** Run ID: **WETCHEM_160419H** SeqNo: **3782806** Prep Date: **4/15/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	5832	900	5376	152	106	80-120	5916	1.43	20	

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **R185203b** Instrument ID **Titrator 1** Method: **SW9040C**

LCS Sample ID: **WLCSW1-160412-R185203b** Units: **s.u.** Analysis Date: **4/12/2016 01:40 PM**
Client ID: Run ID: **TITRATOR 1_160412A** SeqNo: **3772009** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH (laboratory)	4.14	0	4.4	0	94.1	90-110	0			

DUP Sample ID: **1604313-15A DUP** Units: **s.u.** Analysis Date: **4/12/2016 01:40 PM**
Client ID: Run ID: **TITRATOR 1_160412A** SeqNo: **3772011** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH (laboratory)	9.29	0	0	0	0		9.32	0.322	20	

The following samples were analyzed in this batch: 1604561-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **R185215** Instrument ID **LACHAT2** Method: **A4500-P E-99**

MBLK Sample ID: **MBLK-R185215** Units: **mg/L** Analysis Date: **4/12/2016 02:05 PM**
Client ID: Run ID: **LACHAT2_160412D** SeqNo: **3772202** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	U	0.050								

LCS Sample ID: **LCS-R185215** Units: **mg/L** Analysis Date: **4/12/2016 02:05 PM**
Client ID: Run ID: **LACHAT2_160412D** SeqNo: **3772203** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	0.9786	0.050	1	0	97.9	90-110	0			

MS Sample ID: **1604561-03B MS** Units: **mg/L** Analysis Date: **4/12/2016 02:05 PM**
Client ID: **RCK001:FB-1: W041116** Run ID: **LACHAT2_160412D** SeqNo: **3772205** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	1.046	0.050	1	0.02386	102	90-110	0			

MSD Sample ID: **1604561-03B MSD** Units: **mg/L** Analysis Date: **4/12/2016 02:05 PM**
Client ID: **RCK001:FB-1: W041116** Run ID: **LACHAT2_160412D** SeqNo: **3772206** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	1.076	0.050	1	0.02386	105	90-110	1.046	2.83	20	

The following samples were analyzed in this batch: 1604561-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **R185265** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R185265** Units: **% of sample** Analysis Date: **4/12/2016 04:48 PM**
Client ID: Run ID: **MOIST_160412A** SeqNo: **3773712** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	U	0.050								

LCS Sample ID: **LCS-R185265** Units: **% of sample** Analysis Date: **4/12/2016 04:48 PM**
Client ID: Run ID: **MOIST_160412A** SeqNo: **3773711** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1604469-01A DUP** Units: **% of sample** Analysis Date: **4/12/2016 04:48 PM**
Client ID: Run ID: **MOIST_160412A** SeqNo: **3773690** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	24.54	0.050	0	0	0		25.22	2.73	20	

DUP Sample ID: **1604552-01A DUP** Units: **% of sample** Analysis Date: **4/12/2016 04:48 PM**
Client ID: Run ID: **MOIST_160412A** SeqNo: **3773702** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	30.61	0.050	0	0	0		29.92	2.28	20	

The following samples were analyzed in this batch: 1604561-01B 1604561-02B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **R185282** Instrument ID **WETCHEM** Method: **TITRAMETRIC**

MBLK Sample ID: **WBLKS1-160413-R185282** Units: **% by wt** Analysis Date: **4/13/2016 10:20 AM**
Client ID: Run ID: **WETCHEM_160413D** SeqNo: **3774130** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	U	0.025								

LCS Sample ID: **WLCSS1-160413-R185282** Units: **% by wt** Analysis Date: **4/13/2016 10:20 AM**
Client ID: Run ID: **WETCHEM_160413D** SeqNo: **3774131** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	0.1034	0.025	0.1	0	103	70-110	0			

MS Sample ID: **1604500-01C MS** Units: **% by wt** Analysis Date: **4/13/2016 10:20 AM**
Client ID: Run ID: **WETCHEM_160413D** SeqNo: **3774184** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	0.7158	0.025	0.4219	0.2796	103	70-110	0			

MSD Sample ID: **1604500-01C MSD** Units: **% by wt** Analysis Date: **4/13/2016 10:20 AM**
Client ID: Run ID: **WETCHEM_160413D** SeqNo: **3774185** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	0.7323	0.025	0.4149	0.2796	109	70-110	0.7158	2.27	20	

The following samples were analyzed in this batch: 1604561-01C 1604561-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **R185299A** Instrument ID **LACHAT2** Method: **A4500-NH3 G-97**

MBLK	Sample ID: **MBLK-R185299A**					Units: **mg NH3-N/L**			Analysis Date: **4/13/2016 10:32 AM**
Client ID:		Run ID: **LACHAT2_160413A**			SeqNo: **3774533**	Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	U	0.020								

LCS	Sample ID: **LCS-R185299A**					Units: **mg NH3-N/L**			Analysis Date: **4/13/2016 10:32 AM**
Client ID:		Run ID: **LACHAT2_160413A**			SeqNo: **3774534**	Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	1.02	0.020	1	0	102	80-120	0			

MS	Sample ID: **1604531-01C MS**					Units: **mg NH3-N/L**			Analysis Date: **4/13/2016 10:32 AM**
Client ID:		Run ID: **LACHAT2_160413A**			SeqNo: **3774541**	Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	1.032	0.020	1	0.03411	99.8	75-125	0			

MS	Sample ID: **1604581-01B MS**					Units: **mg NH3-N/L**			Analysis Date: **4/13/2016 10:32 AM**
Client ID:		Run ID: **LACHAT2_160413A**			SeqNo: **3774565**	Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	1.003	0.020	1	0.02329	98	75-125	0			

MSD	Sample ID: **1604531-01C MSD**					Units: **mg NH3-N/L**			Analysis Date: **4/13/2016 10:32 AM**
Client ID:		Run ID: **LACHAT2_160413A**			SeqNo: **3774542**	Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	1.029	0.020	1	0.03411	99.5	75-125	1.032	0.291	25	

MSD	Sample ID: **1604581-01B MSD**					Units: **mg NH3-N/L**			Analysis Date: **4/13/2016 10:32 AM**
Client ID:		Run ID: **LACHAT2_160413A**			SeqNo: **3774566**	Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	1.005	0.020	1	0.02329	98.2	75-125	1.003	0.199	25	

The following samples were analyzed in this batch: 1604561-03C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **R185326A** Instrument ID **LACHAT2** Method: **E353.2 R2.0**

MBLK	Sample ID: **MBLK-R185326A**			Units: **mg/L**			Analysis Date: **4/13/2016 11:59 AM**			
Client ID:	Run ID: **LACHAT2_160413B**			SeqNo: **3774957**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	U	0.020								

LCS	Sample ID: **LCS-R185326A**			Units: **mg/L**			Analysis Date: **4/13/2016 11:59 AM**			
Client ID:	Run ID: **LACHAT2_160413B**			SeqNo: **3774958**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	5.243	0.020	5	0	105	90-110	0			

MS	Sample ID: **1604085-07B MS**			Units: **mg/L**			Analysis Date: **4/13/2016 11:59 AM**			
Client ID:	Run ID: **LACHAT2_160413B**			SeqNo: **3774962**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	5.381	0.020	5	0.4518	98.6	90-110	0			

MS	Sample ID: **1604370-09B MS**			Units: **mg/L**			Analysis Date: **4/13/2016 11:59 AM**			
Client ID:	Run ID: **LACHAT2_160413B**			SeqNo: **3774977**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	5.091	0.020	5	0.1291	99.2	90-110	0			

MSD	Sample ID: **1604085-07B MSD**			Units: **mg/L**			Analysis Date: **4/13/2016 11:59 AM**			
Client ID:	Run ID: **LACHAT2_160413B**			SeqNo: **3774963**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	5.357	0.020	5	0.4518	98.1	90-110	5.381	0.447	20	

MSD	Sample ID: **1604370-09B MSD**			Units: **mg/L**			Analysis Date: **4/13/2016 11:59 AM**			
Client ID:	Run ID: **LACHAT2_160413B**			SeqNo: **3774978**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	5.094	0.020	5	0.1291	99.3	90-110	5.091	0.0589	20	

The following samples were analyzed in this batch: 1604561-03C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **R185327** Instrument ID **LACHAT2** Method: **E353.2 R2.0**

MBLK Sample ID: **MBLK-R185327** Units: **mg/L** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413C** SeqNo: **3774998** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	U	0.020								

LCS Sample ID: **LCS-R185327** Units: **mg/L** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413C** SeqNo: **3774999** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	5.183	0.020	5	0	104	80-120	0			

MS Sample ID: **1604481-01C MS** Units: **mg/L** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413C** SeqNo: **3775010** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	5.142	0.020	5	0.07779	101	75-125	0			

MS Sample ID: **1604486-09E MS** Units: **mg/L** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413C** SeqNo: **3775028** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	4.948	0.020	5	0.02465	98.5	75-125	0			

MSD Sample ID: **1604481-01C MSD** Units: **mg/L** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413C** SeqNo: **3775011** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	5.155	0.020	5	0.07779	102	75-125	5.142	0.253	20	

MSD Sample ID: **1604486-09E MSD** Units: **mg/L** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413C** SeqNo: **3775029** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	4.941	0.020	5	0.02465	98.3	75-125	4.948	0.142	20	

The following samples were analyzed in this batch: 1604561-03C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **R185412** Instrument ID **LACHAT2** Method: **E365.1 R2.0**

MBLK Sample ID: **MBLK-R185412** Units: **mg/L** Analysis Date: **4/14/2016 11:38 AM**
Client ID: Run ID: **LACHAT2_160414A** SeqNo: **3776877** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	U	0.050								

LCS Sample ID: **LCS-R185412** Units: **mg/L** Analysis Date: **4/14/2016 11:38 AM**
Client ID: Run ID: **LACHAT2_160414A** SeqNo: **3776878** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	1.001	0.050	1	0	100	90-110	0			

MS Sample ID: **1604560-01G MS** Units: **mg/L** Analysis Date: **4/14/2016 11:38 AM**
Client ID: Run ID: **LACHAT2_160414A** SeqNo: **3776890** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	1.405	0.050	1	0.3229	108	90-110	0			

MS Sample ID: **1604628-10A MS** Units: **mg/L** Analysis Date: **4/14/2016 11:38 AM**
Client ID: Run ID: **LACHAT2_160414A** SeqNo: **3776905** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	1.101	0.050	1	0.08483	102	90-110	0			

MSD Sample ID: **1604560-01G MSD** Units: **mg/L** Analysis Date: **4/14/2016 11:38 AM**
Client ID: Run ID: **LACHAT2_160414A** SeqNo: **3776891** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	1.452	0.050	1	0.3229	113	90-110	1.405	3.29	20	S

MSD Sample ID: **1604628-10A MSD** Units: **mg/L** Analysis Date: **4/14/2016 11:38 AM**
Client ID: Run ID: **LACHAT2_160414A** SeqNo: **3776906** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	1.131	0.050	1	0.08483	105	90-110	1.101	2.69	20	

The following samples were analyzed in this batch: 1604561-03C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **R185421** Instrument ID **GALLERY** Method: **A4500-Cl E-97**

MBLK Sample ID: **WBLKW1-160414-R185421** Units: **mg/L** Analysis Date: **4/14/2016 12:15 PM**
Client ID: Run ID: **GALLERY_160414A** SeqNo: **3777031** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	1.0								

MS Sample ID: **1604476-02A MS** Units: **mg/L** Analysis Date: **4/14/2016 12:15 PM**
Client ID: Run ID: **GALLERY_160414A** SeqNo: **3777043** Prep Date: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	101	2.0	50	53.35	95.4	75-125	0			

MSD Sample ID: **1604476-02A MSD** Units: **mg/L** Analysis Date: **4/14/2016 12:15 PM**
Client ID: Run ID: **GALLERY_160414A** SeqNo: **3777044** Prep Date: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	101.3	2.0	50	53.35	96	75-125	101	0.277	25	

LCS1 Sample ID: **WLCS1W1-160414-R185421** Units: **mg/L** Analysis Date: **4/14/2016 12:15 PM**
Client ID: Run ID: **GALLERY_160414A** SeqNo: **3777032** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	10.44	1.0	10	0	104	80-120	0			

LCS2 Sample ID: **WLCS2W1-160414-R185421** Units: **mg/L** Analysis Date: **4/14/2016 12:15 PM**
Client ID: Run ID: **GALLERY_160414A** SeqNo: **3777040** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	49.93	1.0	50	0	99.9	80-120	0			

The following samples were analyzed in this batch: 1604561-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604561
Project: RCK001 - Lagoon D

QC BATCH REPORT

Batch ID: **R185441** Instrument ID **WETCHEM** Method: **E410.4 R2.0**

MBLK Sample ID: **CCB/MBLANK-R185441** Units: **mg/L** Analysis Date: **4/14/2016 04:10 PM**
Client ID: Run ID: **WETCHEM_160414Q** SeqNo: **3777274** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	U	5.0								

LCS Sample ID: **CCV/LCS-R185441** Units: **mg/L** Analysis Date: **4/14/2016 04:10 PM**
Client ID: Run ID: **WETCHEM_160414Q** SeqNo: **3777273** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	30.83	5.0	30	0	103	90-110	0			

MS Sample ID: **1604486-01E MS** Units: **mg/L** Analysis Date: **4/14/2016 04:10 PM**
Client ID: Run ID: **WETCHEM_160414Q** SeqNo: **3777277** Prep Date: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	75.22	10	30	37.61	125	90-110	0			S

MS Sample ID: **1604555-07C MS** Units: **mg/L** Analysis Date: **4/14/2016 04:10 PM**
Client ID: Run ID: **WETCHEM_160414Q** SeqNo: **3778270** Prep Date: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	43.56	10	30	15.32	94.1	90-110	0			

MSD Sample ID: **1604486-01E MSD** Units: **mg/L** Analysis Date: **4/14/2016 04:10 PM**
Client ID: Run ID: **WETCHEM_160414Q** SeqNo: **3777278** Prep Date: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	74.58	10	30	37.61	123	90-110	75.22	0.854	25	S

MSD Sample ID: **1604555-07C MSD** Units: **mg/L** Analysis Date: **4/14/2016 04:10 PM**
Client ID: Run ID: **WETCHEM_160414Q** SeqNo: **3778271** Prep Date: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	41.62	10	30	15.32	87.7	90-110	43.56	4.56	25	S

The following samples were analyzed in this batch: 1604561-03C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1604561

PAGE 1 OF 1

NO. 1049

HULL

CHAIN OF CUSTODY RECORD

Dublin, OH ☐	Indianapolis, IN ☐	Mason, OH ☐	Bedford, OH ☐	Toledo, OH ☑	St. Clairsville, OH ☐	Pittsburgh, PA ☐
6397 Emerald Pkwy	8445 Keystone Crossing	4770 Duke Dr.	4 Hemisphere Way	3401 Glendale Ave.	146 W. Main St.	Campbells Run Business Center
Suite 200	Suite 135	Suite 300	Bedford, OH 44146	Suite 300	2nd Floor	300 Business Center Dr., Suite 320
Dublin, OH 43016	Indianapolis, IN 46240	Mason, OH 45040	P: (440) 232-9945	Toledo, OH 43614	St. Clairsville, OH 43950	Pittsburgh, PA 15205
P: (614) 793-8777	P: (800) 241-7173	P: (513) 459-9677		P: (419) 385-2018	P: (800) 241-7173	P: (412) 446-0315

REPORT TO: Matt Bell

Client: Rocky Ridge Dev.

Site: City of Toledo WTP

Project #: Lagoon D Phase:

Samplers: Scott Stansley

Purchase Order #

SAMPLE MATRIX
AA-AMBIENT AIR
C-ASBESTOS
D-SEDIMENT
G-GROUNDWATER
IA-INDOOR AIR
L-LEACHATE
P-PRODUCT
S-SOIL
SG-SOIL GAS
SS-SUBSLAB VAPOR
W-WATER
X-CONCRETE

PRESERVATIVES
A-Cool only, <4 deg. C
B-HNO_3 pH<2
C-H_2SO_4 pH<2
D-NaOH pH>12
E-ZnAcetate + NaOH, pH>9
F-$Na_2S_2O_3$ (0.008%)
G-HCL pH <2
H-EDTA
I-5ml 1:1 HCL
J-none
K-Stored in dark
L-NH_4Cl
M-Methanol
S-Sodium

METALS
N - Not filtered
F45u- filtered with 0.45 micron
F5u- filtered with 5 micron

ANALYSES / PRESERVATIVES

PROJECT NO. : SAMPLE LOCATION : SAMPLE MATRIX & ID	NO. OF CONT.	SAMPLE TYPE (discrete, composite)	COLLECTION DATE/TIME	METALS	* See Attached Analyte List								COMMENTS
RCL001 : D-2 : S000130	5	Composit	4-9-16 / 1630	—	X								
RCL001 : D-3 : S000090	5	Composite	4-9-16 / 1630	—	X								
RCL001 : FB-1 : W041116	9	discrete	4-11-16 / 0900	N	X								
			/										
			/										
			/										
			/										
			/										
			/										
			/										

RELINQUISHED BY: Scott Stansley	DATE: 4-11-16	RECEIVED BY: MARD	DATE: 4-11-16	Deliver To:	ALS
	TIME: 11:20		TIME: 11:20	Method of Delivery:	Fed Ex
RELINQUISHED BY: MARD	DATE: 4-11-16	RECEIVED BY: Fed Ex	DATE: 4-11-16	Airbill Number:	
	TIME: 1700		TIME: 1700	Regulatory Program:	
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE: 4/12/16	Required Limits:	
	TIME:		TIME: 0930		

COOLER TEMPERATURE AS RECEIVED: 4.0 °C

DISTRIBUTION: WHITE -LAB USE (MUST BE RETURNED WITH REPORT); YELLOW -LAB USE; PINK -RETAINED BY HULL

NOTES: Ohio VAP
EPA Region 9 RSLs

TURN AROUND TIME: Standard DAYS

Table 1
Summary of Totals and Geotechnical Analyses for Spent Lime

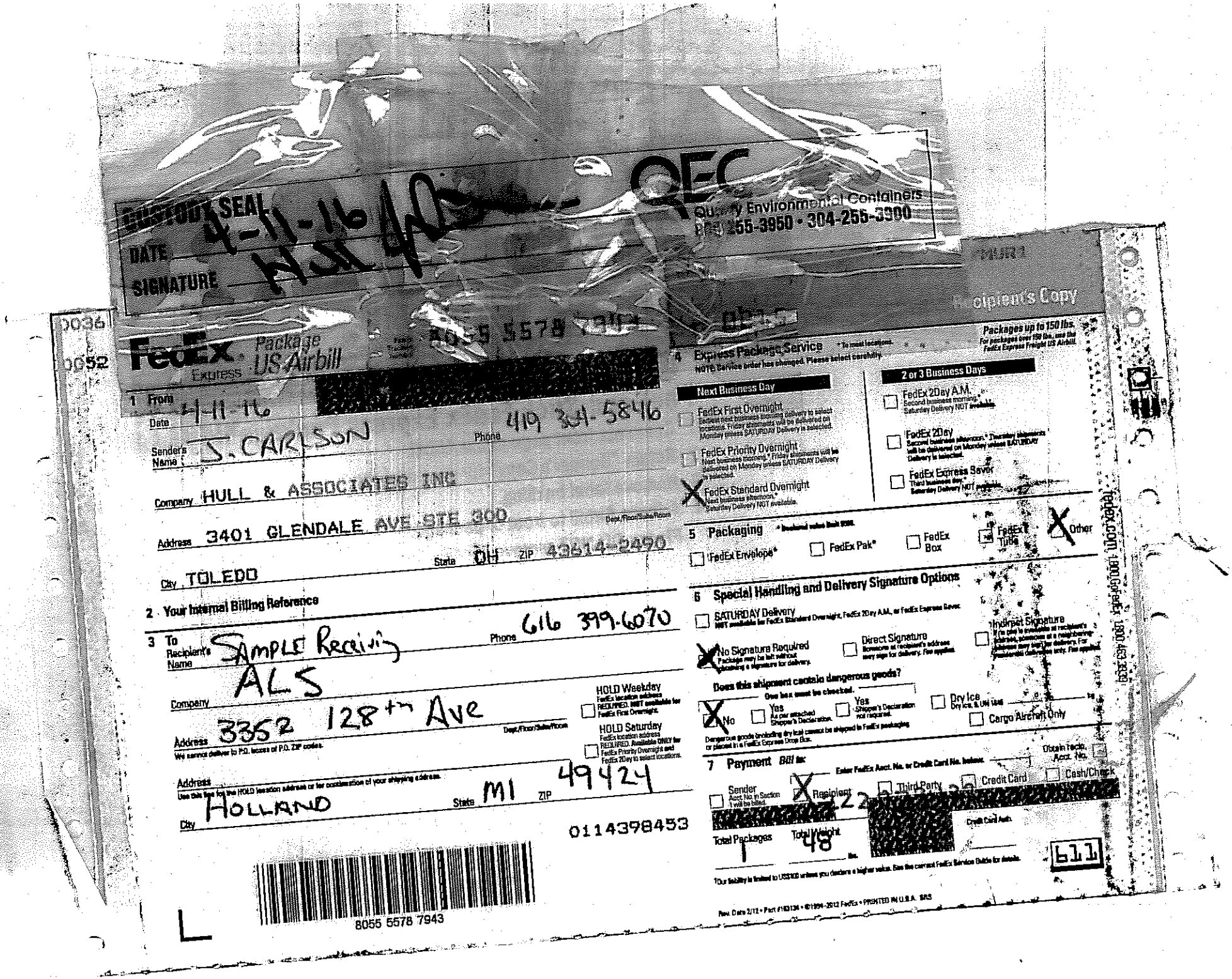
Chemical Sampling Parameter	Lab Chemical Sampling Method	# of Samples	Applicable Target Standards
pH	SW9045D	3 composite samples per lagoon (9 total samples); Chemical Only - 1 Duplicate Sample and 1 Field/Equipment Blank	1. Ohio Voluntary Action Program (VAP) - Residential Category 2. USEPA Region 9 Regional Screening Levels Residential Category 3. Ohio Background Metals (Cox and Colvin)
Organic Carbon - Walkley-Black	TITRAMETRIC		
Chemical Oxygen Demand	E410.4 R2.0		
Biochemical Oxygen Demand	A5210B-97		
Chloride	A4500-Cl E-97		
Metals by ICP-MS Na, Mg, K	SW6020A		
Nitrogen, Total Kjeldahl	A4500-NH3 G-97		
Nitrogen, Total	Calculation		
Nitrogen, Total Inorganic	Calculation		
Nitrogen, Total Organic	Calculation		
Nitrogen, Nitrite	A4500-NO2 B		
Nitrogen, Nitrate	E353.2		
Nitrogen, Nitrate-Nitrite	E353.2		
Ammonia as Nitrogen	A4500-NH3 G-97		
Phosphorus, Total	E365.1 R2.0		
Phosphorus, Ortho-P (As P)	A4500-P E-97		
Priority Pollutant VOCs	SW8260B		
Priority Pollutant SVOCs	SW8270C		
PCBs	SW8082		
Priority Pollutant Pesticides	SW8081A		
Cyanide, Total	SW9012B		
Metals by ICP-MS	SW6020A		
Priority Pollutant Metals, Mercury by CVAA	SW7471A		
Geotechnical Sampling Parameter	**Geotechnical Sampling Method**		**Applicable Target Standards**
USCS: Particle Size	~~ASTM D2487 / ASTM D422~~		~~Not Applicable~~
Moisture Content by Mass	~~ASTM D2216~~		
Liquid Limit	ASTM D4318		
Plastic Limit			

Notes

1. Rocky Ridge will collect, pack, and ship 3 composite samples from each lagoon to the analytical laboratory. Each composite sample will characterize the entire depth of lime material. See Figure 2 for proposed sampling locations.

2. Rocky Ridge will collect five (5) buckets of the lime from each lagoon (15 total buckets) for use in preparing lime/soil blends for further testing. Each lagoon should be appropriately labeled (e.g., Lagoon D-1, Lagoon D-2, etc.)

3. Rocky Ridge will be responsible for all data collection, field reports and general documentation of field activities during the lime characterization.


QEC
Quality Environmental Containers
304-255-3950 • 304-255-3900
EXHIBIT SEAL
DATE 4-11-16
SIGNATURE
FedEx Express Package US Airbill
8055 5578 7943
Recipient's Copy
1 From
Date 4-11-16
Sender's Name S. CARLSON
Phone 419 381-5846
Company HULL & ASSOCIATES INC
Address 3401 GLENDALE AVE STE 300
Dept./Floor/Suite/Room
City TOLEDO
State OH ZIP 43614-2490
2 Your Internal Billing Reference
3 To
Recipient's Name SAMPLE Receiving
Phone 616 399-6070
Company ALS
Address 3352 128th Ave
Dept./Floor/Suite/Room
We cannot deliver to P.O. boxes or P.O. ZIP codes.
Address
Use this line for the HOLD location address or for rescheduling of your shipping address.
City HOLLAND
State MI ZIP 49424
0114398453
4 Express Package Service
Packages up to 150 lbs.
For packages over 150 lbs., use the FedEx Express Freight US Airbill.
Next Business Day
FedEx First Overnight
FedEx Priority Overnight
X FedEx Standard Overnight
2 or 3 Business Days
FedEx 2Day A.M.
FedEx 2Day
FedEx Express Saver
5 Packaging
FedEx Envelope*
FedEx Pak*
FedEx Box
FedEx Tube
X Other
6 Special Handling and Delivery Signature Options
SATURDAY Delivery
X No Signature Required
Direct Signature
Indirect Signature
Does this shipment contain dangerous goods?
One box must be checked.
X No
Yes
Dry Ice
Cargo Aircraft Only
7 Payment Bill to:
Sender
X Recipient
Third Party
Credit Card
Cash/Check
Total Packages 1
Total Weight 48 lbs.
Credit Card Auth.
611
fedex.com 1.800.GoFedEx 1.800.463.3339

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **HULL&ASSOC-TOLEDO** Date/Time Received: **12-Apr-16 09:30**

Work Order: **1604561** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 12-Apr-16 (Date) Reviewed by: Bill Carey (eSignature) 13-Apr-16 (Date)

Matrices: Soil, Water

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☐	No ☑	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	4.0/4.0 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/12/2016 12:04:09 PM		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

21-Apr-2016

Matt Beil
Hull & Associates, Inc.
3401 Glendale Ave
Suite 300
Toledo, OH 43614

Re: **RCK001** Work Order: **1604500**

Dear Matt, Revision: **1**

ALS Environmental received 2 samples on 09-Apr-2016 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with Ohio VAP standard requirements and QC results achieved laboratory specifications in accordance with VAP approved SOPs and the ALS Quality Assurance Manual. Any exceptions are noted in the Case Narrative, with qualifiers in the report , with QC batch information, and/or are identified on the certified laboratory affidavit. Should this laboratory report need to be reproduced, it shall be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless additional storage arrangements are made.

The total number of pages in this report is 54.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Certificate No: OH: CL 103

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

ALS Group USA, Corp

Date: 21-Apr-16

Client: Hull & Associates, Inc.
Project: RCK001
Work Order: **1604500**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1604500-01	RCK001:D-1:D000130	Soil	D-1	4/7/2016 16:45	4/9/2016 09:30	☐
1604500-02	RCK001:D-1:D000130A	Soil	D-1	4/7/2016 16:45	4/9/2016 09:30	☐

Revision: 1

ALS Group USA, Corp

Date: 21-Apr-16

Client: Hull & Associates, Inc.
Project: RCK001
WorkOrder: **1604500**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and PQL, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight
s.u.	Standard Units

Client: Hull & Associates, Inc.
Project: RCK001
Work Order: 1604500

Case Narrative

Samples for the above noted Work Order were received on 4/9/2016. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

With the following exceptions, all sample analyses achieved analytical criteria.

Volatile Organics:
Batch 84608, Method VOC_8260_S, Sample LCS-84608: The LCS recovery was above the upper control limit. All the sample results in the batch were non-detect. No qualification is necessary for this analyte. Bromomethane

Extractable Organics:
Batch 84542, Method PEST_8081A_OVAP_S, Sample 1604500-01C: The reporting limit is elevated due to dilution needed to eliminate matrix-related interference for this analyte: All - Sample required dilution based on the yellow color of the sample extract.

Batch 84542, Method PEST_8081A_OVAP_S, Sample 1604500-02C: The reporting limit is elevated due to dilution needed to eliminate matrix-related interference for this analyte: All - Sample required dilution based on the yellow color of the sample extract.

Metals:
Batch 84676, Method ICP_6020_S, Sample 1604500-01C: The reporting limit is elevated due to dilution for high concentrations of non-target analytes.

Batch 84676, Method ICP_6020_S, Sample 1604500-02C: The reporting limit is elevated due to dilution for high concentrations of non-target analytes.

Wet Chemistry:
Batch 84581, Method BOD_5210B_S, Sample 1604500-01C: The sample dilutions set up for BOD analysis did not meet the oxygen depletion criteria of at least 2 mg/L. The result should be considered estimated.

Batch 84581, Method BOD_5210B_S, Sample 1604500-02C: The sample dilutions set up for BOD analysis did not meet the oxygen depletion criteria of at least 2 mg/L. The result should be considered estimated.

Batch 84585, Method PO4_4500E_S, Sample 1604500-01C MS: The MS recovery was below the lower control limit. The corresponding result in the parent sample may be biased low for this analyte.

Batch 84585, Method PO4_4500E_S, Sample 1604500-01C MSD: The MSD recovery was below the lower control limit. The corresponding result in the parent sample may be biased low for this analyte.

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:D-1:D000130
Collection Date: 4/7/2016 04:45 PM

Work Order: 1604500
Lab ID: 1604500-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 4/11/16		Analyst: **EB**
Aroclor 1016	U		31	270	µg/Kg-dry	1	4/13/2016 00:05
Aroclor 1221	U		31	270	µg/Kg-dry	1	4/13/2016 00:05
Aroclor 1232	U		31	270	µg/Kg-dry	1	4/13/2016 00:05
Aroclor 1242	U		31	270	µg/Kg-dry	1	4/13/2016 00:05
Aroclor 1248	U		31	270	µg/Kg-dry	1	4/13/2016 00:05
Aroclor 1254	U		40	270	µg/Kg-dry	1	4/13/2016 00:05
Aroclor 1260	U		40	270	µg/Kg-dry	1	4/13/2016 00:05
Surr: Decachlorobiphenyl	*75.1*			*40-140*	*%REC*	1	4/13/2016 00:05
Surr: Tetrachloro-m-xylene	*84.1*			*45-124*	*%REC*	1	4/13/2016 00:05
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 4/11/16		Analyst: **BLM**
4,4´-DDD	U		43	320	µg/Kg-dry	10	4/11/2016 19:16
4,4´-DDE	U		67	320	µg/Kg-dry	10	4/11/2016 19:16
4,4´-DDT	U		58	320	µg/Kg-dry	10	4/11/2016 19:16
Aldrin	U		50	320	µg/Kg-dry	10	4/11/2016 19:16
alpha-BHC	U		34	320	µg/Kg-dry	10	4/11/2016 19:16
alpha-Chlordane	U		54	320	µg/Kg-dry	10	4/11/2016 19:16
beta-BHC	U		110	320	µg/Kg-dry	10	4/11/2016 19:16
Chlordane, Technical	U		230	800	µg/Kg-dry	10	4/11/2016 19:16
delta-BHC	U		50	320	µg/Kg-dry	10	4/11/2016 19:16
Dieldrin	U		67	320	µg/Kg-dry	10	4/11/2016 19:16
Endosulfan I	U		42	320	µg/Kg-dry	10	4/11/2016 19:16
Endosulfan II	U		72	320	µg/Kg-dry	10	4/11/2016 19:16
Endosulfan sulfate	U		57	320	µg/Kg-dry	10	4/11/2016 19:16
Endrin	U		54	320	µg/Kg-dry	10	4/11/2016 19:16
Endrin aldehyde	U		130	320	µg/Kg-dry	10	4/11/2016 19:16
gamma-BHC (Lindane)	U		45	320	µg/Kg-dry	10	4/11/2016 19:16
Heptachlor	U		50	320	µg/Kg-dry	10	4/11/2016 19:16
Heptachlor epoxide	U		45	320	µg/Kg-dry	10	4/11/2016 19:16
Toxaphene	U		240	1,900	µg/Kg-dry	10	4/11/2016 19:16
Surr: Decachlorobiphenyl	*110*			*45-135*	*%REC*	10	4/11/2016 19:16
Surr: Tetrachloro-m-xylene	*100*			*45-124*	*%REC*	10	4/11/2016 19:16
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 4/15/16		Analyst: **LR**
Mercury	**0.0077**	J	**0.0028**	**0.033**	**mg/Kg-dry**	1	4/18/2016 10:12
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 4/13/16		Analyst: **ML**
Magnesium	**14,000**		**8.2**	**290**	**mg/Kg-dry**	10	4/13/2016 18:53
Potassium	**250**	J	**51**	**290**	**mg/Kg-dry**	10	4/13/2016 18:53
Sodium	**240**	J	**30**	**290**	**mg/Kg-dry**	10	4/14/2016 14:26

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:D-1:D000130
Collection Date: 4/7/2016 04:45 PM

Work Order: 1604500
Lab ID: 1604500-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 4/15/16		Analyst: **RH**
Antimony	U		0.093	7.7	mg/Kg-dry	10	4/15/2016 19:43
Arsenic	U		1.2	7.7	mg/Kg-dry	10	4/15/2016 19:43
Beryllium	**0.14**	J	**0.12**	**3.1**	**mg/Kg-dry**	10	4/15/2016 19:43
Cadmium	**0.21**	J	**0.12**	**3.1**	**mg/Kg-dry**	10	4/15/2016 19:43
Chromium	**1.7**	J	**1.2**	**7.7**	**mg/Kg-dry**	10	4/15/2016 19:43
Copper	**4.6**	J	**0.40**	**7.7**	**mg/Kg-dry**	10	4/15/2016 19:43
Lead	**1.7**	J	**0.19**	**7.7**	**mg/Kg-dry**	10	4/15/2016 19:43
Nickel	**7.3**	J	**1.3**	**7.7**	**mg/Kg-dry**	10	4/15/2016 19:43
Selenium	U		1.2	7.7	mg/Kg-dry	10	4/15/2016 19:43
Silver	U		0.22	7.7	mg/Kg-dry	10	4/15/2016 19:43
Thallium	**0.30**	J	**0.22**	**7.7**	**mg/Kg-dry**	10	4/15/2016 19:43
Zinc	**10**	J	**3.1**	**15**	**mg/Kg-dry**	10	4/15/2016 19:43
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 4/13/16		Analyst: **RM**
1,2-Diphenylhydrazine	U		12	140	µg/Kg-dry	1	4/14/2016 01:49
2,4,6-Trichlorophenol	U		27	140	µg/Kg-dry	1	4/14/2016 01:49
2,4-Dichlorophenol	U		29	140	µg/Kg-dry	1	4/14/2016 01:49
2,4-Dimethylphenol	U		33	140	µg/Kg-dry	1	4/14/2016 01:49
2,4-Dinitrophenol	U		42	140	µg/Kg-dry	1	4/14/2016 01:49
2,4-Dinitrotoluene	U		20	140	µg/Kg-dry	1	4/14/2016 01:49
2,6-Dinitrotoluene	U		29	140	µg/Kg-dry	1	4/14/2016 01:49
2-Chloronaphthalene	U		7.6	28	µg/Kg-dry	1	4/14/2016 01:49
2-Chlorophenol	U		25	140	µg/Kg-dry	1	4/14/2016 01:49
2-Nitrophenol	U		37	140	µg/Kg-dry	1	4/14/2016 01:49
3,3´-Dichlorobenzidine	U		180	700	µg/Kg-dry	1	4/14/2016 01:49
4,6-Dinitro-2-methylphenol	U		20	140	µg/Kg-dry	1	4/14/2016 01:49
4-Bromophenyl phenyl ether	U		20	140	µg/Kg-dry	1	4/14/2016 01:49
4-Chloro-3-methylphenol	U		20	140	µg/Kg-dry	1	4/14/2016 01:49
4-Chlorophenyl phenyl ether	U		25	140	µg/Kg-dry	1	4/14/2016 01:49
4-Nitrophenol	U		21	140	µg/Kg-dry	1	4/14/2016 01:49
Acenaphthene	U		11	28	µg/Kg-dry	1	4/14/2016 01:49
Acenaphthylene	U		8.6	28	µg/Kg-dry	1	4/14/2016 01:49
Anthracene	U		14	28	µg/Kg-dry	1	4/14/2016 01:49
Benzidine	U		140	700	µg/Kg-dry	1	4/14/2016 01:49
Benzo(a)anthracene	U		17	28	µg/Kg-dry	1	4/14/2016 01:49
Benzo(a)pyrene	U		5.9	28	µg/Kg-dry	1	4/14/2016 01:49
Benzo(b)fluoranthene	U		9.5	28	µg/Kg-dry	1	4/14/2016 01:49
Benzo(g,h,i)perylene	U		12	28	µg/Kg-dry	1	4/14/2016 01:49
Benzo(k)fluoranthene	U		18	28	µg/Kg-dry	1	4/14/2016 01:49

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:D-1:D000130
Collection Date: 4/7/2016 04:45 PM

Work Order: 1604500
Lab ID: 1604500-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		14	140	µg/Kg-dry	1	4/14/2016 01:49
Bis(2-chloroethyl)ether	U		16	140	µg/Kg-dry	1	4/14/2016 01:49
Bis(2-chloroisopropyl)ether	U		71	140	µg/Kg-dry	1	4/14/2016 01:49
Bis(2-ethylhexyl)phthalate	U		44	140	µg/Kg-dry	1	4/14/2016 01:49
Butyl benzyl phthalate	U		39	140	µg/Kg-dry	1	4/14/2016 01:49
Chrysene	U		24	28	µg/Kg-dry	1	4/14/2016 01:49
Dibenzo(a,h)anthracene	U		9.1	28	µg/Kg-dry	1	4/14/2016 01:49
Diethyl phthalate	U		18	140	µg/Kg-dry	1	4/14/2016 01:49
Dimethyl phthalate	U		14	140	µg/Kg-dry	1	4/14/2016 01:49
Di-n-butyl phthalate	U		38	140	µg/Kg-dry	1	4/14/2016 01:49
Di-n-octyl phthalate	U		37	140	µg/Kg-dry	1	4/14/2016 01:49
Fluoranthene	U		17	28	µg/Kg-dry	1	4/14/2016 01:49
Fluorene	U		16	28	µg/Kg-dry	1	4/14/2016 01:49
Hexachlorobenzene	U		23	140	µg/Kg-dry	1	4/14/2016 01:49
Hexachlorobutadiene	U		25	140	µg/Kg-dry	1	4/14/2016 01:49
Hexachlorocyclopentadiene	U		34	140	µg/Kg-dry	1	4/14/2016 01:49
Hexachloroethane	U		59	140	µg/Kg-dry	1	4/14/2016 01:49
Indeno(1,2,3-cd)pyrene	U		17	28	µg/Kg-dry	1	4/14/2016 01:49
Isophorone	U		25	700	µg/Kg-dry	1	4/14/2016 01:49
Naphthalene	U		7.3	28	µg/Kg-dry	1	4/14/2016 01:49
Nitrobenzene	U		31	700	µg/Kg-dry	1	4/14/2016 01:49
N-Nitrosodimethylamine	U		130	700	µg/Kg-dry	1	4/14/2016 01:49
N-Nitrosodi-n-propylamine	U		28	140	µg/Kg-dry	1	4/14/2016 01:49
N-Nitrosodiphenylamine	U		21	140	µg/Kg-dry	1	4/14/2016 01:49
Pentachlorophenol	U		48	140	µg/Kg-dry	1	4/14/2016 01:49
Phenanthrene	U		16	28	µg/Kg-dry	1	4/14/2016 01:49
Phenol	U		28	140	µg/Kg-dry	1	4/14/2016 01:49
Pyrene	U		21	28	µg/Kg-dry	1	4/14/2016 01:49
Surr: 2,4,6-Tribromophenol	*103*			*34-140*	*%REC*	1	4/14/2016 01:49
Surr: 2-Fluorobiphenyl	*82.1*			*12-100*	*%REC*	1	4/14/2016 01:49
Surr: 2-Fluorophenol	*84.6*			*33-117*	*%REC*	1	4/14/2016 01:49
Surr: 4-Terphenyl-d14	*88.9*			*25-137*	*%REC*	1	4/14/2016 01:49
Surr: Nitrobenzene-d5	*87.5*			*37-107*	*%REC*	1	4/14/2016 01:49
Surr: Phenol-d6	*81.4*			*40-106*	*%REC*	1	4/14/2016 01:49
VOLATILE ORGANICS - METHANOL CORRECTED		Method:	**SW8260B**		Prep: SW5035 / 4/12/16		Analyst: **BG**
1,1,1-Trichloroethane	U		29	100	µg/Kg-dry	1	4/13/2016 20:40
1,1,2,2-Tetrachloroethane	U		24	100	µg/Kg-dry	1	4/13/2016 20:40
1,1,2-Trichloroethane	U		30	100	µg/Kg-dry	1	4/13/2016 20:40
1,1-Dichloroethane	U		26	100	µg/Kg-dry	1	4/13/2016 20:40

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:D-1:D000130
Collection Date: 4/7/2016 04:45 PM

Work Order: 1604500
Lab ID: 1604500-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		27	100	µg/Kg-dry	1	4/13/2016 20:40
1,2-Dichlorobenzene	U		30	100	µg/Kg-dry	1	4/13/2016 20:40
1,2-Dichloroethane	U		27	100	µg/Kg-dry	1	4/13/2016 20:40
1,2-Dichloropropane	U		28	100	µg/Kg-dry	1	4/13/2016 20:40
1,3-Dichlorobenzene	U		32	100	µg/Kg-dry	1	4/13/2016 20:40
1,4-Dichlorobenzene	U		26	100	µg/Kg-dry	1	4/13/2016 20:40
Acrolein	U		300	670	µg/Kg-dry	1	4/13/2016 20:40
Acrylonitrile	U		85	330	µg/Kg-dry	1	4/13/2016 20:40
Benzene	U		23	100	µg/Kg-dry	1	4/13/2016 20:40
Bromodichloromethane	U		27	100	µg/Kg-dry	1	4/13/2016 20:40
Bromoform	U		36	100	µg/Kg-dry	1	4/13/2016 20:40
Bromomethane	U		44	250	µg/Kg-dry	1	4/13/2016 20:40
Carbon tetrachloride	U		18	100	µg/Kg-dry	1	4/13/2016 20:40
Chlorobenzene	U		30	100	µg/Kg-dry	1	4/13/2016 20:40
Chloroethane	U		64	330	µg/Kg-dry	1	4/13/2016 20:40
Chloroform	U		34	100	µg/Kg-dry	1	4/13/2016 20:40
Chloromethane	U		41	330	µg/Kg-dry	1	4/13/2016 20:40
cis-1,2-Dichloroethene	U		28	100	µg/Kg-dry	1	4/13/2016 20:40
cis-1,3-Dichloropropene	U		38	100	µg/Kg-dry	1	4/13/2016 20:40
Dibromochloromethane	U		23	100	µg/Kg-dry	1	4/13/2016 20:40
Ethylbenzene	U		23	100	µg/Kg-dry	1	4/13/2016 20:40
Methylene chloride	U		46	100	µg/Kg-dry	1	4/13/2016 20:40
Tetrachloroethene	U		49	100	µg/Kg-dry	1	4/13/2016 20:40
Toluene	U		33	100	µg/Kg-dry	1	4/13/2016 20:40
trans-1,2-Dichloroethene	U		28	100	µg/Kg-dry	1	4/13/2016 20:40
trans-1,3-Dichloropropene	U		18	100	µg/Kg-dry	1	4/13/2016 20:40
Trichloroethene	U		27	100	µg/Kg-dry	1	4/13/2016 20:40
Vinyl chloride	U		32	100	µg/Kg-dry	1	4/13/2016 20:40
Surr: 1,2-Dichloroethane-d4	*85.8*			*70-130*	*%REC*	1	4/13/2016 20:40
Surr: 4-Bromofluorobenzene	*94.5*			*70-130*	*%REC*	1	4/13/2016 20:40
Surr: Dibromofluoromethane	*83.8*			*70-130*	*%REC*	1	4/13/2016 20:40
Surr: Toluene-d8	*98.0*			*70-130*	*%REC*	1	4/13/2016 20:40
BIOCHEMICAL OXYGEN DEMAND		Method:	**A5210B-97**		Prep: EXTRACT / 4/9/16		Analyst: **JRF**
Biochemical Oxygen Demand	*<24.05*		18	18	mg/Kg-dry	1	4/14/2016 10:00
CHLORIDE		Method:	**A4500-CL E-97**		Prep: EXTRACT / 4/11/16		Analyst: **ED**
Chloride	**28**		**2.4**	**22**	**mg/Kg-dry**	1	4/15/2016 11:45
CYANIDE, TOTAL		Method:	**SW9012B**		Prep: SW9012B / 4/14/16		Analyst: **JB**
Cyanide, Total	**0.026**	J	**0.024**	**1.1**	**mg/Kg-dry**	1	4/14/2016 09:54

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:D-1:D000130
Collection Date: 4/7/2016 04:45 PM

Work Order: 1604500
Lab ID: 1604500-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND			Method: **E410.4 R2.0**		Prep: EXTRACT / 4/11/16		Analyst: **JJG**
Chemical Oxygen Demand	**290**	J	**190**	**1,000**	**mg/Kg-dry**	1	4/12/2016 10:50
MOISTURE			Method: **SW3550C**				Analyst: **ED**
Moisture	**54**		**0.025**	**0.050**	**% of sample**	1	4/10/2016 15:56
NITROGEN, TOTAL			Method: **CALCULATION**				Analyst: **JJG**
Nitrogen, Total	**170**		**0**	**2.2**	**mg/Kg-dry**	1	4/14/2016 08:21
AMMONIA AS NITROGEN			Method: **A4500-NH3 G-97**		Prep: A4500-NH3 B / 4/11/16		Analyst: **JJG**
Ammonia as Nitrogen	**46**	X	**5.5**	**18**	**mg NH3-N/Kg-dry**	1	4/11/2016 13:48
NITROGEN, NITRITE			Method: **A4500-NO2 B**		Prep: EXTRACT / 4/12/16		Analyst: **JB**
Nitrogen, Nitrite	**0.042**	J	**0.015**	**1.3**	**mg/Kg-dry**	1	4/12/2016 12:00
NITROGEN, NITRATE			Method: **E353.2**		Prep: EXTRACT / 4/12/16		Analyst: **JJG**
Nitrogen, Nitrate	U		0.090	1.8	mg/Kg-dry	1	4/13/2016 11:59
NITROGEN, NITRATE-NITRITE			Method: **E353.2**		Prep: EXTRACT / 4/12/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**0.36**	J	**0.14**	**1.8**	**mg/Kg-dry**	1	4/13/2016 11:59
NITROGEN, TOTAL INORGANIC			Method: **CALCULATION**				Analyst: **JJG**
Nitrogen, Total Inorganic	**46**		**0**	**0.044**	**mg/Kg-dry**	1	4/14/2016 08:21
NITROGEN, TOTAL ORGANIC			Method: **CALCULATION**				Analyst: **JJG**
Nitrogen, Total Organic	**170**		**2.2**	**2.2**	**mg/Kg-dry**	1	4/14/2016 08:21
PHOSPHORUS, TOTAL			Method: **E365.1 R2.0**		Prep: E365.1 R2.0 / 4/12/16		Analyst: **JJG**
Phosphorus, Total	**2,100**		**360**	**1,500**	**mg/Kg-dry**	100	4/12/2016 11:19
PH			Method: **SW9045D**		Prep: EXTRACT / 4/11/16		Analyst: **STP**
pH	**8.8**		**0**		**s.u.**	1	4/11/2016 14:20
PHOSPHORUS, ORTHO-P (AS P)			Method: **A4500-P E-97**		Prep: E365.1 R2.0 / 4/12/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**57**		**1.5**	**3.2**	**mg/Kg-dry**	1	4/12/2016 10:22
NITROGEN, TOTAL KJELDAHL			Method: **A4500-NH3 G-97**		Prep: A4500-N B / 4/12/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**210**		**5.7**	**12**	**mg/Kg-dry**	1	4/13/2016 09:41
ORGANIC CARBON - WALKLEY-BLACK			Method: **TITRAMETRIC**				Analyst: **KF**
Organic Carbon - W-B	**0.61**		**0.026**	**0.055**	**% by wt-dry**	1	4/13/2016 10:20

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:D-1:D000130A
Collection Date: 4/7/2016 04:45 PM

Work Order: 1604500
Lab ID: 1604500-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 4/11/16		Analyst: **EB**
Aroclor 1016	U		31	260	µg/Kg-dry	1	4/13/2016 00:21
Aroclor 1221	U		31	260	µg/Kg-dry	1	4/13/2016 00:21
Aroclor 1232	U		31	260	µg/Kg-dry	1	4/13/2016 00:21
Aroclor 1242	U		31	260	µg/Kg-dry	1	4/13/2016 00:21
Aroclor 1248	U		31	260	µg/Kg-dry	1	4/13/2016 00:21
Aroclor 1254	U		39	260	µg/Kg-dry	1	4/13/2016 00:21
Aroclor 1260	U		39	260	µg/Kg-dry	1	4/13/2016 00:21
Surr: Decachlorobiphenyl	*78.1*			*40-140*	*%REC*	1	4/13/2016 00:21
Surr: Tetrachloro-m-xylene	*80.1*			*45-124*	*%REC*	1	4/13/2016 00:21
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 4/11/16		Analyst: **BLM**
4,4´-DDD	U		27	210	µg/Kg-dry	10	4/11/2016 19:31
4,4´-DDE	U		43	210	µg/Kg-dry	10	4/11/2016 19:31
4,4´-DDT	U		37	210	µg/Kg-dry	10	4/11/2016 19:31
Aldrin	U		32	210	µg/Kg-dry	10	4/11/2016 19:31
alpha-BHC	U		22	210	µg/Kg-dry	10	4/11/2016 19:31
alpha-Chlordane	U		35	210	µg/Kg-dry	10	4/11/2016 19:31
beta-BHC	U		73	210	µg/Kg-dry	10	4/11/2016 19:31
Chlordane, Technical	U		150	510	µg/Kg-dry	10	4/11/2016 19:31
delta-BHC	U		32	210	µg/Kg-dry	10	4/11/2016 19:31
Dieldrin	U		43	210	µg/Kg-dry	10	4/11/2016 19:31
Endosulfan I	U		27	210	µg/Kg-dry	10	4/11/2016 19:31
Endosulfan II	U		46	210	µg/Kg-dry	10	4/11/2016 19:31
Endosulfan sulfate	U		37	210	µg/Kg-dry	10	4/11/2016 19:31
Endrin	U		35	210	µg/Kg-dry	10	4/11/2016 19:31
Endrin aldehyde	U		83	210	µg/Kg-dry	10	4/11/2016 19:31
gamma-BHC (Lindane)	U		29	210	µg/Kg-dry	10	4/11/2016 19:31
Heptachlor	U		32	210	µg/Kg-dry	10	4/11/2016 19:31
Heptachlor epoxide	U		29	210	µg/Kg-dry	10	4/11/2016 19:31
Toxaphene	U		150	1,200	µg/Kg-dry	10	4/11/2016 19:31
Surr: Decachlorobiphenyl	*110*			*45-135*	*%REC*	10	4/11/2016 19:31
Surr: Tetrachloro-m-xylene	*90.1*			*45-124*	*%REC*	10	4/11/2016 19:31
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 4/15/16		Analyst: **LR**
Mercury	**0.011**	J	**0.0026**	**0.031**	**mg/Kg-dry**	1	4/18/2016 10:25
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 4/13/16		Analyst: **ML**
Magnesium	**13,000**		**8.7**	**310**	**mg/Kg-dry**	10	4/13/2016 18:59
Potassium	**330**		**53**	**310**	**mg/Kg-dry**	10	4/13/2016 18:59
Sodium	**240**	J	**31**	**310**	**mg/Kg-dry**	10	4/14/2016 14:32

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:D-1:D000130A
Collection Date: 4/7/2016 04:45 PM

Work Order: 1604500
Lab ID: 1604500-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 4/15/16		Analyst: **RH**
Antimony	U		0.089	7.4	mg/Kg-dry	10	4/15/2016 19:49
Arsenic	U		1.2	7.4	mg/Kg-dry	10	4/15/2016 19:49
Beryllium	U		0.12	3.0	mg/Kg-dry	10	4/15/2016 19:49
Cadmium	**0.13**	J	**0.12**	**3.0**	**mg/Kg-dry**	10	4/15/2016 19:49
Chromium	**1.7**	J	**1.2**	**7.4**	**mg/Kg-dry**	10	4/15/2016 19:49
Copper	**4.4**	J	**0.39**	**7.4**	**mg/Kg-dry**	10	4/15/2016 19:49
Lead	**1.8**	J	**0.18**	**7.4**	**mg/Kg-dry**	10	4/15/2016 19:49
Nickel	**7.2**	J	**1.3**	**7.4**	**mg/Kg-dry**	10	4/15/2016 19:49
Selenium	U		1.2	7.4	mg/Kg-dry	10	4/15/2016 19:49
Silver	U		0.21	7.4	mg/Kg-dry	10	4/15/2016 19:49
Thallium	U		0.21	7.4	mg/Kg-dry	10	4/15/2016 19:49
Zinc	**11**	J	**3.0**	**15**	**mg/Kg-dry**	10	4/15/2016 19:49
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 4/13/16		Analyst: **RM**
1,2-Diphenylhydrazine	U		11	130	µg/Kg-dry	1	4/14/2016 02:09
2,4,6-Trichlorophenol	U		26	130	µg/Kg-dry	1	4/14/2016 02:09
2,4-Dichlorophenol	U		28	130	µg/Kg-dry	1	4/14/2016 02:09
2,4-Dimethylphenol	U		32	130	µg/Kg-dry	1	4/14/2016 02:09
2,4-Dinitrophenol	U		41	130	µg/Kg-dry	1	4/14/2016 02:09
2,4-Dinitrotoluene	U		20	130	µg/Kg-dry	1	4/14/2016 02:09
2,6-Dinitrotoluene	U		28	130	µg/Kg-dry	1	4/14/2016 02:09
2-Chloronaphthalene	U		7.4	27	µg/Kg-dry	1	4/14/2016 02:09
2-Chlorophenol	U		24	130	µg/Kg-dry	1	4/14/2016 02:09
2-Nitrophenol	U		36	130	µg/Kg-dry	1	4/14/2016 02:09
3,3´-Dichlorobenzidine	U		170	680	µg/Kg-dry	1	4/14/2016 02:09
4,6-Dinitro-2-methylphenol	U		20	130	µg/Kg-dry	1	4/14/2016 02:09
4-Bromophenyl phenyl ether	U		20	130	µg/Kg-dry	1	4/14/2016 02:09
4-Chloro-3-methylphenol	U		20	130	µg/Kg-dry	1	4/14/2016 02:09
4-Chlorophenyl phenyl ether	U		24	130	µg/Kg-dry	1	4/14/2016 02:09
4-Nitrophenol	U		21	130	µg/Kg-dry	1	4/14/2016 02:09
Acenaphthene	U		10	27	µg/Kg-dry	1	4/14/2016 02:09
Acenaphthylene	U		8.4	27	µg/Kg-dry	1	4/14/2016 02:09
Anthracene	U		13	27	µg/Kg-dry	1	4/14/2016 02:09
Benzidine	U		140	680	µg/Kg-dry	1	4/14/2016 02:09
Benzo(a)anthracene	U		16	27	µg/Kg-dry	1	4/14/2016 02:09
Benzo(a)pyrene	U		5.8	27	µg/Kg-dry	1	4/14/2016 02:09
Benzo(b)fluoranthene	U		9.3	27	µg/Kg-dry	1	4/14/2016 02:09
Benzo(g,h,i)perylene	U		12	27	µg/Kg-dry	1	4/14/2016 02:09
Benzo(k)fluoranthene	U		17	27	µg/Kg-dry	1	4/14/2016 02:09

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:D-1:D000130A
Collection Date: 4/7/2016 04:45 PM

Work Order: 1604500
Lab ID: 1604500-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		14	130	µg/Kg-dry	1	4/14/2016 02:09
Bis(2-chloroethyl)ether	U		15	130	µg/Kg-dry	1	4/14/2016 02:09
Bis(2-chloroisopropyl)ether	U		69	130	µg/Kg-dry	1	4/14/2016 02:09
Bis(2-ethylhexyl)phthalate	U		43	130	µg/Kg-dry	1	4/14/2016 02:09
Butyl benzyl phthalate	U		38	130	µg/Kg-dry	1	4/14/2016 02:09
Chrysene	U		23	27	µg/Kg-dry	1	4/14/2016 02:09
Dibenzo(a,h)anthracene	U		8.9	27	µg/Kg-dry	1	4/14/2016 02:09
Diethyl phthalate	U		17	130	µg/Kg-dry	1	4/14/2016 02:09
Dimethyl phthalate	U		14	130	µg/Kg-dry	1	4/14/2016 02:09
Di-n-butyl phthalate	U		37	130	µg/Kg-dry	1	4/14/2016 02:09
Di-n-octyl phthalate	U		36	130	µg/Kg-dry	1	4/14/2016 02:09
Fluoranthene	U		17	27	µg/Kg-dry	1	4/14/2016 02:09
Fluorene	U		15	27	µg/Kg-dry	1	4/14/2016 02:09
Hexachlorobenzene	U		22	130	µg/Kg-dry	1	4/14/2016 02:09
Hexachlorobutadiene	U		25	130	µg/Kg-dry	1	4/14/2016 02:09
Hexachlorocyclopentadiene	U		33	130	µg/Kg-dry	1	4/14/2016 02:09
Hexachloroethane	U		58	130	µg/Kg-dry	1	4/14/2016 02:09
Indeno(1,2,3-cd)pyrene	U		17	27	µg/Kg-dry	1	4/14/2016 02:09
Isophorone	U		24	680	µg/Kg-dry	1	4/14/2016 02:09
Naphthalene	U		7.1	27	µg/Kg-dry	1	4/14/2016 02:09
Nitrobenzene	U		30	680	µg/Kg-dry	1	4/14/2016 02:09
N-Nitrosodimethylamine	U		120	680	µg/Kg-dry	1	4/14/2016 02:09
N-Nitrosodi-n-propylamine	U		27	130	µg/Kg-dry	1	4/14/2016 02:09
N-Nitrosodiphenylamine	U		21	130	µg/Kg-dry	1	4/14/2016 02:09
Pentachlorophenol	U		46	130	µg/Kg-dry	1	4/14/2016 02:09
Phenanthrene	**19**	J	**15**	**27**	**µg/Kg-dry**	1	4/14/2016 02:09
Phenol	U		27	130	µg/Kg-dry	1	4/14/2016 02:09
Pyrene	U		21	27	µg/Kg-dry	1	4/14/2016 02:09
Surr: 2,4,6-Tribromophenol	*101*			*34-140*	*%REC*	1	4/14/2016 02:09
Surr: 2-Fluorobiphenyl	*80.8*			*12-100*	*%REC*	1	4/14/2016 02:09
Surr: 2-Fluorophenol	*88.9*			*33-117*	*%REC*	1	4/14/2016 02:09
Surr: 4-Terphenyl-d14	*94.4*			*25-137*	*%REC*	1	4/14/2016 02:09
Surr: Nitrobenzene-d5	*89.9*			*37-107*	*%REC*	1	4/14/2016 02:09
Surr: Phenol-d6	*84.8*			*40-106*	*%REC*	1	4/14/2016 02:09
VOLATILE ORGANICS - METHANOL CORRECTED		Method: **SW8260B**			Prep: SW5035 / 4/12/16		Analyst: **BG**
1,1,1-Trichloroethane	U		28	98	µg/Kg-dry	1	4/13/2016 21:05
1,1,2,2-Tetrachloroethane	U		24	98	µg/Kg-dry	1	4/13/2016 21:05
1,1,2-Trichloroethane	U		29	98	µg/Kg-dry	1	4/13/2016 21:05
1,1-Dichloroethane	U		25	98	µg/Kg-dry	1	4/13/2016 21:05

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:D-1:D000130A
Collection Date: 4/7/2016 04:45 PM

Work Order: 1604500
Lab ID: 1604500-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		26	98	µg/Kg-dry	1	4/13/2016 21:05
1,2-Dichlorobenzene	U		29	98	µg/Kg-dry	1	4/13/2016 21:05
1,2-Dichloroethane	U		27	98	µg/Kg-dry	1	4/13/2016 21:05
1,2-Dichloropropane	U		27	98	µg/Kg-dry	1	4/13/2016 21:05
1,3-Dichlorobenzene	U		31	98	µg/Kg-dry	1	4/13/2016 21:05
1,4-Dichlorobenzene	U		26	98	µg/Kg-dry	1	4/13/2016 21:05
Acrolein	U		300	650	µg/Kg-dry	1	4/13/2016 21:05
Acrylonitrile	U		82	330	µg/Kg-dry	1	4/13/2016 21:05
Benzene	U		22	98	µg/Kg-dry	1	4/13/2016 21:05
Bromodichloromethane	U		26	98	µg/Kg-dry	1	4/13/2016 21:05
Bromoform	U		35	98	µg/Kg-dry	1	4/13/2016 21:05
Bromomethane	U		42	240	µg/Kg-dry	1	4/13/2016 21:05
Carbon tetrachloride	U		17	98	µg/Kg-dry	1	4/13/2016 21:05
Chlorobenzene	U		29	98	µg/Kg-dry	1	4/13/2016 21:05
Chloroethane	U		62	330	µg/Kg-dry	1	4/13/2016 21:05
Chloroform	U		33	98	µg/Kg-dry	1	4/13/2016 21:05
Chloromethane	U		39	330	µg/Kg-dry	1	4/13/2016 21:05
cis-1,2-Dichloroethene	U		28	98	µg/Kg-dry	1	4/13/2016 21:05
cis-1,3-Dichloropropene	U		37	98	µg/Kg-dry	1	4/13/2016 21:05
Dibromochloromethane	U		22	98	µg/Kg-dry	1	4/13/2016 21:05
Ethylbenzene	U		23	98	µg/Kg-dry	1	4/13/2016 21:05
Methylene chloride	U		45	98	µg/Kg-dry	1	4/13/2016 21:05
Tetrachloroethene	U		48	98	µg/Kg-dry	1	4/13/2016 21:05
Toluene	U		32	98	µg/Kg-dry	1	4/13/2016 21:05
trans-1,2-Dichloroethene	U		28	98	µg/Kg-dry	1	4/13/2016 21:05
trans-1,3-Dichloropropene	U		17	98	µg/Kg-dry	1	4/13/2016 21:05
Trichloroethene	U		26	98	µg/Kg-dry	1	4/13/2016 21:05
Vinyl chloride	U		31	98	µg/Kg-dry	1	4/13/2016 21:05
Surr: 1,2-Dichloroethane-d4	*92.1*			*70-120*	*%REC*	1	4/13/2016 21:05
Surr: 4-Bromofluorobenzene	*94.0*			*75-120*	*%REC*	1	4/13/2016 21:05
Surr: Dibromofluoromethane	*89.2*			*85-115*	*%REC*	1	4/13/2016 21:05
Surr: Toluene-d8	*97.6*			*85-120*	*%REC*	1	4/13/2016 21:05
BIOCHEMICAL OXYGEN DEMAND		Method:	**A5210B-97**		Prep: EXTRACT / 4/9/16		Analyst: **JRF**
Biochemical Oxygen Demand	*<23.91*		17	17	mg/Kg-dry	1	4/14/2016 10:00
CHLORIDE		Method:	**A4500-CL E-97**		Prep: EXTRACT / 4/11/16		Analyst: **ED**
Chloride	**28**		**2.3**	**21**	**mg/Kg-dry**	1	4/15/2016 11:45
CYANIDE, TOTAL		Method:	**SW9012B**		Prep: SW9012B / 4/14/16		Analyst: **JB**
Cyanide, Total	**0.075**	J	**0.023**	**1.0**	**mg/Kg-dry**	1	4/14/2016 09:54

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group USA, Corp

Date: *21-Apr-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:D-1:D000130A
Collection Date: 4/7/2016 04:45 PM

Work Order: 1604500
Lab ID: 1604500-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND			Method: **E410.4 R2.0**		Prep: EXTRACT / 4/11/16		Analyst: **JJG**
Chemical Oxygen Demand	**430**	J	**190**	**1,000**	**mg/Kg-dry**	1	4/12/2016 10:50
MOISTURE			Method: **SW3550C**				Analyst: **ED**
Moisture	**53**		**0.025**	**0.050**	**% of sample**	1	4/10/2016 15:56
NITROGEN, TOTAL			Method: **CALCULATION**				Analyst: **JJG**
Nitrogen, Total	**130**		**0**	**2.1**	**mg/Kg-dry**	1	4/14/2016 08:21
AMMONIA AS NITROGEN			Method: **A4500-NH3 G-97**		Prep: A4500-NH3 B / 4/11/16		Analyst: **JJG**
Ammonia as Nitrogen	**180**	X	**13**	**44**	**mg NH3-N/Kg-dry**	2	4/11/2016 13:48
NITROGEN, NITRITE			Method: **A4500-NO2 B**		Prep: EXTRACT / 4/12/16		Analyst: **JB**
Nitrogen, Nitrite	**0.028**	J	**0.014**	**1.2**	**mg/Kg-dry**	1	4/12/2016 12:00
NITROGEN, NITRATE			Method: **E353.2**		Prep: EXTRACT / 4/12/16		Analyst: **JJG**
Nitrogen, Nitrate	**0.50**	J	**0.083**	**1.7**	**mg/Kg-dry**	1	4/13/2016 11:59
NITROGEN, NITRATE-NITRITE			Method: **E353.2**		Prep: EXTRACT / 4/12/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**0.51**	J	**0.13**	**1.7**	**mg/Kg-dry**	1	4/13/2016 11:59
NITROGEN, TOTAL INORGANIC			Method: **CALCULATION**				Analyst: **JJG**
Nitrogen, Total Inorganic	**190**		**0**	**0.043**	**mg/Kg-dry**	1	4/14/2016 08:21
NITROGEN, TOTAL ORGANIC			Method: **CALCULATION**				Analyst: **JJG**
Nitrogen, Total Organic	U		2.1	2.1	mg/Kg-dry	1	4/14/2016 08:21
PHOSPHORUS, TOTAL			Method: **E365.1 R2.0**		Prep: E365.1 R2.0 / 4/12/16		Analyst: **JJG**
Phosphorus, Total	**2,000**		**370**	**1,500**	**mg/Kg-dry**	100	4/12/2016 11:19
PH			Method: **SW9045D**		Prep: EXTRACT / 4/11/16		Analyst: **STP**
pH	**8.8**		**0**		**s.u.**	1	4/11/2016 14:20
PHOSPHORUS, ORTHO-P (AS P)			Method: **A4500-P E-97**		Prep: E365.1 R2.0 / 4/12/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**56**		**1.5**	**3.2**	**mg/Kg-dry**	1	4/12/2016 10:22
NITROGEN, TOTAL KJELDAHL			Method: **A4500-NH3 G-97**		Prep: A4500-N B / 4/12/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**130**		**8.4**	**18**	**mg/Kg-dry**	1	4/13/2016 09:41
ORGANIC CARBON - WALKLEY-BLACK			Method: **TITRAMETRIC**				Analyst: **KF**
Organic Carbon - W-B	**0.56**		**0.026**	**0.053**	**% by wt-dry**	1	4/13/2016 10:20

Note: See Qualifiers page for a list of qualifiers and their definitions.

Revision: 1

ALS Group USA, Corp

Date: 21-Apr-16

Client: Hull & Associates, Inc.

Work Order: 1604500

Project: RCK001

QC BATCH REPORT

Batch ID: **84541** Instrument ID **GC14** Method: **SW8082**

MBLK Sample ID: **PBLKS1-84541-84541** Units: **µg/Kg** Analysis Date: **4/12/2016 10:41 AM**

Client ID: Run ID: **GC14_160412A** SeqNo: **3773914** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	U	83								
Aroclor 1221	U	83								
Aroclor 1232	U	83								
Aroclor 1242	U	83								
Aroclor 1248	U	83								
Aroclor 1254	U	83								
Aroclor 1260	U	83								
Surr: Decachlorobiphenyl	*30.67*	0	*33.3*	0	*92.1*	*40-140*	0			
Surr: Tetrachloro-m-xylene	*30.33*	0	*33.3*	0	*91.1*	*45-124*	0			

LCS Sample ID: **PLCSS1-84541-84541** Units: **µg/Kg** Analysis Date: **4/12/2016 10:58 AM**

Client ID: Run ID: **GC14_160412A** SeqNo: **3773915** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	906.3	83	833	0	109	50-130	0			
Aroclor 1260	979.3	83	833	0	118	50-130	0			
Surr: Decachlorobiphenyl	*30.67*	0	*33.3*	0	*92.1*	*40-140*	0			
Surr: Tetrachloro-m-xylene	*27.67*	0	*33.3*	0	*83.1*	*45-124*	0			

MS Sample ID: **1604319-26B MS** Units: **µg/Kg** Analysis Date: **4/12/2016 08:17 PM**

Client ID: Run ID: **GC14_160412A** SeqNo: **3773917** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	872.6	83	826.3	0	106	40-140	0			
Aroclor 1260	991.3	83	826.3	0	120	40-140	0			
Surr: Decachlorobiphenyl	*30.75*	0	*33.03*	0	*93.1*	*40-140*	0			
Surr: Tetrachloro-m-xylene	*26.78*	0	*33.03*	0	*81.1*	*45-124*	0			

MSD Sample ID: **1604319-26B MSD** Units: **µg/Kg** Analysis Date: **4/12/2016 08:33 PM**

Client ID: Run ID: **GC14_160412A** SeqNo: **3773918** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	846.1	81	811.6	0	104	40-140	872.6	3.09	50	
Aroclor 1260	942.5	81	811.6	0	116	40-140	991.3	5.05	50	
Surr: Decachlorobiphenyl	*30.85*	0	*32.45*	0	*95.1*	*40-140*	30.75	*0.332*		
Surr: Tetrachloro-m-xylene	*26.96*	0	*32.45*	0	*83.1*	*45-124*	26.78	*0.643*		

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

QC BATCH REPORT

Batch ID: **84542** Instrument ID **GC12** Method: **SW8081A**

MBLK Sample ID: **PBLKS1-84542-84542** Units: **µg/Kg** Analysis Date: **4/11/2016 05:57 PM**
Client ID: Run ID: **GC12_160411A** SeqNo: **3771150** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	U	10								
4,4´-DDE	U	10								
4,4´-DDT	U	10								
Aldrin	U	10								
alpha-BHC	U	10								
alpha-Chlordane	U	10								
beta-BHC	U	10								
Chlordane, Technical	U	25								
delta-BHC	U	10								
Dieldrin	U	10								
Endosulfan I	U	10								
Endosulfan II	U	10								
Endosulfan sulfate	U	10								
Endrin	U	10								
Endrin aldehyde	U	10								
gamma-BHC (Lindane)	U	10								
Heptachlor	U	10								
Heptachlor epoxide	U	10								
Toxaphene	U	60								
Surr: Decachlorobiphenyl	*32.67*	0	*33.3*	0	*98.1*	*45-135*	0			
Surr: Tetrachloro-m-xylene	*32.33*	0	*33.3*	0	*97.1*	*45-124*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84542** Instrument ID **GC12** Method: **SW8081A**

LCS Sample ID: **PLCSS1-84542-84542** Units: **µg/Kg** Analysis Date: **4/11/2016 06:13 PM**
Client ID: Run ID: **GC12_160411A** SeqNo: **3771151** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	34.33	10	33.33	0	103	30-135	0			
4,4´-DDE	32.67	10	33.33	0	98	70-125	0			
4,4´-DDT	30	10	33.33	0	90	45-140	0			
Aldrin	30	10	33.33	0	90	45-140	0			
alpha-BHC	29.33	10	33.33	0	88	60-125	0			
alpha-Chlordane	30.67	10	33.33	0	92	50-150	0			
beta-BHC	32	10	33.33	0	96	60-125	0			
delta-BHC	29.67	10	33.33	0	89	55-130	0			
Dieldrin	32.67	10	33.33	0	98	65-125	0			
Endosulfan I	33.67	10	33.33	0	101	15-135	0			
Endosulfan II	34.33	10	33.33	0	103	35-140	0			
Endosulfan sulfate	30.33	10	33.33	0	91	60-135	0			
Endrin	40.67	10	33.33	0	122	60-135	0			
Endrin aldehyde	29.67	10	33.33	0	89	35-145	0			
gamma-BHC (Lindane)	31	10	33.33	0	93	60-125	0			
Heptachlor	32.67	10	33.33	0	98	50-140	0			
Heptachlor epoxide	32.67	10	33.33	0	98	65-130	0			
Surr: Decachlorobiphenyl	*33*	0	*33.3*	0	*99.1*	*45-135*	0			
Surr: Tetrachloro-m-xylene	*31.67*	0	*33.3*	0	*95.1*	*45-124*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

QC BATCH REPORT

Batch ID: **84542** Instrument ID **GC12** Method: **SW8081A**

MS Sample ID: **1604501-01C MS** Units: **µg/Kg** Analysis Date: **4/11/2016 06:44 PM**
Client ID: Run ID: **GC12_160411A** SeqNo: **3771153** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	67.38	9.8	65.1	0	103	30-135	0			
4,4´-DDE	56.31	9.8	65.1	0	86.5	70-125	0			
4,4´-DDT	67.38	9.8	65.1	0	103	45-140	0			
Aldrin	56.96	9.8	65.1	0	87.5	45-140	0			
alpha-BHC	54.03	9.8	65.1	0	83	60-125	0			
alpha-Chlordane	58.92	9.8	65.1	0	90.5	50-150	0			
beta-BHC	60.54	9.8	65.1	0	93	60-125	0			
delta-BHC	58.92	9.8	65.1	0	90.5	55-130	0			
Dieldrin	62.82	9.8	65.1	0	96.5	65-125	0			
Endosulfan I	63.8	9.8	65.1	0	98	15-135	0			
Endosulfan II	67.38	9.8	65.1	0	103	35-140	0			
Endosulfan sulfate	65.75	9.8	65.1	0	101	60-135	0			
Endrin	87.56	9.8	65.1	0	134	60-135	0			
Endrin aldehyde	57.29	9.8	65.1	0	88	35-145	0			
gamma-BHC (Lindane)	57.61	9.8	65.1	0	88.5	60-125	0			
Heptachlor	64.45	9.8	65.1	0	99	50-140	0			
Heptachlor epoxide	61.52	9.8	65.1	0	94.5	65-130	0			
Surr: Decachlorobiphenyl	*32.22*	0	*32.52*	0	*99.1*	*45-135*	0			
Surr: Tetrachloro-m-xylene	*28.97*	0	*32.52*	0	*89.1*	*45-124*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84542** Instrument ID **GC12** Method: **SW8081A**

MSD Sample ID: **1604501-01C MSD** Units: **µg/Kg** Analysis Date: **4/11/2016 07:00 PM**
Client ID: Run ID: **GC12_160411A** SeqNo: **3771154** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	33.05	9.6	32.09	0	103	30-135	67.38	68.4	35	R
4,4´-DDE	25.99	9.6	32.09	0	81	70-125	56.31	73.7	35	R
4,4´-DDT	33.37	9.6	32.09	0	104	45-140	67.38	67.5	35	R
Aldrin	27.92	9.6	32.09	0	87	45-140	56.96	68.4	35	R
alpha-BHC	27.92	9.6	32.09	0	87	60-125	54.03	63.7	35	R
alpha-Chlordane	29.2	9.6	32.09	0	91	50-150	58.92	67.4	35	R
beta-BHC	29.52	9.6	32.09	0	92	60-125	60.54	68.9	35	R
delta-BHC	29.84	9.6	32.09	0	93	55-130	58.92	65.5	35	R
Dieldrin	30.16	9.6	32.09	0	94	65-125	62.82	70.2	35	R
Endosulfan I	30.48	9.6	32.09	0	95	15-135	63.8	70.7	35	R
Endosulfan II	33.37	9.6	32.09	0	104	35-140	67.38	67.5	35	R
Endosulfan sulfate	31.77	9.6	32.09	0	99	60-135	65.75	69.7	35	R
Endrin	42.68	9.6	32.09	0	133	60-135	87.56	68.9	35	R
Endrin aldehyde	28.56	9.6	32.09	0	89	35-145	57.29	66.9	35	R
gamma-BHC (Lindane)	28.88	9.6	32.09	0	90	60-125	57.61	66.4	35	R
Heptachlor	32.09	9.6	32.09	0	100	50-140	64.45	67	35	R
Heptachlor epoxide	30.48	9.6	32.09	0	95	65-130	61.52	67.5	35	R
Surr: Decachlorobiphenyl	*28.56*	0	*32.06*	0	*89.1*	*45-135*	32.22	*12.1*	*35*	
Surr: Tetrachloro-m-xylene	*28.24*	0	*32.06*	0	*88.1*	*45-124*	28.97	*2.56*	*35*	

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84787** Instrument ID **HG1** Method: **SW7471A**

MBLK Sample ID: **MBLK-84787-84787** Units: **mg/Kg** Analysis Date: **4/18/2016 10:07 AM**
Client ID: Run ID: **HG1_160418A** SeqNo: **3779737** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.020								

LCS Sample ID: **LCS-84787-84787** Units: **mg/Kg** Analysis Date: **4/18/2016 10:09 AM**
Client ID: Run ID: **HG1_160418A** SeqNo: **3779738** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1867	0.020	0.1665	0	112	80-120	0			

MS Sample ID: **1604500-01CMS** Units: **mg/Kg** Analysis Date: **4/18/2016 10:14 AM**
Client ID: **RCK001:D-1:D000130** Run ID: **HG1_160418A** SeqNo: **3779740** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1381	0.015	0.1232	0.00354	109	75-125	0			

MSD Sample ID: **1604500-01CMSD** Units: **mg/Kg** Analysis Date: **4/18/2016 10:16 AM**
Client ID: **RCK001:D-1:D000130** Run ID: **HG1_160418A** SeqNo: **3779741** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1365	0.015	0.1223	0.00354	109	75-125	0.1381	1.18	35	

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84676** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-84676-84676** Units: **mg/Kg** Analysis Date: **4/13/2016 03:54 PM**
Client ID: Run ID: **ICPMS1_160413A** SeqNo: **3775568** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	U	10								
Potassium	U	10								

MBLK Sample ID: **MBLK-84676-84676** Units: **mg/Kg** Analysis Date: **4/14/2016 01:12 PM**
Client ID: Run ID: **ICPMS1_160414A** SeqNo: **3776824** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	U	10								

LCS Sample ID: **LCS-84676-84676** Units: **mg/Kg** Analysis Date: **4/13/2016 04:00 PM**
Client ID: Run ID: **ICPMS1_160413A** SeqNo: **3775569** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	505	10	500	0	101	80-120	0			
Potassium	496.2	10	500	0	99.2	80-120	0			
Sodium	496.1	10	500	0	99.2	80-120	0			

MS Sample ID: **1604465-03BMS** Units: **mg/Kg** Analysis Date: **4/13/2016 05:26 PM**
Client ID: Run ID: **ICPMS1_160413A** SeqNo: **3775583** Prep Date: **4/13/2016** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	1125	51	635.3	377.2	118	75-125	0			
Potassium	883.4	51	635.3	125	119	75-125	0			
Sodium	714.9	51	635.3	15.69	110	75-125	0			

MSD Sample ID: **1604465-03BMSD** Units: **mg/Kg** Analysis Date: **4/13/2016 05:39 PM**
Client ID: Run ID: **ICPMS1_160413A** SeqNo: **3775584** Prep Date: **4/13/2016** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	1049	51	635.3	377.2	106	75-125	1125	6.99	25	
Potassium	878.8	51	635.3	125	119	75-125	883.4	0.519	25	
Sodium	702.7	51	635.3	15.69	108	75-125	714.9	1.72	25	

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84767** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-84767-84767** Units: **mg/Kg** Analysis Date: **4/15/2016 07:30 PM**
Client ID: Run ID: **ICPMS1_160415A** SeqNo: **3779283** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.50								
Arsenic	U	0.50								
Beryllium	U	0.50								
Cadmium	U	0.50								
Chromium	U	0.50								
Copper	U	0.50								
Lead	U	0.50								
Nickel	U	0.50								
Selenium	0.04284	0.50								J
Silver	U	0.50								
Thallium	U	0.50								
Zinc	U	0.50								

LCS Sample ID: **LCS-84767-84767** Units: **mg/Kg** Analysis Date: **4/15/2016 07:37 PM**
Client ID: Run ID: **ICPMS1_160415A** SeqNo: **3779284** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	4.75	0.50	5	0	95	80-120	0			
Arsenic	4.578	0.50	5	0	91.6	80-120	0			
Beryllium	4.81	0.50	5	0	96.2	80-120	0			
Cadmium	4.748	0.50	5	0	95	80-120	0			
Chromium	4.928	0.50	5	0	98.6	80-120	0			
Copper	4.791	0.50	5	0	95.8	80-120	0			
Lead	4.95	0.50	5	0	99	80-120	0			
Nickel	4.848	0.50	5	0	97	80-120	0			
Selenium	4.523	0.50	5	0	90.5	80-120	0			
Silver	4.938	0.50	5	0	98.8	80-120	0			
Thallium	4.752	0.50	5	0	95	80-120	0			
Zinc	4.672	0.50	5	0	93.4	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84767** Instrument ID **ICPMS1** Method: **SW6020A**

MS Sample ID: **1604500-02CMS** Units: **mg/Kg** Analysis Date: **4/15/2016 08:14 PM**
Client ID: **RCK001:D-1:D000130A** Run ID: **ICPMS1_160415A** SeqNo: **3779290** Prep Date: **4/15/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.393	7.0	6.964	-0.0751	92.9	75-125	0			J
Arsenic	7.159	7.0	6.964	0.3987	97.1	75-125	0			
Beryllium	7.256	7.0	6.964	0.04205	104	75-125	0			
Cadmium	6.955	7.0	6.964	0.06317	99	75-125	0			J
Chromium	7.994	7.0	6.964	0.7999	103	75-125	0			
Copper	8.364	7.0	6.964	2.061	90.5	75-125	0			
Lead	7.953	7.0	6.964	0.8222	102	75-125	0			
Nickel	9.875	7.0	6.964	3.363	93.5	75-125	0			
Selenium	7.019	7.0	6.964	0.4705	94	75-125	0			
Silver	6.667	7.0	6.964	0.02299	95.4	75-125	0			J
Thallium	6.841	7.0	6.964	0.03469	97.7	75-125	0			J
Zinc	12.05	7.0	6.964	5.37	95.9	75-125	0			

MSD Sample ID: **1604500-02CMSD** Units: **mg/Kg** Analysis Date: **4/15/2016 08:20 PM**
Client ID: **RCK001:D-1:D000130A** Run ID: **ICPMS1_160415A** SeqNo: **3779291** Prep Date: **4/15/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	7.507	7.0	7.022	-0.0751	108	75-125	6.393	16	25	
Arsenic	8.708	7.0	7.022	0.3987	118	75-125	7.159	19.5	25	
Beryllium	8.188	7.0	7.022	0.04205	116	75-125	7.256	12.1	25	
Cadmium	7.949	7.0	7.022	0.06317	112	75-125	6.955	13.3	25	
Chromium	8.883	7.0	7.022	0.7999	115	75-125	7.994	10.5	25	
Copper	9.544	7.0	7.022	2.061	107	75-125	8.364	13.2	25	
Lead	8.94	7.0	7.022	0.8222	116	75-125	7.953	11.7	25	
Nickel	11.12	7.0	7.022	3.363	111	75-125	9.875	11.9	25	
Selenium	8.153	7.0	7.022	0.4705	109	75-125	7.019	14.9	25	
Silver	7.577	7.0	7.022	0.02299	108	75-125	6.667	12.8	25	
Thallium	7.858	7.0	7.022	0.03469	111	75-125	6.841	13.8	25	
Zinc	13.34	7.0	7.022	5.37	113	75-125	12.05	10.2	25	

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84957** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-84957-84957** Units: **mg/Kg** Analysis Date: **4/15/2016 07:30 PM**
Client ID: Run ID: **ICPMS1_160415A** SeqNo: **3784864** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	0.9305	10								J
Potassium	U	10								

MBLK Sample ID: **MBLK-84957-84957** Units: **mg/Kg** Analysis Date: **4/20/2016 02:05 PM**
Client ID: Run ID: **ICPMS1_160420A** SeqNo: **3785049** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	U	10	0	0	0	0-0	0			

LCS Sample ID: **LCS-84957-84957** Units: **mg/Kg** Analysis Date: **4/15/2016 07:37 PM**
Client ID: Run ID: **ICPMS1_160415A** SeqNo: **3784865** Prep Date: **4/15/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	507.5	10	500	0	102	80-120	0			
Potassium	504	10	500	0	101	80-120	0			
Sodium	504.5	10	500	0	101	80-120	0			

MS Sample ID: **1604500-02CMS** Units: **mg/Kg** Analysis Date: **4/15/2016 08:14 PM**
Client ID: **RCK001:D-1:D000130A** Run ID: **ICPMS1_160415A** SeqNo: **3784867** Prep Date: **4/20/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	7068	140	696.4	6515	79.4	75-125	0			O
Potassium	851.7	140	696.4	107.5	107	75-125	0			
Sodium	862.1	140	696.4	154.5	102	75-125	0			

MSD Sample ID: **1604500-02CMSD** Units: **mg/Kg** Analysis Date: **4/15/2016 08:20 PM**
Client ID: **RCK001:D-1:D000130A** Run ID: **ICPMS1_160415A** SeqNo: **3784868** Prep Date: **4/20/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	8167	140	702.2	6515	235	75-125	7068	14.4	25	SO
Potassium	938.9	140	702.2	107.5	118	75-125	851.7	9.74	25	
Sodium	981	140	702.2	154.5	118	75-125	862.1	12.9	25	

The following samples were analyzed in this batch: 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

QC BATCH REPORT

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

MBLK Sample ID: **SBLKS1-84645-84645** Units: **µg/Kg** Analysis Date: **4/13/2016 05:07 PM**
Client ID: Run ID: **SVMS8_160413A** SeqNo: **3776151** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	33								
2,4,6-Trichlorophenol	U	33								
2,4-Dichlorophenol	U	33								
2,4-Dimethylphenol	U	33								
2,4-Dinitrophenol	U	33								
2,4-Dinitrotoluene	U	33								
2,6-Dinitrotoluene	U	33								
2-Chloronaphthalene	U	6.7								
2-Chlorophenol	U	33								
2-Nitrophenol	U	33								
3,3´-Dichlorobenzidine	U	170								
4,6-Dinitro-2-methylphenol	U	33								
4-Bromophenyl phenyl ether	U	33								
4-Chloro-3-methylphenol	U	33								
4-Chlorophenyl phenyl ether	U	33								
4-Nitrophenol	U	33								
Acenaphthene	U	6.7								
Acenaphthylene	U	6.7								
Anthracene	U	6.7								
Benzidine	U	170								
Benzo(a)anthracene	U	6.7								
Benzo(a)pyrene	U	6.7								
Benzo(b)fluoranthene	U	6.7								
Benzo(g,h,i)perylene	U	6.7								
Benzo(k)fluoranthene	U	6.7								
Bis(2-chloroethoxy)methane	U	33								
Bis(2-chloroethyl)ether	U	33								
Bis(2-chloroisopropyl)ether	U	33								
Bis(2-ethylhexyl)phthalate	U	33								
Butyl benzyl phthalate	U	33								
Chrysene	U	6.7								
Dibenzo(a,h)anthracene	U	6.7								
Diethyl phthalate	U	33								
Dimethyl phthalate	U	33								
Di-n-butyl phthalate	U	33								
Di-n-octyl phthalate	U	33								
Fluoranthene	U	6.7								
Fluorene	U	6.7								
Hexachlorobenzene	U	33								
Hexachlorobutadiene	U	33								
Hexachlorocyclopentadiene	U	33								
Hexachloroethane	U	33								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

Indeno(1,2,3-cd)pyrene	U	6.7					
Isophorone	U	170					
Naphthalene	U	6.7					
Nitrobenzene	U	170					
N-Nitrosodimethylamine	U	170					
N-Nitrosodi-n-propylamine	U	33					
N-Nitrosodiphenylamine	U	33					
Pentachlorophenol	U	33					
Phenanthrene	U	6.7					
Phenol	U	33					
Pyrene	U	6.7					
Surr: 2,4,6-Tribromophenol	*1434*	0	*1667*	0	*86*	*34-140*	0
Surr: 2-Fluorobiphenyl	*1401*	0	*1667*	0	*84.1*	*12-100*	0
Surr: 2-Fluorophenol	*1761*	0	*1667*	0	*106*	*33-117*	0
Surr: 4-Terphenyl-d14	*1622*	0	*1667*	0	*97.3*	*25-137*	0
Surr: Nitrobenzene-d5	*1569*	0	*1667*	0	*94.1*	*37-107*	0
Surr: Phenol-d6	*1759*	0	*1667*	0	*106*	*40-106*	0

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

LCS Sample ID: **SLCSS1-84645-84645** Units: **µg/Kg** Analysis Date: **4/13/2016 05:28 PM**

Client ID: Run ID: **SVMS8_160413A** SeqNo: **3776152** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	632.7	33	666.7	0	94.9	55-115	0			
2,4,6-Trichlorophenol	525.7	33	666.7	0	78.8	45-110	0			
2,4-Dichlorophenol	597	33	666.7	0	89.5	45-110	0			
2,4-Dimethylphenol	594.7	33	666.7	0	89.2	30-105	0			
2,4-Dinitrophenol	495.3	33	666.7	0	74.3	15-130	0			
2,4-Dinitrotoluene	647.3	33	666.7	0	97.1	50-115	0			
2,6-Dinitrotoluene	602.3	33	666.7	0	90.3	50-110	0			
2-Chloronaphthalene	507.7	6.7	666.7	0	76.1	45-105	0			
2-Chlorophenol	624.7	33	666.7	0	93.7	45-105	0			
2-Nitrophenol	552.7	33	666.7	0	82.9	40-110	0			
3,3´-Dichlorobenzidine	637.3	170	666.7	0	95.6	30-120	0			
4,6-Dinitro-2-methylphenol	592.7	33	666.7	0	88.9	40-130	0			
4-Bromophenyl phenyl ether	617.7	33	666.7	0	92.6	45-115	0			
4-Chloro-3-methylphenol	686	33	666.7	0	103	45-115	0			
4-Chlorophenyl phenyl ether	553.3	33	666.7	0	83	45-110	0			
4-Nitrophenol	730	33	666.7	0	109	15-140	0			
Acenaphthene	524.7	6.7	666.7	0	78.7	45-110	0			
Acenaphthylene	531.3	6.7	666.7	0	79.7	45-105	0			
Anthracene	662	6.7	666.7	0	99.3	55-105	0			
Benzo(a)anthracene	632	6.7	666.7	0	94.8	50-110	0			
Benzo(a)pyrene	648	6.7	666.7	0	97.2	50-110	0			
Benzo(b)fluoranthene	654.3	6.7	666.7	0	98.1	45-115	0			
Benzo(g,h,i)perylene	734.7	6.7	666.7	0	110	40-125	0			
Benzo(k)fluoranthene	657.7	6.7	666.7	0	98.6	45-115	0			
Bis(2-chloroethoxy)methane	574.7	33	666.7	0	86.2	45-110	0			
Bis(2-chloroethyl)ether	589.3	33	666.7	0	88.4	40-105	0			
Bis(2-chloroisopropyl)ether	642.7	33	666.7	0	96.4	20-115	0			
Bis(2-ethylhexyl)phthalate	638.7	33	666.7	0	95.8	45-125	0			
Butyl benzyl phthalate	617.7	33	666.7	0	92.6	50-125	0			
Chrysene	681.3	6.7	666.7	0	102	55-110	0			
Dibenzo(a,h)anthracene	716.7	6.7	666.7	0	107	40-125	0			
Diethyl phthalate	591	33	666.7	0	88.6	50-115	0			
Dimethyl phthalate	582	33	666.7	0	87.3	50-110	0			
Di-n-butyl phthalate	715	33	666.7	0	107	55-110	0			
Di-n-octyl phthalate	499	33	666.7	0	74.8	40-130	0			
Fluoranthene	734.3	6.7	666.7	0	110	55-115	0			
Fluorene	577	6.7	666.7	0	86.5	50-110	0			
Hexachlorobenzene	633	33	666.7	0	94.9	45-120	0			
Hexachlorobutadiene	538.7	33	666.7	0	80.8	40-115	0			
Hexachlorocyclopentadiene	343.7	33	666.7	0	51.5	40-115	0			
Hexachloroethane	532.7	33	666.7	0	79.9	35-110	0			
Indeno(1,2,3-cd)pyrene	731.3	6.7	666.7	0	110	40-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

Isophorone	568	170	666.7	0	85.2	45-110	0
Naphthalene	543.3	6.7	666.7	0	81.5	40-105	0
Nitrobenzene	597	170	666.7	0	89.5	40-115	0
N-Nitrosodimethylamine	596.7	170	666.7	0	89.5	20-115	0
N-Nitrosodi-n-propylamine	624	33	666.7	0	93.6	40-115	0
N-Nitrosodiphenylamine	639.7	33	666.7	0	95.9	50-115	0
Pentachlorophenol	629.7	33	666.7	0	94.4	25-120	0
Phenanthrene	638.3	6.7	666.7	0	95.7	50-110	0
Phenol	648	33	666.7	0	97.2	40-100	0
Pyrene	610.7	6.7	666.7	0	91.6	45-125	0
Surr: 2,4,6-Tribromophenol	*1578*	0	*1667*	0	*94.7*	*34-140*	0
Surr: 2-Fluorobiphenyl	*1233*	0	*1667*	0	*74*	*12-100*	0
Surr: 2-Fluorophenol	*1511*	0	*1667*	0	*90.6*	*33-117*	0
Surr: 4-Terphenyl-d14	*1429*	0	*1667*	0	*85.8*	*25-137*	0
Surr: Nitrobenzene-d5	*1464*	0	*1667*	0	*87.8*	*37-107*	0
Surr: Phenol-d6	*1551*	0	*1667*	0	*93.1*	*40-106*	0

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

MS Sample ID: **1604577-01B MS** Units: **µg/Kg** Analysis Date: **4/13/2016 08:21 PM**
Client ID: Run ID: **SVMS8_160413A** SeqNo: **3776153** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	615.6	33	660.9	0	93.1	55-115	0			
2,4,6-Trichlorophenol	567	33	660.9	0	85.8	45-110	0			
2,4-Dichlorophenol	634.1	33	660.9	0	95.9	45-110	0			
2,4-Dimethylphenol	617.9	33	660.9	0	93.5	30-105	0			
2,4-Dinitrophenol	497.6	33	660.9	0	75.3	15-130	0			
2,4-Dinitrotoluene	598.1	33	660.9	0	90.5	50-115	0			
2,6-Dinitrotoluene	571.6	33	660.9	0	86.5	50-110	0			
2-Chloronaphthalene	520.1	6.6	660.9	0	78.7	45-105	0			
2-Chlorophenol	567.7	33	660.9	0	85.9	45-105	0			
2-Nitrophenol	525.4	33	660.9	0	79.5	40-110	0			
3,3´-Dichlorobenzidine	301.7	170	660.9	0	45.6	30-120	0			
4,6-Dinitro-2-methylphenol	561.4	33	660.9	0	84.9	40-130	0			
4-Bromophenyl phenyl ether	606.3	33	660.9	0	91.7	45-115	0			
4-Chloro-3-methylphenol	660.8	33	660.9	0	100	45-115	0			
4-Chlorophenyl phenyl ether	545.8	33	660.9	0	82.6	45-110	0			
4-Nitrophenol	636.7	33	660.9	0	96.3	15-140	0			
Acenaphthene	601.7	6.6	660.9	126.2	72	45-110	0			
Acenaphthylene	546.8	6.6	660.9	4.552	82.1	45-105	0			
Anthracene	832	6.6	660.9	341.7	74.2	55-105	0			
Benzo(a)anthracene	1135	6.6	660.9	753.3	57.8	50-110	0			
Benzo(a)pyrene	1137	6.6	660.9	683.7	68.6	50-110	0			
Benzo(b)fluoranthene	1341	6.6	660.9	1030	47.1	45-115	0			
Benzo(g,h,i)perylene	969.8	6.6	660.9	472.1	75.3	40-125	0			
Benzo(k)fluoranthene	945.3	6.6	660.9	335.9	92.2	45-115	0			
Bis(2-chloroethoxy)methane	524	33	660.9	0	79.3	45-110	0			
Bis(2-chloroethyl)ether	516.4	33	660.9	0	78.1	40-105	0			
Bis(2-chloroisopropyl)ether	558.1	33	660.9	0	84.4	20-115	0			
Bis(2-ethylhexyl)phthalate	742.1	33	660.9	0	112	45-125	0			
Butyl benzyl phthalate	751	33	660.9	0	114	50-125	0			
Chrysene	1156	6.6	660.9	807	52.8	55-110	0			S
Dibenzo(a,h)anthracene	687.3	6.6	660.9	115.1	86.6	40-125	0			
Diethyl phthalate	529.3	33	660.9	0	80.1	50-115	0			
Dimethyl phthalate	537.9	33	660.9	0	81.4	50-110	0			
Di-n-butyl phthalate	674	33	660.9	0	102	55-110	0			
Di-n-octyl phthalate	692.2	33	660.9	0	105	40-130	0			
Fluoranthene	2091	6.6	660.9	1726	55.1	55-115	0			E
Fluorene	626.8	6.6	660.9	127.5	75.6	50-110	0			
Hexachlorobenzene	604	33	660.9	0	91.4	45-120	0			
Hexachlorobutadiene	507.8	33	660.9	0	76.8	40-115	0			
Hexachlorocyclopentadiene	384.3	33	660.9	0	58.1	40-115	0			
Hexachloroethane	476.1	33	660.9	0	72	35-110	0			
Indeno(1,2,3-cd)pyrene	1028	6.6	660.9	537.1	74.3	40-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

Isophorone	524.7	170	660.9	0	79.4	45-110	0	
Naphthalene	542.2	6.6	660.9	102.7	66.5	40-105	0	
Nitrobenzene	538.2	170	660.9	0	81.4	40-115	0	
N-Nitrosodimethylamine	512.5	170	660.9	0	77.5	20-115	0	
N-Nitrosodi-n-propylamine	542.5	33	660.9	0	82.1	40-115	0	
N-Nitrosodiphenylamine	611.9	33	660.9	0	92.6	50-115	0	
Pentachlorophenol	621.5	33	660.9	0	94	25-120	0	
Phenanthrene	1344	6.6	660.9	1211	20.2	50-110	0	S
Phenol	611.9	33	660.9	0	92.6	40-100	0	
Pyrene	1840	6.6	660.9	1313	79.8	45-125	0	
Surr: 2,4,6-Tribromophenol	*1503*	0	*1652*	0	*91*	*34-140*	0	
Surr: 2-Fluorobiphenyl	*1222*	0	*1652*	0	*73.9*	*12-100*	0	
Surr: 2-Fluorophenol	*1317*	0	*1652*	0	*79.7*	*33-117*	0	
Surr: 4-Terphenyl-d14	*1589*	0	*1652*	0	*96.2*	*25-137*	0	
Surr: Nitrobenzene-d5	*1305*	0	*1652*	0	*79*	*37-107*	0	
Surr: Phenol-d6	*1416*	0	*1652*	0	*85.7*	*40-106*	0	

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

MSD Sample ID: **1604577-01B MSD** Units: **µg/Kg** Analysis Date: **4/13/2016 08:42 PM**

Client ID: Run ID: **SVMS8_160413A** SeqNo: **3776154** Prep Date: **4/13/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	641.1	32	656.5	0	97.6	55-115	615.6	4.06	30	
2,4,6-Trichlorophenol	578.4	32	656.5	0	88.1	45-110	567	1.99	30	
2,4-Dichlorophenol	621.4	32	656.5	0	94.6	45-110	634.1	2.02	30	
2,4-Dimethylphenol	600.4	32	656.5	0	91.4	30-105	617.9	2.88	30	
2,4-Dinitrophenol	453.6	32	656.5	0	69.1	15-130	497.6	9.24	30	
2,4-Dinitrotoluene	577.1	32	656.5	0	87.9	50-115	598.1	3.57	30	
2,6-Dinitrotoluene	584.3	32	656.5	0	89	50-110	571.6	2.19	30	
2-Chloronaphthalene	521.9	6.6	656.5	0	79.5	45-105	520.1	0.353	30	
2-Chlorophenol	564.3	32	656.5	0	85.9	45-105	567.7	0.6	30	
2-Nitrophenol	548.5	32	656.5	0	83.5	40-110	525.4	4.31	30	
3,3´-Dichlorobenzidine	312.2	160	656.5	0	47.5	30-120	301.7	3.42	30	
4,6-Dinitro-2-methylphenol	547.2	32	656.5	0	83.3	40-130	561.4	2.56	30	
4-Bromophenyl phenyl ether	626.9	32	656.5	0	95.5	45-115	606.3	3.35	30	
4-Chloro-3-methylphenol	641.4	32	656.5	0	97.7	45-115	660.8	2.99	30	
4-Chlorophenyl phenyl ether	535	32	656.5	0	81.5	45-110	545.8	2	30	
4-Nitrophenol	591.5	32	656.5	0	90.1	15-140	636.7	7.36	30	
Acenaphthene	572.1	6.6	656.5	126.2	67.9	45-110	601.7	5.04	30	
Acenaphthylene	536.7	6.6	656.5	4.552	81.1	45-105	546.8	1.87	30	
Anthracene	738.6	6.6	656.5	341.7	60.4	55-105	832	11.9	30	
Benzo(a)anthracene	964.4	6.6	656.5	753.3	32.1	50-110	1135	16.3	30	S
Benzo(a)pyrene	1011	6.6	656.5	683.7	49.8	50-110	1137	11.8	30	S
Benzo(b)fluoranthene	1125	6.6	656.5	1030	14.5	45-115	1341	17.6	30	S
Benzo(g,h,i)perylene	905	6.6	656.5	472.1	65.9	40-125	969.8	6.91	30	
Benzo(k)fluoranthene	816.3	6.6	656.5	335.9	73.2	45-115	945.3	14.6	30	
Bis(2-chloroethoxy)methane	522.9	32	656.5	0	79.6	45-110	524	0.218	30	
Bis(2-chloroethyl)ether	534.7	32	656.5	0	81.4	40-105	516.4	3.48	30	
Bis(2-chloroisopropyl)ether	554.7	32	656.5	0	84.5	20-115	558.1	0.599	30	
Bis(2-ethylhexyl)phthalate	1070	32	656.5	0	163	45-125	742.1	36.2	30	SR
Butyl benzyl phthalate	703.4	32	656.5	0	107	50-125	751	6.55	30	
Chrysene	1004	6.6	656.5	807	30	55-110	1156	14.1	30	S
Dibenzo(a,h)anthracene	646.6	6.6	656.5	115.1	81	40-125	687.3	6.09	30	
Diethyl phthalate	501.9	32	656.5	0	76.4	50-115	529.3	5.32	30	
Dimethyl phthalate	529.5	32	656.5	0	80.6	50-110	537.9	1.58	30	
Di-n-butyl phthalate	618.1	32	656.5	0	94.1	55-110	674	8.66	30	
Di-n-octyl phthalate	571.1	32	656.5	0	87	40-130	692.2	19.2	30	
Fluoranthene	1472	6.6	656.5	1726	-38.7	55-115	2091	34.7	30	SR
Fluorene	589.5	6.6	656.5	127.5	70.4	50-110	626.8	6.13	30	
Hexachlorobenzene	609.2	32	656.5	0	92.8	45-120	604	0.861	30	
Hexachlorobutadiene	507.5	32	656.5	0	77.3	40-115	507.8	0.0748	30	
Hexachlorocyclopentadiene	368.6	32	656.5	0	56.1	40-115	384.3	4.16	30	
Hexachloroethane	492.7	32	656.5	0	75	35-110	476.1	3.42	30	
Indeno(1,2,3-cd)pyrene	936.2	6.6	656.5	537.1	60.8	40-120	1028	9.34	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Batch ID: **84645** Instrument ID **SVMS8** Method: **SW8270C**

Isophorone	535.4	160	656.5	0	81.5	45-110	524.7	2.01	30	
Naphthalene	514.7	6.6	656.5	102.7	62.7	40-105	542.2	5.21	30	
Nitrobenzene	540.3	160	656.5	0	82.3	40-115	538.2	0.38	30	
N-Nitrosodimethylamine	521.9	160	656.5	0	79.5	20-115	512.5	1.82	30	
N-Nitrosodi-n-propylamine	543.6	32	656.5	0	82.8	40-115	542.5	0.19	30	
N-Nitrosodiphenylamine	621	32	656.5	0	94.6	50-115	611.9	1.48	30	
Pentachlorophenol	584.9	32	656.5	0	89.1	25-120	621.5	6.06	30	
Phenanthrene	1127	6.6	656.5	1211	-12.9	50-110	1344	17.6	30	S
Phenol	598.1	32	656.5	0	91.1	40-100	611.9	2.29	30	
Pyrene	1649	6.6	656.5	1313	51.3	45-125	1840	10.9	30	
Surr: 2,4,6-Tribromophenol	*1497*	0	*1641*	0	*91.2*	*34-140*	1503	*0.373*	*40*	
Surr: 2-Fluorobiphenyl	*1217*	0	*1641*	0	*74.1*	*12-100*	1222	*0.389*	*40*	
Surr: 2-Fluorophenol	*1300*	0	*1641*	0	*79.2*	*33-117*	1317	*1.31*	*40*	
Surr: 4-Terphenyl-d14	*1591*	0	*1641*	0	*97*	*25-137*	1589	*0.128*	*40*	
Surr: Nitrobenzene-d5	*1330*	0	*1641*	0	*81*	*37-107*	1305	*1.92*	*40*	
Surr: Phenol-d6	*1374*	0	*1641*	0	*83.7*	*40-106*	1416	*3.04*	*40*	

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84608** Instrument ID **VMS6** Method: **SW8260B**

MBLK Sample ID: **MBLK-84608-84608** Units: **µg/Kg-dry** Analysis Date: **4/12/2016 01:10 PM**
Client ID: Run ID: **VMS6_160412A** SeqNo: **3773819** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	U	30								
1,1,2,2-Tetrachloroethane	U	30								
1,1,2-Trichloroethane	U	30								
1,1-Dichloroethane	U	30								
1,1-Dichloroethene	U	30								
1,2-Dichlorobenzene	U	30								
1,2-Dichloroethane	U	30								
1,2-Dichloropropane	U	30								
1,3-Dichlorobenzene	U	30								
1,4-Dichlorobenzene	U	30								
Acrolein	U	200								
Acrylonitrile	U	100								
Benzene	U	30								
Bromodichloromethane	U	30								
Bromoform	U	30								
Bromomethane	U	75								
Carbon tetrachloride	U	30								
Chlorobenzene	U	30								
Chloroethane	U	100								
Chloroform	U	30								
Chloromethane	U	100								
cis-1,2-Dichloroethene	U	30								
cis-1,3-Dichloropropene	U	30								
Dibromochloromethane	U	30								
Ethylbenzene	U	30								
Methylene chloride	U	30								
Tetrachloroethene	U	30								
Toluene	U	30								
trans-1,2-Dichloroethene	U	30								
trans-1,3-Dichloropropene	U	30								
Trichloroethene	U	30								
Vinyl chloride	U	30								
Surr: 1,2-Dichloroethane-d4	*927.5*	0	*1000*	0	*92.8*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*952*	0	*1000*	0	*95.2*	*70-130*	0			
Surr: Dibromofluoromethane	*1018*	0	*1000*	0	*102*	*70-130*	0			
Surr: Toluene-d8	*998.5*	0	*1000*	0	*99.8*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84608** Instrument ID **VMS6** Method: **SW8260B**

LCS Sample ID: **LCS-84608-84608** Units: **µg/Kg-dry** Analysis Date: **4/12/2016 11:55 AM**
Client ID: Run ID: **VMS6_160412A** SeqNo: **3773818** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	1146	30	1000	0	115	70-135	0			
1,1,2,2-Tetrachloroethane	1134	30	1000	0	113	55-130	0			
1,1,2-Trichloroethane	1142	30	1000	0	114	60-125	0			
1,1-Dichloroethane	1032	30	1000	0	103	75-125	0			
1,1-Dichloroethene	973.5	30	1000	0	97.4	65-135	0			
1,2-Dichlorobenzene	1171	30	1000	0	117	75-120	0			
1,2-Dichloroethane	1083	30	1000	0	108	70-135	0			
1,2-Dichloropropane	1056	30	1000	0	106	70-120	0			
1,3-Dichlorobenzene	1200	30	1000	0	120	70-125	0			
1,4-Dichlorobenzene	1161	30	1000	0	116	70-125	0			
Acrylonitrile	849	100	1000	0	84.9	70-135	0			
Benzene	1161	30	1000	0	116	75-125	0			
Bromodichloromethane	1022	30	1000	0	102	70-130	0			
Bromoform	890	30	1000	0	89	55-135	0			
Bromomethane	1780	75	1000	0	178	30-160	0			S
Carbon tetrachloride	1092	30	1000	0	109	65-135	0			
Chlorobenzene	1162	30	1000	0	116	75-125	0			
Chloroethane	985.5	100	1000	0	98.6	40-155	0			
Chloroform	1028	30	1000	0	103	70-125	0			
Chloromethane	1212	100	1000	0	121	50-130	0			
cis-1,2-Dichloroethene	994.5	30	1000	0	99.4	65-125	0			
cis-1,3-Dichloropropene	1105	30	1000	0	110	70-125	0			
Dibromochloromethane	952.5	30	1000	0	95.2	65-135	0			
Ethylbenzene	1163	30	1000	0	116	75-125	0			
Methylene chloride	977.5	30	1000	0	97.8	55-145	0			
Tetrachloroethene	1214	30	1000	0	121	64-140	0			
Toluene	1123	30	1000	0	112	70-125	0			
trans-1,2-Dichloroethene	1020	30	1000	0	102	65-135	0			
trans-1,3-Dichloropropene	972.5	30	1000	0	97.2	65-125	0			
Trichloroethene	1065	30	1000	0	106	75-125	0			
Vinyl chloride	1029	30	1000	0	103	60-125	0			
Surr: 1,2-Dichloroethane-d4	*958*	0	*1000*	0	*95.8*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*986*	0	*1000*	0	*98.6*	*70-130*	0			
Surr: Dibromofluoromethane	*1034*	0	*1000*	0	*103*	*70-130*	0			
Surr: Toluene-d8	*990.5*	0	*1000*	0	*99*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84608** Instrument ID **VMS6** Method: **SW8260B**

MS Sample ID: **1604566-01A MS** Units: **µg/Kg-dry** Analysis Date: **4/14/2016 08:57 PM**
Client ID: Run ID: **VMS9_160414A** SeqNo: **3777539** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	1361	46	1532	0	88.8	70-135	0			
1,1,2,2-Tetrachloroethane	1575	46	1532	0	103	55-130	0			
1,1,2-Trichloroethane	1521	46	1532	0	99.3	60-125	0			
1,1-Dichloroethane	1349	46	1532	0	88	75-125	0			
1,1-Dichloroethene	1317	46	1532	0	86	65-135	0			
1,2-Dichlorobenzene	1436	46	1532	0	93.8	75-120	0			
1,2-Dichloroethane	1518	46	1532	0	99.1	70-135	0			
1,2-Dichloropropane	1484	46	1532	0	96.9	70-120	0			
1,3-Dichlorobenzene	1466	46	1532	0	95.7	70-125	0			
1,4-Dichlorobenzene	1439	46	1532	0	94	70-125	0			
Acrylonitrile	1650	150	1532	0	108	70-135	0			
Benzene	1404	46	1532	0	91.6	75-125	0			
Bromodichloromethane	1306	46	1532	0	85.2	70-130	0			
Bromoform	1361	46	1532	0	88.8	55-135	0			
Bromomethane	662.4	110	1532	0	43.2	30-160	0			
Carbon tetrachloride	1270	46	1532	0	83	65-135	0			
Chlorobenzene	1451	46	1532	0	94.8	75-125	0			
Chloroethane	779.6	150	1532	0	50.9	40-155	0			
Chloroform	1362	46	1532	0	88.9	70-125	0			
Chloromethane	1290	150	1532	0	84.2	50-130	0			
cis-1,2-Dichloroethene	1314	46	1532	0	85.8	65-125	0			
cis-1,3-Dichloropropene	1373	46	1532	0	89.6	70-125	0			
Dibromochloromethane	1251	46	1532	0	81.6	65-135	0			
Ethylbenzene	1415	46	1532	0	92.4	75-125	0			
Methylene chloride	1429	46	1532	0	93.3	55-145	0			
Tetrachloroethene	1990	46	1532	0	130	64-140	0			
Toluene	1378	46	1532	0	90	70-125	0			
trans-1,2-Dichloroethene	1339	46	1532	0	87.4	65-135	0			
trans-1,3-Dichloropropene	1202	46	1532	0	78.5	65-125	0			
Trichloroethene	1496	46	1532	0	97.7	75-125	0			
Vinyl chloride	1305	46	1532	0	85.2	60-125	0			
Surr: 1,2-Dichloroethane-d4	*1581*	0	*1532*	0	*103*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1637*	0	*1532*	0	*107*	*70-130*	0			
Surr: Dibromofluoromethane	*1529*	0	*1532*	0	*99.8*	*70-130*	0			
Surr: Toluene-d8	*1475*	0	*1532*	0	*96.3*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84608** Instrument ID **VMS6** Method: **SW8260B**

MSD Sample ID: **1604566-01A MSD** Units: **µg/Kg-dry** Analysis Date: **4/14/2016 09:23 PM**
Client ID: Run ID: **VMS9_160414A** SeqNo: **3777540** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	1412	46	1532	0	92.2	70-135	1361	3.7	30	
1,1,2,2-Tetrachloroethane	1585	46	1532	0	104	55-130	1575	0.63	30	
1,1,2-Trichloroethane	1521	46	1532	0	99.3	60-125	1521	0	30	
1,1-Dichloroethane	1440	46	1532	0	94	75-125	1349	6.54	30	
1,1-Dichloroethene	1472	46	1532	0	96.1	65-135	1317	11.1	30	
1,2-Dichlorobenzene	1536	46	1532	0	100	75-120	1436	6.75	30	
1,2-Dichloroethane	1545	46	1532	0	101	70-135	1518	1.75	30	
1,2-Dichloropropane	1544	46	1532	0	101	70-120	1484	3.95	30	
1,3-Dichlorobenzene	1570	46	1532	0	102	70-125	1466	6.86	30	
1,4-Dichlorobenzene	1520	46	1532	0	99.2	70-125	1439	5.49	30	
Acrylonitrile	1725	150	1532	0	113	70-135	1650	4.4	30	
Benzene	1483	46	1532	0	96.8	75-125	1404	5.47	30	
Bromodichloromethane	1363	46	1532	0	89	70-130	1306	4.3	30	
Bromoform	1344	46	1532	0	87.8	55-135	1361	1.25	30	
Bromomethane	794.9	110	1532	0	51.9	30-160	662.4	18.2	30	
Carbon tetrachloride	1306	46	1532	0	85.2	65-135	1270	2.73	30	
Chlorobenzene	1515	46	1532	0	98.9	75-125	1451	4.29	30	
Chloroethane	827.9	150	1532	0	54	40-155	779.6	6	30	
Chloroform	1495	46	1532	0	97.6	70-125	1362	9.33	30	
Chloromethane	1405	150	1532	0	91.8	50-130	1290	8.52	30	
cis-1,2-Dichloroethene	1404	46	1532	0	91.6	65-125	1314	6.59	30	
cis-1,3-Dichloropropene	1427	46	1532	0	93.2	70-125	1373	3.88	30	
Dibromochloromethane	1301	46	1532	0	85	65-135	1251	3.96	30	
Ethylbenzene	1494	46	1532	0	97.6	75-125	1415	5.42	30	
Methylene chloride	1532	46	1532	0	100	55-145	1429	6.98	30	
Tetrachloroethene	2331	46	1532	0	152	64-140	1990	15.8	30	S
Toluene	1467	46	1532	0	95.8	70-125	1378	6.25	30	
trans-1,2-Dichloroethene	1460	46	1532	0	95.3	65-135	1339	8.59	30	
trans-1,3-Dichloropropene	1280	46	1532	0	83.6	65-125	1202	6.23	30	
Trichloroethene	1568	46	1532	0	102	75-125	1496	4.65	30	
Vinyl chloride	1507	46	1532	0	98.4	60-125	1305	14.4	30	
Surr: 1,2-Dichloroethane-d4	*1509*	0	*1532*	0	*98.6*	*70-130*	1581	*4.61*	*30*	
Surr: 4-Bromofluorobenzene	*1621*	0	*1532*	0	*106*	*70-130*	1637	*0.987*	*30*	
Surr: Dibromofluoromethane	*1431*	0	*1532*	0	*93.4*	*70-130*	1529	*6.57*	*30*	
Surr: Toluene-d8	*1462*	0	*1532*	0	*95.4*	*70-130*	1475	*0.887*	*30*	

The following samples were analyzed in this batch: 1604500-01A 1604500-02A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84548** Instrument ID **LACHAT2** Method: **A4500-NH3 G-97**

MBLK Sample ID: **MBLK-84548-84548** Units: **mg NH3-N/Kg** Analysis Date: **4/11/2016 01:48 PM**
Client ID: Run ID: **LACHAT2_160411E** SeqNo: **3770247** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	4.846	15								JX

LCS Sample ID: **LCS-84548-84548** Units: **mg NH3-N/Kg** Analysis Date: **4/11/2016 01:48 PM**
Client ID: Run ID: **LACHAT2_160411E** SeqNo: **3770248** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	43.01	15	50	0	86	70-130	0			X

MS Sample ID: **1604279-01A MS** Units: **mg NH3-N/Kg** Analysis Date: **4/11/2016 01:48 PM**
Client ID: Run ID: **LACHAT2_160411E** SeqNo: **3770267** Prep Date: **4/11/2016** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	715.7	210	35.71	768.7	-148	70-130	0			SOX

MSD Sample ID: **1604279-01A MSD** Units: **mg NH3-N/Kg** Analysis Date: **4/11/2016 01:48 PM**
Client ID: Run ID: **LACHAT2_160411E** SeqNo: **3770268** Prep Date: **4/11/2016** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	719.6	190	31.65	768.7	-155	70-130	715.7	0.544	30	SOX

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84551** Instrument ID **WETCHEM** Method: **SW9045D**

LCS Sample ID: **LCS-84551-84551** Units: **s.u.** Analysis Date: **4/11/2016 02:20 PM**
Client ID: Run ID: **WETCHEM_160411F** SeqNo: **3769990** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	3.96	0	4	0	99	90-110	0			

DUP Sample ID: **1604500-01C DUP** Units: **s.u.** Analysis Date: **4/11/2016 02:20 PM**
Client ID: **RCK001:D-1:D000130** Run ID: **WETCHEM_160411F** SeqNo: **3769992** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	8.8	0	0	0	0	0-0	8.75	0.57	20	

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84554** Instrument ID **GALLERY** Method: **A4500-Cl E-97**

MBLK Sample ID: **MBLK-84554-84554** Units: **mg/Kg** Analysis Date: **4/15/2016 11:45 AM**
Client ID: Run ID: **GALLERY_160415A** SeqNo: **3778243** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	10								

MS Sample ID: **1604507-02B MS** Units: **mg/Kg** Analysis Date: **4/15/2016 11:45 AM**
Client ID: Run ID: **GALLERY_160415A** SeqNo: **3778262** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	485.3	9.9	494.1	8.081	96.6	75-125	0			

MSD Sample ID: **1604507-02B MSD** Units: **mg/Kg** Analysis Date: **4/15/2016 11:45 AM**
Client ID: Run ID: **GALLERY_160415A** SeqNo: **3778263** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	477.8	9.9	494.1	8.081	95.1	75-125	485.3	1.56	25	

LCS1 Sample ID: **LCS1-84554-84554** Units: **mg/Kg** Analysis Date: **4/15/2016 11:45 AM**
Client ID: Run ID: **GALLERY_160415A** SeqNo: **3778252** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	105.2	10	100	0	105	80-120	0			

LCS2 Sample ID: **LCS2-84554-84554** Units: **mg/Kg** Analysis Date: **4/15/2016 11:45 AM**
Client ID: Run ID: **GALLERY_160415A** SeqNo: **3778261** Prep Date: **4/11/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	498.5	10	500	0	99.7	80-120	0			

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84581** Instrument ID **WETCHEM** Method: **A4500-NO2 B**

MBLK Sample ID: **MBLK-84581-84581** Units: **mg/Kg** Analysis Date: **4/12/2016 12:00 PM**
Client ID: Run ID: **WETCHEM_160412H** SeqNo: **3771797** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	U	0.70								

LCS Sample ID: **LCS-84581-84581** Units: **mg/Kg** Analysis Date: **4/12/2016 12:00 PM**
Client ID: Run ID: **WETCHEM_160412H** SeqNo: **3771798** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	2.188	0.70	2	0	109	80-120	0			

MS Sample ID: **1604279-01A MS** Units: **mg/Kg** Analysis Date: **4/12/2016 12:00 PM**
Client ID: Run ID: **WETCHEM_160412H** SeqNo: **3771800** Prep Date: **4/12/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	7.1	2.3	3.215	2.524	142	75-125	0			S

MSD Sample ID: **1604279-01A MSD** Units: **mg/Kg** Analysis Date: **4/12/2016 12:00 PM**
Client ID: Run ID: **WETCHEM_160412H** SeqNo: **3771801** Prep Date: **4/12/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	6.849	2.3	3.215	2.524	135	75-125	7.1	3.6	20	S

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84582** Instrument ID **LACHAT2** Method: **E353.2**

MBLK Sample ID: **MBLK-84582-84582** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413F** SeqNo: **3775185** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	U	1.0								

LCS Sample ID: **LCS-84582-84582** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413F** SeqNo: **3775188** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	52.68	1.0	50	0	105	80-120	0			

MS Sample ID: **1604279-01A MS** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413F** SeqNo: **3775190** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	45.85	0.96	47.98	2.583	90.2	75-125	0			

MSD Sample ID: **1604279-01A MSD** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413F** SeqNo: **3775191** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	53.03	0.95	47.71	2.583	106	75-125	45.85	14.5	35	

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84583** Instrument ID **LACHAT2** Method: **E365.1 R2.0**

MBLK Sample ID: **MBLK-84583-84583** Units: **mg/Kg** Analysis Date: **4/12/2016 11:19 AM**
Client ID: Run ID: **LACHAT2_160412H** SeqNo: **3772523** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	U	5.0								

LCS Sample ID: **LCS-84583-84583** Units: **mg/Kg** Analysis Date: **4/12/2016 11:19 AM**
Client ID: Run ID: **LACHAT2_160412H** SeqNo: **3772524** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	10.74	5.0	10	0	107	90-110	0			

MS Sample ID: **1604279-01A MS** Units: **mg/Kg** Analysis Date: **4/12/2016 11:19 AM**
Client ID: Run ID: **LACHAT2_160412H** SeqNo: **3772526** Prep Date: **4/12/2016** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	1210	390	15.67	1278	-431	90-110	0			SO

MSD Sample ID: **1604279-01A MSD** Units: **mg/Kg** Analysis Date: **4/12/2016 11:19 AM**
Client ID: Run ID: **LACHAT2_160412H** SeqNo: **3772527** Prep Date: **4/12/2016** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	1254	380	15.06	1278	-158	90-110	1210	3.55	20	SO

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84584** Instrument ID **LACHAT2** Method: **E353.2**

MBLK Sample ID: **MBLK-84584-84584** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413G** SeqNo: **3775334** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	U	1.0								

LCS Sample ID: **LCS-84584-84584** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413G** SeqNo: **3775335** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	52.05	1.0	50	0	104	80-120	0			

MS Sample ID: **1604422-01A MS** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413G** SeqNo: **3775337** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	40.44	0.86	42.81	0.07438	94.3	75-125	0			

MSD Sample ID: **1604422-01A MSD** Units: **mg/Kg** Analysis Date: **4/13/2016 11:59 AM**
Client ID: Run ID: **LACHAT2_160413G** SeqNo: **3775338** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	42.03	0.84	42.09	0.07438	99.7	75-125	40.44	3.86	35	

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84585** Instrument ID **LACHAT2** Method: **A4500-P E-97**

MBLK	Sample ID: **MBLK-84585-84585**				Units: **mg/Kg**			Analysis Date: **4/12/2016 10:22 AM**			
Client ID:	Run ID: **LACHAT2_160412C**				SeqNo: **3772144**			Prep Date: **4/12/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	U	1.0								

LCS	Sample ID: **LCS-84585-84585**				Units: **mg/Kg**			Analysis Date: **4/12/2016 10:22 AM**			
Client ID:	Run ID: **LACHAT2_160412C**				SeqNo: **3772145**			Prep Date: **4/12/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	10.4	1.0	10	0	104	90-110	0			

MS	Sample ID: **1604500-01C MS**				Units: **mg/Kg**			Analysis Date: **4/12/2016 10:22 AM**			
Client ID: **RCK001:D-1:D000130**	Run ID: **LACHAT2_160412C**				SeqNo: **3772152**			Prep Date: **4/12/2016**		DF: **2**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	38.62	2.8	13.77	26.29	89.6	90-110	0			S

MSD	Sample ID: **1604500-01C MSD**				Units: **mg/Kg**			Analysis Date: **4/12/2016 10:22 AM**			
Client ID: **RCK001:D-1:D000130**	Run ID: **LACHAT2_160412C**				SeqNo: **3772153**			Prep Date: **4/12/2016**		DF: **2**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	36.77	2.5	12.53	26.29	83.6	90-110	38.62	4.92	20	S

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84616** Instrument ID **LACHAT** Method: **A4500-NH3 G-97**

MBLK Sample ID: **MBLK-84616-84616** Units: **mg/Kg** Analysis Date: **4/13/2016 09:41 AM**
Client ID: Run ID: **LACHAT_160413B** SeqNo: **3773878** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	U	5.0								

LCS Sample ID: **LCS-84616-84616** Units: **mg/Kg** Analysis Date: **4/13/2016 09:41 AM**
Client ID: Run ID: **LACHAT_160413B** SeqNo: **3773879** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	99.26	5.0	100	0	99.3	80-120	0			

MS Sample ID: **1604279-01A MS** Units: **mg/Kg** Analysis Date: **4/13/2016 09:41 AM**
Client ID: Run ID: **LACHAT_160413B** SeqNo: **3773881** Prep Date: **4/12/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	2498	76	152.9	1906	388	75-125	0			SO

MSD Sample ID: **1604279-01A MSD** Units: **mg/Kg** Analysis Date: **4/13/2016 09:41 AM**
Client ID: Run ID: **LACHAT_160413B** SeqNo: **3773882** Prep Date: **4/12/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	2376	76	151.5	1906	310	75-125	2498	5.04	35	SO

LCS2 Sample ID: **LCS2-84616-84616** Units: **mg/Kg** Analysis Date: **4/13/2016 09:41 AM**
Client ID: Run ID: **LACHAT_160413B** SeqNo: **3773887** Prep Date: **4/12/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	99.38	5.0	100	0	99.4	80-120	0			

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84652** Instrument ID **WETCHEM** Method: **E410.4 R2.0**

MBLK	Sample ID: **MB-84652-84652**			Units: **mg/Kg**			Analysis Date: **4/12/2016 10:50 AM**			
Client ID:	Run ID: **WETCHEM_160412Q**			SeqNo: **3773313**			Prep Date: **4/11/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	U	500								

LCS	Sample ID: **LCS-84652-84652**			Units: **mg/Kg**			Analysis Date: **4/12/2016 10:50 AM**			
Client ID:	Run ID: **WETCHEM_160412Q**			SeqNo: **3773314**			Prep Date: **4/11/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	6201	500	6000	0	103	90-110	0			

MS	Sample ID: **1604500-01C MS**			Units: **mg/Kg**			Analysis Date: **4/12/2016 10:50 AM**			
Client ID: **RCK001:D-1:D000130**	Run ID: **WETCHEM_160412Q**			SeqNo: **3773316**			Prep Date: **4/11/2016**		DF: **2**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	5615	900	5376	130.6	102	80-120	0			

MSD	Sample ID: **1604500-01C MSD**			Units: **mg/Kg**			Analysis Date: **4/12/2016 10:50 AM**			
Client ID: **RCK001:D-1:D000130**	Run ID: **WETCHEM_160412Q**			SeqNo: **3773317**			Prep Date: **4/11/2016**		DF: **2**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	5669	900	5386	130.6	103	80-120	5615	0.949	20	

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **84721** Instrument ID **LACHAT** Method: **SW9012B**

MBLK	Sample ID: **MBLK-84721-84721**				Units: **mg/Kg**			Analysis Date: **4/14/2016 09:54 AM**			
Client ID:	Run ID: **LACHAT_160414D**				SeqNo: **3776323**			Prep Date: **4/14/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	U	0.50								

MBLK	Sample ID: **MBLK-84721-84721**				Units: **mg/Kg**			Analysis Date: **4/14/2016 09:54 AM**			
Client ID:	Run ID: **LACHAT_160414D**				SeqNo: **3776331**			Prep Date: **4/14/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	U	0.50								

LCS	Sample ID: **LCS-84721-84721**				Units: **mg/Kg**			Analysis Date: **4/14/2016 09:54 AM**			
Client ID:	Run ID: **LACHAT_160414D**				SeqNo: **3776324**			Prep Date: **4/14/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.321	0.50	2.5	0	92.8	85-119	0			

LCS	Sample ID: **LCS-84721-84721**				Units: **mg/Kg**			Analysis Date: **4/14/2016 09:54 AM**			
Client ID:	Run ID: **LACHAT_160414D**				SeqNo: **3776332**			Prep Date: **4/14/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.321	0.50	2.5	0	92.8	85-119	0			

MS	Sample ID: **1604343-01A MS**				Units: **mg/Kg**			Analysis Date: **4/14/2016 09:54 AM**			
Client ID:	Run ID: **LACHAT_160414D**				SeqNo: **3776334**			Prep Date: **4/14/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.032	0.50	2.5	0.3915	65.6	70-130	0			S

MSD	Sample ID: **1604343-01A MSD**				Units: **mg/Kg**			Analysis Date: **4/14/2016 09:54 AM**			
Client ID:	Run ID: **LACHAT_160414D**				SeqNo: **3776335**			Prep Date: **4/14/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.155	0.50	2.51	0.3915	70.2	70-130	2.032	5.86	30	

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **R185116** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R185116** Units: **% of sample** Analysis Date: **4/10/2016 03:56 PM**
Client ID: Run ID: **MOIST_160410A** SeqNo: **3769793** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	U	0.050								

LCS Sample ID: **LCS-R185116** Units: **% of sample** Analysis Date: **4/10/2016 03:56 PM**
Client ID: Run ID: **MOIST_160410A** SeqNo: **3769792** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1604507-01B DUP** Units: **% of sample** Analysis Date: **4/10/2016 03:56 PM**
Client ID: Run ID: **MOIST_160410A** SeqNo: **3769783** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	15.56	0.050	0	0	0		15.84	1.78	20	

DUP Sample ID: **1604507-04B DUP** Units: **% of sample** Analysis Date: **4/10/2016 03:56 PM**
Client ID: Run ID: **MOIST_160410A** SeqNo: **3769787** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	13.03	0.050	0	0	0		13.28	1.9	20	

The following samples were analyzed in this batch: 1604500-01B 1604500-02B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

Client: Hull & Associates, Inc.
Work Order: 1604500
Project: RCK001

QC BATCH REPORT

Batch ID: **R185282** Instrument ID **WETCHEM** Method: **TITRAMETRIC**

MBLK Sample ID: **WBLKS1-160413-R185282** Units: **% by wt** Analysis Date: **4/13/2016 10:20 AM**
Client ID: Run ID: **WETCHEM_160413D** SeqNo: **3774130** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	U	0.025								

LCS Sample ID: **WLCSS1-160413-R185282** Units: **% by wt** Analysis Date: **4/13/2016 10:20 AM**
Client ID: Run ID: **WETCHEM_160413D** SeqNo: **3774131** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	0.1034	0.025	0.1	0	103	70-110	0			

MS Sample ID: **1604500-01C MS** Units: **% by wt** Analysis Date: **4/13/2016 10:20 AM**
Client ID: **RCK001:D-1:D000130** Run ID: **WETCHEM_160413D** SeqNo: **3774184** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	0.7158	0.025	0.4219	0.2796	103	70-110	0			

MSD Sample ID: **1604500-01C MSD** Units: **% by wt** Analysis Date: **4/13/2016 10:20 AM**
Client ID: **RCK001:D-1:D000130** Run ID: **WETCHEM_160413D** SeqNo: **3774185** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	0.7323	0.025	0.4149	0.2796	109	70-110	0.7158	2.27	20	

The following samples were analyzed in this batch: 1604500-01C 1604500-02C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Revision: 1

1604500

PAGE 1 OF 1

NO. 1450

HULL

CHAIN OF CUSTODY RECORD

Dublin, OH ☐	Indianapolis, IN ☐	Mason, OH ☐	Bedford, OH ☐	Toledo, OH ☒	St. Clairsville, OH ☐	Pittsburgh, PA ☐
6397 Emerald Pkwy	8445 Keystone Crossing	4770 Duke Dr.	4 Hemisphere Way	3401 Glendale Ave.	146 W. Main St.	Campbells Run Business Center
Suite 200	Suite 135	Suite 300	Bedford, OH 44146	Suite 300	2nd Floor	300 Business Center Dr., Suite 320
Dublin, OH 43016	Indianapolis, IN 46240	Mason, OH 45040	P: (440) 232-8945	Toledo, OH 43614	St. Clairsville, OH 43950	Pittsburgh, PA 15205
P: (614) 793-8777	P: (800) 241-7173	P: (513) 459-9677		P: (419) 385-2018	P: (800) 241-7173	P: (412) 446-0315

REPORT TO: Matt Bell

Client: Rocky Ridge

Site: City of Toledo Lagoons

Project #: RCLC001 Phase:

Samplers: Scott Stanley

Purchase Order #

SAMPLE MATRIX
AA-AMBIENT AIR
C-ASBESTOS
D-SEDIMENT
G-GROUNDWATER
IA-INDOOR AIR
L-LEACHATE
P-PRODUCT
S-SOIL
SG-SOIL GAS
SS-SUBSLAB VAPOR
W-WATER
X-CONCRETE

PRESERVATIVES
A-Cool only, <4 deg. C
B-HNO_3 pH<2
C-H_2SO_4 pH<2
D-NaOH pH>12
E-ZnAcetate + NaOH, pH>9
F-$Na_2S_2O_3$ (0.008%)
G-HCL pH <2
H-EDTA
I-5ml 1:1 HCL
J-none
K-Stored in dark
L-NH_4Cl
M-Methanol
S-Sodium

METALS
N - Not filtered
F45u- filtered with 0.45 micron
F5u- filtered with 5 micron

ANALYSES / PRESERVATIVES

PROJECT NO. : SAMPLE LOCATION : SAMPLE MATRIX & ID	NO. OF CONT.	SAMPLE TYPE (discrete, composite)	COLLECTION DATE/TIME	METALS	See Attached Analyte List	COMMENTS
RCLC001 : D-1 : D000130	5	composite	4-7-16 / 1645	N	X	
RCLC001 : D-1 : D000130A	5	Composite	4-7-16 / 1645	N	X	
: :			/			
: :			/			
: :			/			
: :			/			
: :			/			
: :			/			
: :			/			
: :			/			
: :			/			

RELINQUISHED BY:	DATE: 4-8-16	RECEIVED BY:	DATE: 4-8-16	Deliver To: ALS
RELINQUISHED BY:	TIME: 09:50	RECEIVED BY:	TIME: 0950	Method of Delivery: Fed Ex
RELINQUISHED BY:	DATE: 4-8-16	RECEIVED BY: FedEx / Shipper	DATE: 4-8-16	Airbill Number: 22-F.le.
	TIME: 1700		TIME: 1700	Regulatory Program:
	DATE:	RECEIVED BY:	DATE: 4/9/16	Required Limits:
	TIME:		TIME: 0930	

COOLER TEMPERATURE AS RECEIVED 2.2°C

DISTRIBUTION: WHITE -LAB USE (MUST BE RETURNED WITH REPORT)
YELLOW -LAB USE
PINK -RETAINED BY HULL

NOTES: Ohio VAP, EPA Region 9 RSLs

TURN AROUND TIME: Standard DAYS

Table 1
Summary of Totals and Geotechnical Analyses for Spent Lime

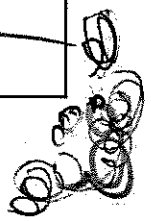
Chemical Sampling Parameter	Lab Chemical Sampling Method	# of Samples	Applicable Target Standards
pH	SW9045D	3 composite samples per lagoon (9 total samples); Chemical Only - 1 Duplicate Sample and 1 Field/Equipment Blank	1. Ohio Voluntary Action Program (VAP) - Residential Category 2. USEPA Region 9 Regional Screening Levels Residential Category 3. Ohio Background Metals (Cox and Colvin)
Organic Carbon - Walkley-Black	TITRAMETRIC		
Chemical Oxygen Demand	E410.4 R2.0		
Biochemical Oxygen Demand	A5210B-97		
Chloride	A4500-Cl E-97		
Metals by ICP-MS Na, Mg, K	SW6020A		
Nitrogen, Total Kjeldahl	A4500-NH3 G-97		
Nitrogen, Total	Calculation		
Nitrogen, Total Inorganic	Calculation		
Nitrogen, Total Organic	Calculation		
Nitrogen, Nitrite	A4500-NO2 B		
Nitrogen, Nitrate	E353.2		
Nitrogen, Nitrate-Nitrite	E353.2		
Ammonia as Nitrogen	A4500-NH3 G-97		
Phosphorus, Total	E365.1 R2.0		
Phosphorus, Ortho-P (As P)	A4500-P E-97		
Priority Pollutant VOCs	SW8260B		
Priority Pollutant SVOCs	SW8270C		
PCBs	SW8082		
Priority Pollutant Pesticides	SW8081A		
Cyanide, Total	SW9012B		
Metals by ICP-MS	SW6020A		
Priority Pollutant Metals, Mercury by CVAA	SW7471A		
Geotechnical Sampling Parameter	**Geotechnical Sampling Method**		**Applicable Target Standards**
USCS: Particle Size	~~ASTM D2487 / ASTM D422~~		~~Not Applicable~~
Moisture Content by Mass	~~ASTM D2216~~		
Liquid Limit	ASTM D4318		
Plastic Limit			

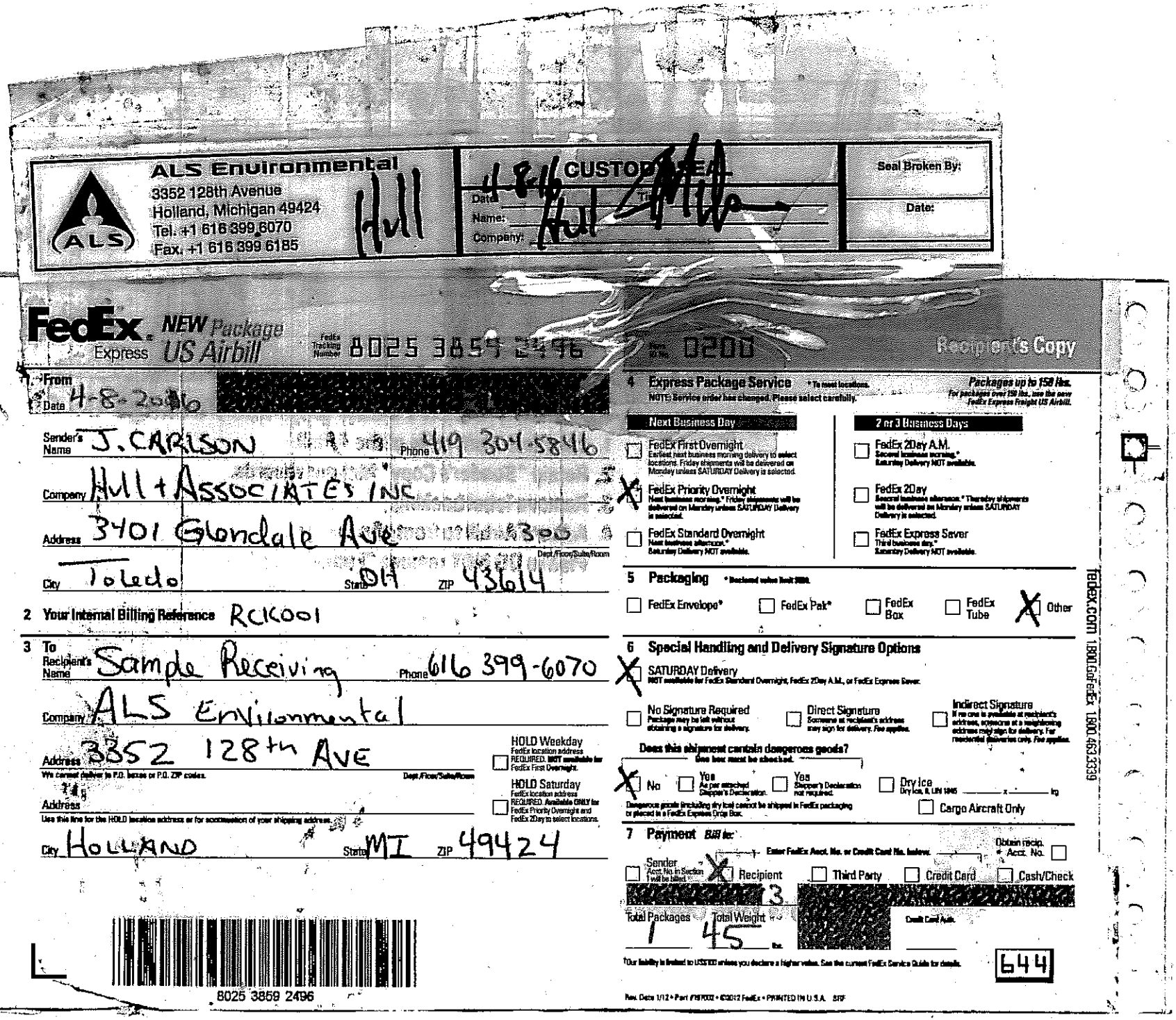
Notes

1. Rocky Ridge will collect, pack, and ship 3 composite samples from each lagoon to the analytical laboratory. Each composite sample will characterize the entire depth of lime material. See Figure 2 for proposed sampling locations.

2. Rocky Ridge will collect five (5) buckets of the lime from each lagoon (15 total buckets) for use in preparing lime/soil blends for further testing. Each lagoon should be appropriately labeled (e.g., Lagoon D-1, Lagoon D-2, etc.)

3. Rocky Ridge will be responsible for all data collection, field reports and general documentation of field activities during the lime characterization.





ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
Tel. +1 616 399 6070
Fax. +1 616 399 6185

Hull

CUSTODY SEAL
Date: 4-8-16
Name: Hull
Company:

Seal Broken By:
Date:

FedEx Express NEW Package US Airbill

FedEx Tracking Number 8025 3859 2496

Acct. 0200

Recipient's Copy

1 From
Date 4-8-2016
Sender's Name J. CARLSON Phone 419 304-5816
Company HULL + ASSOCIATES INC
Address 3401 Glendale Ave
Dept./Floor/Suite/Room
City Toledo State OH ZIP 43614

2 Your Internal Billing Reference RCIC001

3 To
Recipient's Name Sample Receiving Phone 616 399-6070
Company ALS Environmental
Address 3352 128th Ave
We cannot deliver to P.O. boxes or P.O. ZIP codes.
Dept./Floor/Suite/Room
Address
Use this line for the HOLD location address or for continuation of your shipping address.
City HOLLAND State MI ZIP 49424

HOLD Weekday
FedEx location address REQUIRED. NOT available for FedEx First Overnight.
HOLD Saturday
FedEx location address REQUIRED. Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

4 Express Package Service * To most locations.
NOTE: Service order has changed. Please select carefully.
Packages up to 150 lbs.
For packages over 150 lbs., use the new FedEx Express Freight US Airbill.

Next Business Day
- [ ] FedEx First Overnight — Earliest next business morning delivery to select locations. Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [X] FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

2 or 3 Business Days
- [ ] FedEx 2Day A.M. — Second business morning.* Saturday Delivery NOT available.
- [ ] FedEx 2Day — Second business afternoon.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- [ ] FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

5 Packaging * Declared value limit $500.
- [ ] FedEx Envelope*
- [ ] FedEx Pak*
- [ ] FedEx Box
- [ ] FedEx Tube
- [X] Other

6 Special Handling and Delivery Signature Options
- [X] SATURDAY Delivery — NOT available for FedEx Standard Overnight, FedEx 2Day A.M., or FedEx Express Saver.

Signature options:
- [ ] No Signature Required — Package may be left without obtaining a signature for delivery.
- [ ] Direct Signature — Someone at recipient's address may sign for delivery. Fee applies.
- [ ] Indirect Signature — If no one is available at recipient's address, someone at a neighboring address may sign for delivery. For residential deliveries only. Fee applies.

Does this shipment contain dangerous goods?
One box must be checked.
- [X] No
- [ ] Yes — As per attached Shipper's Declaration
- [ ] Yes — Shipper's Declaration not required.
- [ ] Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.
- [ ] Cargo Aircraft Only

7 Payment Bill to:
Enter FedEx Acct. No. or Credit Card No. below.
Obtain recip. Acct. No. [ ]
- [ ] Sender — Acct. No. in Section 1 will be billed.
- [X] Recipient
- [ ] Third Party
- [ ] Credit Card
- [ ] Cash/Check

Total Packages 1
Total Weight 45 lbs.
Credit Card Auth.

*Our liability is limited to US$100 unless you declare a higher value. See the current FedEx Service Guide for details.

644

8025 3859 2496

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fedex.com 1.800.GoFedEx 1.800.463.3339

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **HULL&ASSOC-TOLEDO** Date/Time Received: **09-Apr-16 09:30**

Work Order: **1604500** Received by: **DS**

Checklist completed by Diane Shaw (eSignature) 09-Apr-16 (Date) Reviewed by: Bill Carey (eSignature) 19-Apr-16 (Date)

Matrices: Soil

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.2/2.2 c	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/9/2016 11:11:12 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

26-May-2016

Matt Beil
Hull & Associates, Inc.
3401 Glendale Ave
Suite 300
Toledo, OH 43614

Re: **RCK001** Work Order: **1605959**

Dear Matt,

ALS Environmental received 9 samples on 17-May-2016 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 96.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Certificate No: OH: CL 103

Report of Laboratory Analysis

ALS Group USA, Corp

Date: 26-May-16

Client: Hull & Associates, Inc.
Project: RCK001
Work Order: **1605959**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1605959-01	RCK001:50/50:SB16-1160-1	Soil	50/50	5/16/2016 12:30	5/17/2016 09:00	☐
1605959-02	RCK001:66/33:SB16-1161-1	Soil	66/33	5/16/2016 13:00	5/17/2016 09:00	☐
1605959-03	RCK001:33/66:SB16-1162-1	Soil	33/66	5/16/2016 13:30	5/17/2016 09:00	☐
1605959-04	RCK001:50/50:SB16-1160-2	Soil	50/50	5/16/2016 12:30	5/17/2016 09:00	☐
1605959-05	RCK001:50/50:SB16-1160-3	Soil	50/50	5/16/2016 12:30	5/17/2016 09:00	☐
1605959-06	RCK001:66/33:SB16-1161-2	Soil	66/33	5/16/2016 13:00	5/17/2016 09:00	☐
1605959-07	RCK001:66/33:SB16-1161-3	Soil	66/33	5/16/2016 13:00	5/17/2016 09:00	☐
1605959-08	RCK001:33/66:SB16-1162-2	Soil	33/66	5/16/2016 13:30	5/17/2016 09:00	☐
1605959-09	RCK001:33/66:SB16-1162-3	Soil	33/66	5/16/2016 13:30	5/17/2016 09:00	☐

ALS Group USA, Corp

Date: 26-May-16

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Project: RCK001
WorkOrder: **1605959**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and PQL, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight
s.u.	Standard Units

Client: Hull & Associates, Inc.
Project: RCK001
Work Order: 1605959

Case Narrative

Samples for the above noted Work Order were received on xx/yy/zzzz. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

With the following exceptions, all sample analyses achieved analytical criteria.

Volatile Organics:
Batch 86325, Method VOC_8260A_OVAP_S, Sample 1605959-02A MS: The MS recovery was above the upper control limit. The corresponding result in the parent sample was non-detect, therefore no qualification is necessary: Multiple analytes

Batch 86325, Method VOC_8260A_OVAP_S, Sample 1605959-02A MSD: The RPD between the MS and MSD was outside the control limit. The corresponding result in the parent sample should be considered estimated for this analyte: Acetone, 2-Butanone

Batch 86325, Method VOC_8260A_OVAP_S, Sample 1605959-02A MSD: The MSD recovery was above the upper control limit. The corresponding result in the parent sample was non-detect, therefore no qualification is necessary: Multiple analytes

Batch 86325, Method VOC_8260A_OVAP_S, Sample LCS-86325: The LCS recovery was above the upper control limit. All the sample results in the batch were non-detect. No qualification is necessary for this analyte. 1,2-Dibromoethane, Methyl iodide

Extractable Organics:
Batch 86269, Method PEST_8081A_OVAP_S, Sample 1605959-01B: The reporting limit is elevated due to dilution needed to eliminate matrix-related interference for this analyte: All - Samples required dilution due to yellow color of the sample extract.

Batch 86269, Method PEST_8081A_OVAP_S, Sample 1605959-02B: The reporting limit is elevated due to dilution needed to eliminate matrix-related interference for this analyte: All - Samples required dilution due to yellow color of the sample extract.

Batch 86269, Method PEST_8081A_OVAP_S, Sample 1605959-03B: The reporting limit is elevated due to dilution needed to eliminate matrix-related interference for this analyte: All - Samples required dilution due to yellow color of the sample extract.

Batch 86269, Method PEST_8081A_OVAP_S, Sample 1605959-04B: The reporting limit is elevated due to dilution needed to eliminate matrix-related interference for this analyte: All - Samples required dilution due to yellow color of the sample extract.

Batch 86269, Method PEST_8081A_OVAP_S, Sample 1605959-05B: The reporting limit is elevated due to dilution needed to eliminate matrix-related interference for this analyte: All - Samples required dilution due to yellow color of the sample extract.

Batch 86269, Method PEST_8081A_OVAP_S, Sample 1605959-06B: The reporting limit is elevated due to dilution needed to eliminate matrix-related interference for this analyte: All - Samples required dilution due to yellow color of the sample extract.

Batch 86269, Method PEST_8081A_OVAP_S, Sample 1605959-07B: The reporting limit is elevated due to dilution needed to eliminate matrix-related interference for this analyte: All - Samples required dilution due to yellow color of the sample extract.

Batch 86269, Method PEST_8081A_OVAP_S, Sample 1605959-08B: The reporting limit is elevated due to dilution needed to eliminate matrix-related interference for this analyte: All - Samples required dilution due to yellow color of the sample extract.

Batch 86269, Method PEST_8081A_OVAP_S, Sample 1605959-09B: The reporting limit is elevated due to dilution needed to eliminate matrix-related interference for this analyte: All - Samples required dilution due to yellow color of the sample extract.

Batch 86269, Method PEST_8081A_OVAP_S, Sample PLCSS1-86269: The LCS recovery was above the upper control limit. All the sample results in the batch were non-detect. No qualification is necessary for this analyte. 4,4' DDT, Dieldrin

Batch 86393, Method SVO_8270C_OVAP_S, Sample 1605959-07B MSD: The MSD recovery was below the lower control limit. The corresponding result in the parent sample may be biased low for this analyte: Hexachlorocyclopentadiene

Batch 86393, Method SVO_8270C_OVAP_S, Sample 1605959-07B MSD: The RPD between the MS and MSD was outside the control limit. The corresponding result in the parent sample should be considered estimated for this analyte: Hexachlorocyclopentadiene

Metals:

Batch 86340, Method ICP_6020A_OVAP_S, Sample 1605959-07BMS: The MS recovery was below the lower control limit. The corresponding result in the parent sample may be biased low for this analyte: Cu

Batch 86340, Method ICP_6020A_OVAP_S, Sample 1605959-07BMS: The MS recovery was above the upper control limit. The corresponding result in the parent sample may be biased high for this analyte: As

Batch 86340, Method ICP_6020A_OVAP_S, Sample 1605959-07BMS: The MS recovery was outside of the control limit; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte: Ni, Zn

Batch 86340, Method ICP_6020A_OVAP_S, Sample 1605959-07BMSD: The MSD recovery was outside of the control limit; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte: Ni, Zn

Batch 86343, Method ICP_6020_S, Sample 1605959-07BMS: The MS recovery was above the upper control limit. The corresponding result in the parent sample may be biased high for this analyte: K

Batch 86343, Method ICP_6020_S, Sample 1605959-07BMS: The MS recovery was outside of the control limit; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte: Mg

Batch 86343, Method ICP_6020_S, Sample 1605959-07BMSD: The MSD recovery was above the upper control limit. The corresponding result in the parent sample may be biased high for this analyte: K

Batch 86343, Method ICP_6020_S, Sample 1605959-07BMSD: The MSD recovery was outside of the control limit; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte: Mg

Wet Chemistry:
Batch 86226, Method BOD_5210B_S, Sample 1605959-01B: The sample dilutions set up for BOD analysis did not meet the oxygen depletion criteria of at least 2 mg/L. The result should be considered estimated.

Batch 86226, Method BOD_5210B_S, Sample 1605959-02B: The sample dilutions set up for BOD analysis did not meet the oxygen depletion criteria of at least 2 mg/L. The result should be considered estimated.

Batch 86226, Method BOD_5210B_S, Sample 1605959-03B: The sample dilutions set up for

BOD analysis did not meet the oxygen depletion criteria of at least 2 mg/L. The result should be considered estimated.

Batch 86226, Method BOD_5210B_S, Sample 1605959-04B: The sample dilutions set up for BOD analysis did not meet the oxygen depletion criteria of at least 2 mg/L. The result should be considered estimated.

Batch 86226, Method BOD_5210B_S, Sample 1605959-05B: The sample dilutions set up for BOD analysis did not meet the oxygen depletion criteria of at least 2 mg/L. The result should be considered estimated.

Batch 86226, Method BOD_5210B_S, Sample 1605959-06B: The sample dilutions set up for BOD analysis did not meet the oxygen depletion criteria of at least 2 mg/L. The result should be considered estimated.

Batch 86226, Method BOD_5210B_S, Sample 1605959-07B: The sample dilutions set up for BOD analysis did not meet the oxygen depletion criteria of at least 2 mg/L. The result should be considered estimated.

Batch 86226, Method BOD_5210B_S, Sample 1605959-08B: The sample dilutions set up for BOD analysis did not meet the oxygen depletion criteria of at least 2 mg/L. The result should be considered estimated.

Batch 86226, Method BOD_5210B_S, Sample 1605959-09B: The sample dilutions set up for BOD analysis did not meet the oxygen depletion criteria of at least 2 mg/L. The result should be considered estimated.

Batch 86334, Method PASC_365.1_S, Sample 1605959-01B MS: The MS recovery was outside of the control limit; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte.

Batch 86334, Method PASC_365.1_S, Sample 1605959-01B MSD: The MSD recovery was outside of the control limit; however, the result in the parent sample is greater than 4x the spike amount. No qualification is required for this analyte.

Batch 86413, Method NH3_4500BG_S, Sample 1605959-01B MS: The MS recovery was below the lower control limit. The corresponding result in the parent sample may be biased low for this analyte.

Batch 86413, Method NH3_4500BG_S, Sample 1605959-01B MSD: The MSD recovery was below the lower control limit. The corresponding result in the parent sample may be biased low for this analyte.

Batch 86418, Method TKN_4500N_S, Sample 1605959-01B MSD: The MSD recovery was below the lower control limit. The corresponding result in the parent sample may be biased low for this analyte.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-1
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 5/19/16		Analyst: **EB**
Aroclor 1016	U		14	120	µg/Kg-dry	1	5/21/2016 14:58
Aroclor 1221	U		14	120	µg/Kg-dry	1	5/21/2016 14:58
Aroclor 1232	U		14	120	µg/Kg-dry	1	5/21/2016 14:58
Aroclor 1242	U		14	120	µg/Kg-dry	1	5/21/2016 14:58
Aroclor 1248	U		14	120	µg/Kg-dry	1	5/21/2016 14:58
Aroclor 1254	U		17	120	µg/Kg-dry	1	5/21/2016 14:58
Aroclor 1260	U		17	120	µg/Kg-dry	1	5/21/2016 14:58
Surr: Decachlorobiphenyl	*79.1*			*40-140*	*%REC*	1	5/21/2016 14:58
Surr: Tetrachloro-m-xylene	*76.1*			*45-124*	*%REC*	1	5/21/2016 14:58
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 5/19/16		Analyst: **BLM**
4,4´-DDD	U		3.8	28	µg/Kg-dry	2	5/20/2016 15:39
4,4´-DDE	U		5.9	28	µg/Kg-dry	2	5/20/2016 15:39
4,4´-DDT	U		5.1	28	µg/Kg-dry	2	5/20/2016 15:39
Aldrin	U		4.4	28	µg/Kg-dry	2	5/20/2016 15:39
alpha-BHC	U		3.0	28	µg/Kg-dry	2	5/20/2016 15:39
alpha-Chlordane	U		4.8	28	µg/Kg-dry	2	5/20/2016 15:39
beta-BHC	U		10	28	µg/Kg-dry	2	5/20/2016 15:39
Chlordane, Technical	U		21	71	µg/Kg-dry	2	5/20/2016 15:39
delta-BHC	U		4.4	28	µg/Kg-dry	2	5/20/2016 15:39
Dieldrin	U		5.9	28	µg/Kg-dry	2	5/20/2016 15:39
Endosulfan I	U		3.7	28	µg/Kg-dry	2	5/20/2016 15:39
Endosulfan II	U		6.4	28	µg/Kg-dry	2	5/20/2016 15:39
Endosulfan sulfate	U		5.1	28	µg/Kg-dry	2	5/20/2016 15:39
Endrin	U		4.8	28	µg/Kg-dry	2	5/20/2016 15:39
Endrin aldehyde	U		11	28	µg/Kg-dry	2	5/20/2016 15:39
gamma-BHC (Lindane)	U		4.0	28	µg/Kg-dry	2	5/20/2016 15:39
Heptachlor	U		4.4	28	µg/Kg-dry	2	5/20/2016 15:39
Heptachlor epoxide	U		4.0	28	µg/Kg-dry	2	5/20/2016 15:39
Toxaphene	U		21	170	µg/Kg-dry	2	5/20/2016 15:39
Surr: Decachlorobiphenyl	*78.1*			*45-135*	*%REC*	2	5/20/2016 15:39
Surr: Tetrachloro-m-xylene	*76.1*			*45-124*	*%REC*	2	5/20/2016 15:39
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 5/20/16		Analyst: **LR**
Mercury	**0.026**		**0.0034**	**0.020**	**mg/Kg-dry**	1	5/23/2016 22:26
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Magnesium	**16,000**		**4.5**	**190**	**mg/Kg-dry**	10	5/21/2016 22:58
Potassium	**1,700**		**7.4**	**190**	**mg/Kg-dry**	10	5/21/2016 22:58
Sodium	**170**	J	**39**	**190**	**mg/Kg-dry**	10	5/21/2016 22:58

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-1
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Antimony	**0.37**	J	**0.058**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:52
Arsenic	**9.3**		**0.76**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:52
Beryllium	**0.55**	J	**0.078**	**1.9**	**mg/Kg-dry**	10	5/21/2016 03:52
Cadmium	**0.31**	J	**0.078**	**1.9**	**mg/Kg-dry**	10	5/21/2016 03:52
Chromium	**17**		**0.78**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:52
Copper	**22**		**0.25**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:52
Lead	**12**		**0.12**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:52
Nickel	**31**		**0.84**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:52
Selenium	**1.6**	J	**0.76**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:52
Silver	U		0.14	4.9	mg/Kg-dry	10	5/21/2016 03:52
Thallium	**0.36**	J	**0.14**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:52
Zinc	**69**		**1.9**	**9.7**	**mg/Kg-dry**	10	5/21/2016 03:52
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 5/23/16		Analyst: **RS**
1,2-Diphenylhydrazine	U		4.0	47	µg/Kg-dry	1	5/24/2016 21:07
2,4,6-Trichlorophenol	U		9.3	47	µg/Kg-dry	1	5/24/2016 21:07
2,4-Dichlorophenol	U		9.8	47	µg/Kg-dry	1	5/24/2016 21:07
2,4-Dimethylphenol	U		11	47	µg/Kg-dry	1	5/24/2016 21:07
2,4-Dinitrophenol	U		14	47	µg/Kg-dry	1	5/24/2016 21:07
2,4-Dinitrotoluene	U		7.0	47	µg/Kg-dry	1	5/24/2016 21:07
2,6-Dinitrotoluene	U		10	47	µg/Kg-dry	1	5/24/2016 21:07
2-Chloronaphthalene	U		2.6	9.6	µg/Kg-dry	1	5/24/2016 21:07
2-Chlorophenol	U		8.5	47	µg/Kg-dry	1	5/24/2016 21:07
2-Nitrophenol	U		13	47	µg/Kg-dry	1	5/24/2016 21:07
3,3´-Dichlorobenzidine	U		60	240	µg/Kg-dry	1	5/24/2016 21:07
4,6-Dinitro-2-methylphenol	U		6.9	47	µg/Kg-dry	1	5/24/2016 21:07
4-Bromophenyl phenyl ether	U		7.0	47	µg/Kg-dry	1	5/24/2016 21:07
4-Chloro-3-methylphenol	U		7.0	47	µg/Kg-dry	1	5/24/2016 21:07
4-Chlorophenyl phenyl ether	U		8.4	47	µg/Kg-dry	1	5/24/2016 21:07
4-Nitrophenol	U		7.3	47	µg/Kg-dry	1	5/24/2016 21:07
Acenaphthene	U		3.6	9.6	µg/Kg-dry	1	5/24/2016 21:07
Acenaphthylene	U		2.9	9.6	µg/Kg-dry	1	5/24/2016 21:07
Anthracene	**8.6**	J	**4.6**	**9.6**	**µg/Kg-dry**	1	5/24/2016 21:07
Benzidine	U		49	240	µg/Kg-dry	1	5/24/2016 21:07
Benzo(a)anthracene	**36**		**5.8**	**9.6**	**µg/Kg-dry**	1	5/24/2016 21:07
Benzo(a)pyrene	**17**		**2.0**	**9.6**	**µg/Kg-dry**	1	5/24/2016 21:07
Benzo(b)fluoranthene	**34**		**3.3**	**9.6**	**µg/Kg-dry**	1	5/24/2016 21:07
Benzo(g,h,i)perylene	**19**		**4.2**	**9.6**	**µg/Kg-dry**	1	5/24/2016 21:07
Benzo(k)fluoranthene	**12**		**6.0**	**9.6**	**µg/Kg-dry**	1	5/24/2016 21:07

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-1
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		4.8	47	µg/Kg-dry	1	5/24/2016 21:07
Bis(2-chloroethyl)ether	U		5.3	47	µg/Kg-dry	1	5/24/2016 21:07
Bis(2-chloroisopropyl)ether	U		24	47	µg/Kg-dry	1	5/24/2016 21:07
Bis(2-ethylhexyl)phthalate	U		15	47	µg/Kg-dry	1	5/24/2016 21:07
Butyl benzyl phthalate	U		13	47	µg/Kg-dry	1	5/24/2016 21:07
Chrysene	**32**		**8.1**	**9.6**	**µg/Kg-dry**	1	5/24/2016 21:07
Dibenzo(a,h)anthracene	U		3.1	9.6	µg/Kg-dry	1	5/24/2016 21:07
Diethyl phthalate	U		6.1	47	µg/Kg-dry	1	5/24/2016 21:07
Dimethyl phthalate	**26**	J	**4.7**	**47**	**µg/Kg-dry**	1	5/24/2016 21:07
Di-n-butyl phthalate	U		13	47	µg/Kg-dry	1	5/24/2016 21:07
Di-n-octyl phthalate	U		13	47	µg/Kg-dry	1	5/24/2016 21:07
Fluoranthene	**71**		**5.9**	**9.6**	**µg/Kg-dry**	1	5/24/2016 21:07
Fluorene	U		5.3	9.6	µg/Kg-dry	1	5/24/2016 21:07
Hexachlorobenzene	U		7.7	47	µg/Kg-dry	1	5/24/2016 21:07
Hexachlorobutadiene	U		8.6	47	µg/Kg-dry	1	5/24/2016 21:07
Hexachlorocyclopentadiene	U		12	47	µg/Kg-dry	1	5/24/2016 21:07
Hexachloroethane	U		20	47	µg/Kg-dry	1	5/24/2016 21:07
Indeno(1,2,3-cd)pyrene	**21**		**6.0**	**9.6**	**µg/Kg-dry**	1	5/24/2016 21:07
Isophorone	U		8.5	240	µg/Kg-dry	1	5/24/2016 21:07
Naphthalene	**35**		**2.5**	**9.6**	**µg/Kg-dry**	1	5/24/2016 21:07
Nitrobenzene	U		10	240	µg/Kg-dry	1	5/24/2016 21:07
N-Nitrosodimethylamine	U		43	240	µg/Kg-dry	1	5/24/2016 21:07
N-Nitrosodi-n-propylamine	U		9.5	47	µg/Kg-dry	1	5/24/2016 21:07
N-Nitrosodiphenylamine	U		7.2	47	µg/Kg-dry	1	5/24/2016 21:07
Pentachlorophenol	U		16	47	µg/Kg-dry	1	5/24/2016 21:07
Phenanthrene	**56**		**5.3**	**9.6**	**µg/Kg-dry**	1	5/24/2016 21:07
Phenol	U		9.5	47	µg/Kg-dry	1	5/24/2016 21:07
Pyrene	**58**		**7.2**	**9.6**	**µg/Kg-dry**	1	5/24/2016 21:07
Surr: 2,4,6-Tribromophenol	*86.5*			*34-140*	*%REC*	1	5/24/2016 21:07
Surr: 2-Fluorobiphenyl	*69.8*			*12-100*	*%REC*	1	5/24/2016 21:07
Surr: 2-Fluorophenol	*99.5*			*33-117*	*%REC*	1	5/24/2016 21:07
Surr: 4-Terphenyl-d14	*105*			*25-137*	*%REC*	1	5/24/2016 21:07
Surr: Nitrobenzene-d5	*69.9*			*37-107*	*%REC*	1	5/24/2016 21:07
Surr: Phenol-d6	*91.0*			*40-106*	*%REC*	1	5/24/2016 21:07
VOLATILE ORGANICS - METHANOL CORRECTED		Method: **SW8260A**			Prep: SW5030A / 5/20/16		Analyst: **BG**
1,1,1-Trichloroethane	U		16	57	µg/Kg-dry	1	5/20/2016 15:31
1,1,2,2-Tetrachloroethane	U		14	57	µg/Kg-dry	1	5/20/2016 15:31
1,1,2-Trichloroethane	U		17	57	µg/Kg-dry	1	5/20/2016 15:31
1,1-Dichloroethane	U		14	57	µg/Kg-dry	1	5/20/2016 15:31

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-1
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		15	57	µg/Kg-dry	1	5/20/2016 15:31
1,2-Dichlorobenzene	U		17	57	µg/Kg-dry	1	5/20/2016 15:31
1,2-Dichloroethane	U		15	57	µg/Kg-dry	1	5/20/2016 15:31
1,2-Dichloropropane	U		16	57	µg/Kg-dry	1	5/20/2016 15:31
1,3-Dichlorobenzene	U		18	57	µg/Kg-dry	1	5/20/2016 15:31
1,4-Dichlorobenzene	U		15	57	µg/Kg-dry	1	5/20/2016 15:31
Acrolein	U		170	380	µg/Kg-dry	1	5/20/2016 15:31
Acrylonitrile	U		48	190	µg/Kg-dry	1	5/20/2016 15:31
Benzene	U		13	57	µg/Kg-dry	1	5/20/2016 15:31
Bromodichloromethane	U		15	57	µg/Kg-dry	1	5/20/2016 15:31
Bromoform	U		20	57	µg/Kg-dry	1	5/20/2016 15:31
Bromomethane	U		25	140	µg/Kg-dry	1	5/20/2016 15:31
Carbon tetrachloride	U		10	57	µg/Kg-dry	1	5/20/2016 15:31
Chlorobenzene	U		17	57	µg/Kg-dry	1	5/20/2016 15:31
Chloroethane	U		36	190	µg/Kg-dry	1	5/20/2016 15:31
Chloroform	U		19	57	µg/Kg-dry	1	5/20/2016 15:31
Chloromethane	U		23	190	µg/Kg-dry	1	5/20/2016 15:31
cis-1,2-Dichloroethene	U		16	57	µg/Kg-dry	1	5/20/2016 15:31
cis-1,3-Dichloropropene	U		22	57	µg/Kg-dry	1	5/20/2016 15:31
Dibromochloromethane	U		13	57	µg/Kg-dry	1	5/20/2016 15:31
Ethylbenzene	U		13	57	µg/Kg-dry	1	5/20/2016 15:31
Methylene chloride	U		26	57	µg/Kg-dry	1	5/20/2016 15:31
Tetrachloroethene	U		28	57	µg/Kg-dry	1	5/20/2016 15:31
Toluene	**23**	J	**19**	**57**	**µg/Kg-dry**	1	5/20/2016 15:31
trans-1,2-Dichloroethene	U		16	57	µg/Kg-dry	1	5/20/2016 15:31
trans-1,3-Dichloropropene	U		10	57	µg/Kg-dry	1	5/20/2016 15:31
Trichloroethene	U		15	57	µg/Kg-dry	1	5/20/2016 15:31
Vinyl chloride	U		18	57	µg/Kg-dry	1	5/20/2016 15:31
Surr: 1,2-Dichloroethane-d4	*95.9*			*70-120*	*%REC*	1	5/20/2016 15:31
Surr: 4-Bromofluorobenzene	*96.2*			*75-120*	*%REC*	1	5/20/2016 15:31
Surr: Dibromofluoromethane	*99.6*			*85-115*	*%REC*	1	5/20/2016 15:31
Surr: Toluene-d8	*98.0*			*85-120*	*%REC*	1	5/20/2016 15:31
BIOCHEMICAL OXYGEN DEMAND			Method: **A5210B-97**		Prep: A5210B / 5/19/16		Analyst: **JRF**
Biochemical Oxygen Demand	*<32.19*		14	14	mg/Kg-dry	1	5/24/2016 10:30
CHLORIDE			Method: **A4500-CL E-97**		Prep: EXTRACT / 5/18/16		Analyst: **ED**
Chloride	**29**		**1.6**	**14**	**mg/Kg-dry**	1	5/23/2016 20:30
CYANIDE, TOTAL			Method: **SW9012B**		Prep: SW9012B / 5/20/16		Analyst: **JB**
Cyanide, Total	**0.063**	J	**0.016**	**0.73**	**mg/Kg-dry**	1	5/25/2016 10:14

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-1
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND			Method: **E410.4 R2.0**		Prep: EXTRACT / 5/18/16		Analyst: **JJG**
Chemical Oxygen Demand	**450**	J	**130**	**730**	**mg/Kg-dry**	1	5/18/2016 12:25
MOISTURE			Method: **SW3550C**				Analyst: **EDL**
Moisture	**31**		**0.025**	**0.050**	**% of sample**	1	5/17/2016 18:35
NITROGEN, TOTAL			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total	**700**		**0**	**1.5**	**mg/Kg-dry**	1	5/24/2016 15:40
AMMONIA AS NITROGEN			Method: **A4500-NH3 G-97**		Prep: A4500-NH3 B / 5/23/16		Analyst: **JJG**
Ammonia as Nitrogen	**24**		**5.7**	**19**	**mg NH3-N/Kg-dry**	1	5/23/2016 14:37
NITROGEN, NITRITE			Method: **A4500-NO2 B**		Prep: EXTRACT / 5/20/16		Analyst: **LW**
Nitrogen, Nitrite	**0.048**	J	**0.012**	**1.0**	**mg/Kg-dry**	1	5/20/2016 15:15
NITROGEN, NITRATE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate	**0.80**	J	**0.068**	**1.4**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, NITRATE-NITRITE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**0.78**	J	**0.11**	**1.4**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, TOTAL INORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Inorganic	**26**		**0**	**0.029**	**mg/Kg-dry**	1	5/24/2016 15:50
NITROGEN, TOTAL ORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Organic	**670**		**1.5**	**1.5**	**mg/Kg-dry**	1	5/24/2016 15:40
PHOSPHORUS, TOTAL			Method: **E365.1 R2.0**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Total	**320**		**52**	**220**	**mg/Kg-dry**	30	5/20/2016 10:47
PH			Method: **SW9045D**		Prep: EXTRACT / 5/18/16		Analyst: **JB**
pH	**8.6**		**0**		**s.u.**	1	5/18/2016 13:30
PHOSPHORUS, ORTHO-P (AS P)			Method: **A4500-P E-97**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**1.6**		**0.68**	**1.5**	**mg/Kg-dry**	1	5/20/2016 13:29
NITROGEN, TOTAL KJELDAHL			Method: **A4500-NH3 G-97**		Prep: A4500-N B / 5/23/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**700**		**33**	**71**	**mg/Kg-dry**	10	5/24/2016 13:58
ORGANIC CARBON - WALKLEY-BLACK			Method: **TITRAMETRIC**				Analyst: **KF**
Organic Carbon - W-B	**0.91**		**0.017**	**0.036**	**% by wt-dry**	1	5/23/2016 12:10

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-1
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 5/19/16		Analyst: **EB**
Aroclor 1016	U		12	100	µg/Kg-dry	1	5/21/2016 15:50
Aroclor 1221	U		12	100	µg/Kg-dry	1	5/21/2016 15:50
Aroclor 1232	U		12	100	µg/Kg-dry	1	5/21/2016 15:50
Aroclor 1242	U		12	100	µg/Kg-dry	1	5/21/2016 15:50
Aroclor 1248	U		12	100	µg/Kg-dry	1	5/21/2016 15:50
Aroclor 1254	U		15	100	µg/Kg-dry	1	5/21/2016 15:50
Aroclor 1260	U		15	100	µg/Kg-dry	1	5/21/2016 15:50
Surr: Decachlorobiphenyl	*78.1*			*40-140*	*%REC*	1	5/21/2016 15:50
Surr: Tetrachloro-m-xylene	*72.1*			*45-124*	*%REC*	1	5/21/2016 15:50
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 5/19/16		Analyst: **BLM**
4,4´-DDD	U		3.2	24	µg/Kg-dry	2	5/20/2016 16:58
4,4´-DDE	U		5.0	24	µg/Kg-dry	2	5/20/2016 16:58
4,4´-DDT	U		4.4	24	µg/Kg-dry	2	5/20/2016 16:58
Aldrin	U		3.8	24	µg/Kg-dry	2	5/20/2016 16:58
alpha-BHC	U		2.5	24	µg/Kg-dry	2	5/20/2016 16:58
alpha-Chlordane	U		4.1	24	µg/Kg-dry	2	5/20/2016 16:58
beta-BHC	U		8.6	24	µg/Kg-dry	2	5/20/2016 16:58
Chlordane, Technical	U		18	61	µg/Kg-dry	2	5/20/2016 16:58
delta-BHC	U		3.8	24	µg/Kg-dry	2	5/20/2016 16:58
Dieldrin	U		5.1	24	µg/Kg-dry	2	5/20/2016 16:58
Endosulfan I	U		3.2	24	µg/Kg-dry	2	5/20/2016 16:58
Endosulfan II	U		5.5	24	µg/Kg-dry	2	5/20/2016 16:58
Endosulfan sulfate	U		4.3	24	µg/Kg-dry	2	5/20/2016 16:58
Endrin	U		4.1	24	µg/Kg-dry	2	5/20/2016 16:58
Endrin aldehyde	U		9.8	24	µg/Kg-dry	2	5/20/2016 16:58
gamma-BHC (Lindane)	U		3.4	24	µg/Kg-dry	2	5/20/2016 16:58
Heptachlor	U		3.8	24	µg/Kg-dry	2	5/20/2016 16:58
Heptachlor epoxide	U		3.4	24	µg/Kg-dry	2	5/20/2016 16:58
Toxaphene	U		18	150	µg/Kg-dry	2	5/20/2016 16:58
Surr: Decachlorobiphenyl	*72.1*			*45-135*	*%REC*	2	5/20/2016 16:58
Surr: Tetrachloro-m-xylene	*68.1*			*45-124*	*%REC*	2	5/20/2016 16:58
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 5/20/16		Analyst: **LR**
Mercury	**0.025**		**0.0028**	**0.017**	**mg/Kg-dry**	1	5/23/2016 22:35
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Magnesium	**15,000**		**4.6**	**200**	**mg/Kg-dry**	10	5/21/2016 23:05
Potassium	**1,700**		**7.5**	**200**	**mg/Kg-dry**	10	5/21/2016 23:05
Sodium	**140**	J	**40**	**200**	**mg/Kg-dry**	10	5/21/2016 23:05

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-1
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Antimony	**0.31**	J	**0.059**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:58
Arsenic	**8.5**		**0.77**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:58
Beryllium	**0.54**	J	**0.079**	**2.0**	**mg/Kg-dry**	10	5/21/2016 03:58
Cadmium	**0.28**	J	**0.079**	**2.0**	**mg/Kg-dry**	10	5/21/2016 03:58
Chromium	**18**		**0.79**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:58
Copper	**22**		**0.26**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:58
Lead	**11**		**0.12**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:58
Nickel	**28**		**0.85**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:58
Selenium	**1.7**	J	**0.77**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:58
Silver	U		0.14	4.9	mg/Kg-dry	10	5/21/2016 03:58
Thallium	**0.39**	J	**0.14**	**4.9**	**mg/Kg-dry**	10	5/21/2016 03:58
Zinc	**69**		**2.0**	**9.9**	**mg/Kg-dry**	10	5/21/2016 03:58
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 5/23/16		Analyst: **RS**
1,2-Diphenylhydrazine	U		3.4	41	µg/Kg-dry	1	5/23/2016 21:54
2,4,6-Trichlorophenol	U		8.0	41	µg/Kg-dry	1	5/23/2016 21:54
2,4-Dichlorophenol	U		8.4	41	µg/Kg-dry	1	5/23/2016 21:54
2,4-Dimethylphenol	U		9.7	41	µg/Kg-dry	1	5/23/2016 21:54
2,4-Dinitrophenol	U		12	41	µg/Kg-dry	1	5/23/2016 21:54
2,4-Dinitrotoluene	U		6.0	41	µg/Kg-dry	1	5/23/2016 21:54
2,6-Dinitrotoluene	U		8.6	41	µg/Kg-dry	1	5/23/2016 21:54
2-Chloronaphthalene	U		2.2	8.2	µg/Kg-dry	1	5/23/2016 21:54
2-Chlorophenol	U		7.3	41	µg/Kg-dry	1	5/23/2016 21:54
2-Nitrophenol	U		11	41	µg/Kg-dry	1	5/23/2016 21:54
3,3´-Dichlorobenzidine	U		52	200	µg/Kg-dry	1	5/23/2016 21:54
4,6-Dinitro-2-methylphenol	U		5.9	41	µg/Kg-dry	1	5/23/2016 21:54
4-Bromophenyl phenyl ether	U		6.0	41	µg/Kg-dry	1	5/23/2016 21:54
4-Chloro-3-methylphenol	U		6.0	41	µg/Kg-dry	1	5/23/2016 21:54
4-Chlorophenyl phenyl ether	U		7.2	41	µg/Kg-dry	1	5/23/2016 21:54
4-Nitrophenol	U		6.3	41	µg/Kg-dry	1	5/23/2016 21:54
Acenaphthene	U		3.1	8.2	µg/Kg-dry	1	5/23/2016 21:54
Acenaphthylene	U		2.5	8.2	µg/Kg-dry	1	5/23/2016 21:54
Anthracene	U		4.0	8.2	µg/Kg-dry	1	5/23/2016 21:54
Benzidine	U		42	200	µg/Kg-dry	1	5/23/2016 21:54
Benzo(a)anthracene	U		5.0	8.2	µg/Kg-dry	1	5/23/2016 21:54
Benzo(a)pyrene	U		1.7	8.2	µg/Kg-dry	1	5/23/2016 21:54
Benzo(b)fluoranthene	U		2.8	8.2	µg/Kg-dry	1	5/23/2016 21:54
Benzo(g,h,i)perylene	U		3.6	8.2	µg/Kg-dry	1	5/23/2016 21:54
Benzo(k)fluoranthene	U		5.1	8.2	µg/Kg-dry	1	5/23/2016 21:54

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-1
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		4.1	41	µg/Kg-dry	1	5/23/2016 21:54
Bis(2-chloroethyl)ether	U		4.5	41	µg/Kg-dry	1	5/23/2016 21:54
Bis(2-chloroisopropyl)ether	U		21	41	µg/Kg-dry	1	5/23/2016 21:54
Bis(2-ethylhexyl)phthalate	U		13	41	µg/Kg-dry	1	5/23/2016 21:54
Butyl benzyl phthalate	U		11	41	µg/Kg-dry	1	5/23/2016 21:54
Chrysene	U		6.9	8.2	µg/Kg-dry	1	5/23/2016 21:54
Dibenzo(a,h)anthracene	U		2.7	8.2	µg/Kg-dry	1	5/23/2016 21:54
Diethyl phthalate	U		5.2	41	µg/Kg-dry	1	5/23/2016 21:54
Dimethyl phthalate	U		4.1	41	µg/Kg-dry	1	5/23/2016 21:54
Di-n-butyl phthalate	**13**	J	**11**	**41**	**µg/Kg-dry**	1	5/23/2016 21:54
Di-n-octyl phthalate	U		11	41	µg/Kg-dry	1	5/23/2016 21:54
Fluoranthene	**8.6**		**5.0**	**8.2**	**µg/Kg-dry**	1	5/23/2016 21:54
Fluorene	**17**		**4.6**	**8.2**	**µg/Kg-dry**	1	5/23/2016 21:54
Hexachlorobenzene	U		6.6	41	µg/Kg-dry	1	5/23/2016 21:54
Hexachlorobutadiene	U		7.4	41	µg/Kg-dry	1	5/23/2016 21:54
Hexachlorocyclopentadiene	U		10	41	µg/Kg-dry	1	5/23/2016 21:54
Hexachloroethane	U		17	41	µg/Kg-dry	1	5/23/2016 21:54
Indeno(1,2,3-cd)pyrene	U		5.1	8.2	µg/Kg-dry	1	5/23/2016 21:54
Isophorone	U		7.3	200	µg/Kg-dry	1	5/23/2016 21:54
Naphthalene	**34**		**2.1**	**8.2**	**µg/Kg-dry**	1	5/23/2016 21:54
Nitrobenzene	U		8.9	200	µg/Kg-dry	1	5/23/2016 21:54
N-Nitrosodimethylamine	U		37	200	µg/Kg-dry	1	5/23/2016 21:54
N-Nitrosodi-n-propylamine	U		8.1	41	µg/Kg-dry	1	5/23/2016 21:54
N-Nitrosodiphenylamine	U		6.2	41	µg/Kg-dry	1	5/23/2016 21:54
Pentachlorophenol	U		14	41	µg/Kg-dry	1	5/23/2016 21:54
Phenanthrene	**47**		**4.5**	**8.2**	**µg/Kg-dry**	1	5/23/2016 21:54
Phenol	U		8.2	41	µg/Kg-dry	1	5/23/2016 21:54
Pyrene	**14**		**6.2**	**8.2**	**µg/Kg-dry**	1	5/23/2016 21:54
Surr: 2,4,6-Tribromophenol	*75.1*			*34-140*	*%REC*	1	5/23/2016 21:54
Surr: 2-Fluorobiphenyl	*62.1*			*12-100*	*%REC*	1	5/23/2016 21:54
Surr: 2-Fluorophenol	*68.3*			*33-117*	*%REC*	1	5/23/2016 21:54
Surr: 4-Terphenyl-d14	*99.5*			*25-137*	*%REC*	1	5/23/2016 21:54
Surr: Nitrobenzene-d5	*48.7*			*37-107*	*%REC*	1	5/23/2016 21:54
Surr: Phenol-d6	*64.0*			*40-106*	*%REC*	1	5/23/2016 21:54
VOLATILE ORGANICS - METHANOL CORRECTED		Method: **SW8260A**			Prep: SW5030A / 5/20/16		Analyst: **BG**
1,1,1-Trichloroethane	U		13	45	µg/Kg-dry	1	5/20/2016 15:57
1,1,2,2-Tetrachloroethane	U		11	45	µg/Kg-dry	1	5/20/2016 15:57
1,1,2-Trichloroethane	U		13	45	µg/Kg-dry	1	5/20/2016 15:57
1,1-Dichloroethane	U		11	45	µg/Kg-dry	1	5/20/2016 15:57

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-1
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		12	45	µg/Kg-dry	1	5/20/2016 15:57
1,2-Dichlorobenzene	U		13	45	µg/Kg-dry	1	5/20/2016 15:57
1,2-Dichloroethane	U		12	45	µg/Kg-dry	1	5/20/2016 15:57
1,2-Dichloropropane	U		12	45	µg/Kg-dry	1	5/20/2016 15:57
1,3-Dichlorobenzene	U		14	45	µg/Kg-dry	1	5/20/2016 15:57
1,4-Dichlorobenzene	U		12	45	µg/Kg-dry	1	5/20/2016 15:57
Acrolein	U		140	300	µg/Kg-dry	1	5/20/2016 15:57
Acrylonitrile	U		38	150	µg/Kg-dry	1	5/20/2016 15:57
Benzene	U		10	45	µg/Kg-dry	1	5/20/2016 15:57
Bromodichloromethane	U		12	45	µg/Kg-dry	1	5/20/2016 15:57
Bromoform	U		16	45	µg/Kg-dry	1	5/20/2016 15:57
Bromomethane	U		20	110	µg/Kg-dry	1	5/20/2016 15:57
Carbon tetrachloride	U		8.0	45	µg/Kg-dry	1	5/20/2016 15:57
Chlorobenzene	U		14	45	µg/Kg-dry	1	5/20/2016 15:57
Chloroethane	U		29	150	µg/Kg-dry	1	5/20/2016 15:57
Chloroform	U		15	45	µg/Kg-dry	1	5/20/2016 15:57
Chloromethane	U		18	150	µg/Kg-dry	1	5/20/2016 15:57
cis-1,2-Dichloroethene	U		13	45	µg/Kg-dry	1	5/20/2016 15:57
cis-1,3-Dichloropropene	U		17	45	µg/Kg-dry	1	5/20/2016 15:57
Dibromochloromethane	U		10	45	µg/Kg-dry	1	5/20/2016 15:57
Ethylbenzene	U		10	45	µg/Kg-dry	1	5/20/2016 15:57
Methylene chloride	U		21	45	µg/Kg-dry	1	5/20/2016 15:57
Tetrachloroethene	U		22	45	µg/Kg-dry	1	5/20/2016 15:57
Toluene	**22**	J	**15**	**45**	**µg/Kg-dry**	1	5/20/2016 15:57
trans-1,2-Dichloroethene	U		13	45	µg/Kg-dry	1	5/20/2016 15:57
trans-1,3-Dichloropropene	U		8.0	45	µg/Kg-dry	1	5/20/2016 15:57
Trichloroethene	U		12	45	µg/Kg-dry	1	5/20/2016 15:57
Vinyl chloride	U		14	45	µg/Kg-dry	1	5/20/2016 15:57
Surr: 1,2-Dichloroethane-d4	*99.8*			*70-120*	*%REC*	1	5/20/2016 15:57
Surr: 4-Bromofluorobenzene	*96.4*			*75-120*	*%REC*	1	5/20/2016 15:57
Surr: Dibromofluoromethane	*99.8*			*85-115*	*%REC*	1	5/20/2016 15:57
Surr: Toluene-d8	*96.8*			*85-120*	*%REC*	1	5/20/2016 15:57
BIOCHEMICAL OXYGEN DEMAND			Method: **A5210B-97**		Prep: A5210B / 5/19/16		Analyst: **JRF**
Biochemical Oxygen Demand	*<32.43*		12	12	mg/Kg-dry	1	5/24/2016 10:30
CHLORIDE			Method: **A4500-CL E-97**		Prep: EXTRACT / 5/18/16		Analyst: **ED**
Chloride	**15**		**1.3**	**12**	**mg/Kg-dry**	1	5/23/2016 20:30
CYANIDE, TOTAL			Method: **SW9012B**		Prep: SW9012B / 5/20/16		Analyst: **JB**
Cyanide, Total	**0.040**	J	**0.014**	**0.62**	**mg/Kg-dry**	1	5/25/2016 10:14

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-1
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND			Method: **E410.4 R2.0**		Prep: EXTRACT / 5/18/16		Analyst: **JJG**
Chemical Oxygen Demand	**260**	J	**110**	**620**	**mg/Kg-dry**	1	5/18/2016 12:25
MOISTURE			Method: **SW3550C**				Analyst: **EDL**
Moisture	**20**		**0.025**	**0.050**	**% of sample**	1	5/19/2016 16:14
NITROGEN, TOTAL			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total	**610**		**0**	**1.2**	**mg/Kg-dry**	1	5/24/2016 15:40
AMMONIA AS NITROGEN			Method: **A4500-NH3 G-97**		Prep: A4500-NH3 B / 5/23/16		Analyst: **JJG**
Ammonia as Nitrogen	**7.7**	J	**3.8**	**13**	**mg NH3-N/Kg-dry**	1	5/23/2016 14:37
NITROGEN, NITRITE			Method: **A4500-NO2 B**		Prep: EXTRACT / 5/20/16		Analyst: **LW**
Nitrogen, Nitrite	**0.036**	J	**0.0099**	**0.87**	**mg/Kg-dry**	1	5/20/2016 15:15
NITROGEN, NITRATE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate	**0.89**	J	**0.061**	**1.2**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, NITRATE-NITRITE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**0.92**	J	**0.095**	**1.2**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, TOTAL INORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Inorganic	**8.6**		**0**	**0.025**	**mg/Kg-dry**	1	5/24/2016 15:50
NITROGEN, TOTAL ORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Organic	**600**		**1.2**	**1.2**	**mg/Kg-dry**	1	5/24/2016 15:40
PHOSPHORUS, TOTAL			Method: **E365.1 R2.0**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Total	**310**		**44**	**180**	**mg/Kg-dry**	30	5/20/2016 10:47
PH			Method: **SW9045D**		Prep: EXTRACT / 5/18/16		Analyst: **JB**
pH	**8.2**		**0**		**s.u.**	1	5/18/2016 13:30
PHOSPHORUS, ORTHO-P (AS P)			Method: **A4500-P E-97**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**1.6**		**0.58**	**1.2**	**mg/Kg-dry**	1	5/20/2016 13:29
NITROGEN, TOTAL KJELDAHL			Method: **A4500-NH3 G-97**		Prep: A4500-N B / 5/23/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**610**		**28**	**60**	**mg/Kg-dry**	10	5/24/2016 13:58
ORGANIC CARBON - WALKLEY-BLACK			Method: **TITRAMETRIC**				Analyst: **KF**
Organic Carbon - W-B	**0.77**		**0.015**	**0.031**	**% by wt-dry**	1	5/23/2016 12:10

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-1
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 5/19/16		Analyst: **EB**
Aroclor 1016	U		15	130	µg/Kg-dry	1	5/21/2016 16:08
Aroclor 1221	U		15	130	µg/Kg-dry	1	5/21/2016 16:08
Aroclor 1232	U		15	130	µg/Kg-dry	1	5/21/2016 16:08
Aroclor 1242	U		15	130	µg/Kg-dry	1	5/21/2016 16:08
Aroclor 1248	U		15	130	µg/Kg-dry	1	5/21/2016 16:08
Aroclor 1254	U		19	130	µg/Kg-dry	1	5/21/2016 16:08
Aroclor 1260	U		19	130	µg/Kg-dry	1	5/21/2016 16:08
Surr: Decachlorobiphenyl	*84.1*			*40-140*	*%REC*	1	5/21/2016 16:08
Surr: Tetrachloro-m-xylene	*69.1*			*45-124*	*%REC*	1	5/21/2016 16:08
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 5/19/16		Analyst: **BLM**
4,4´-DDD	U		4.1	31	µg/Kg-dry	2	5/20/2016 17:13
4,4´-DDE	U		6.4	31	µg/Kg-dry	2	5/20/2016 17:13
4,4´-DDT	U		5.5	31	µg/Kg-dry	2	5/20/2016 17:13
Aldrin	U		4.8	31	µg/Kg-dry	2	5/20/2016 17:13
alpha-BHC	U		3.2	31	µg/Kg-dry	2	5/20/2016 17:13
alpha-Chlordane	U		5.2	31	µg/Kg-dry	2	5/20/2016 17:13
beta-BHC	U		11	31	µg/Kg-dry	2	5/20/2016 17:13
Chlordane, Technical	U		22	77	µg/Kg-dry	2	5/20/2016 17:13
delta-BHC	U		4.8	31	µg/Kg-dry	2	5/20/2016 17:13
Dieldrin	U		6.4	31	µg/Kg-dry	2	5/20/2016 17:13
Endosulfan I	U		4.0	31	µg/Kg-dry	2	5/20/2016 17:13
Endosulfan II	U		6.9	31	µg/Kg-dry	2	5/20/2016 17:13
Endosulfan sulfate	U		5.5	31	µg/Kg-dry	2	5/20/2016 17:13
Endrin	U		5.2	31	µg/Kg-dry	2	5/20/2016 17:13
Endrin aldehyde	U		12	31	µg/Kg-dry	2	5/20/2016 17:13
gamma-BHC (Lindane)	U		4.3	31	µg/Kg-dry	2	5/20/2016 17:13
Heptachlor	U		4.8	31	µg/Kg-dry	2	5/20/2016 17:13
Heptachlor epoxide	U		4.3	31	µg/Kg-dry	2	5/20/2016 17:13
Toxaphene	U		23	180	µg/Kg-dry	2	5/20/2016 17:13
Surr: Decachlorobiphenyl	*72.1*			*45-135*	*%REC*	2	5/20/2016 17:13
Surr: Tetrachloro-m-xylene	*66.1*			*45-124*	*%REC*	2	5/20/2016 17:13
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 5/20/16		Analyst: **LR**
Mercury	**0.028**		**0.0034**	**0.021**	**mg/Kg-dry**	1	5/23/2016 22:37
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Magnesium	**19,000**		**5.1**	**220**	**mg/Kg-dry**	10	5/21/2016 23:11
Potassium	**1,400**		**8.3**	**220**	**mg/Kg-dry**	10	5/21/2016 23:11
Sodium	**180**	J	**44**	**220**	**mg/Kg-dry**	10	5/21/2016 23:11

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-1
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Antimony	**0.20**	J	**0.065**	**5.5**	**mg/Kg-dry**	10	5/21/2016 04:05
Arsenic	**6.2**		**0.85**	**5.5**	**mg/Kg-dry**	10	5/21/2016 04:05
Beryllium	**0.44**	J	**0.087**	**2.2**	**mg/Kg-dry**	10	5/21/2016 04:05
Cadmium	**0.21**	J	**0.087**	**2.2**	**mg/Kg-dry**	10	5/21/2016 04:05
Chromium	**15**		**0.87**	**5.5**	**mg/Kg-dry**	10	5/21/2016 04:05
Copper	**17**		**0.28**	**5.5**	**mg/Kg-dry**	10	5/21/2016 04:05
Lead	**9.2**		**0.13**	**5.5**	**mg/Kg-dry**	10	5/21/2016 04:05
Nickel	**24**		**0.94**	**5.5**	**mg/Kg-dry**	10	5/21/2016 04:05
Selenium	**1.7**	J	**0.85**	**5.5**	**mg/Kg-dry**	10	5/21/2016 04:05
Silver	U		0.15	5.5	mg/Kg-dry	10	5/21/2016 04:05
Thallium	**0.26**	J	**0.15**	**5.5**	**mg/Kg-dry**	10	5/21/2016 04:05
Zinc	**58**		**2.2**	**11**	**mg/Kg-dry**	10	5/21/2016 04:05
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 5/23/16		Analyst: **RS**
1,2-Diphenylhydrazine	U		8.6	100	µg/Kg-dry	1	5/23/2016 22:18
2,4,6-Trichlorophenol	U		20	100	µg/Kg-dry	1	5/23/2016 22:18
2,4-Dichlorophenol	U		21	100	µg/Kg-dry	1	5/23/2016 22:18
2,4-Dimethylphenol	U		24	100	µg/Kg-dry	1	5/23/2016 22:18
2,4-Dinitrophenol	U		31	100	µg/Kg-dry	1	5/23/2016 22:18
2,4-Dinitrotoluene	U		15	100	µg/Kg-dry	1	5/23/2016 22:18
2,6-Dinitrotoluene	U		22	100	µg/Kg-dry	1	5/23/2016 22:18
2-Chloronaphthalene	U		5.6	21	µg/Kg-dry	1	5/23/2016 22:18
2-Chlorophenol	U		18	100	µg/Kg-dry	1	5/23/2016 22:18
2-Nitrophenol	U		27	100	µg/Kg-dry	1	5/23/2016 22:18
3,3´-Dichlorobenzidine	U		130	520	µg/Kg-dry	1	5/23/2016 22:18
4,6-Dinitro-2-methylphenol	U		15	100	µg/Kg-dry	1	5/23/2016 22:18
4-Bromophenyl phenyl ether	U		15	100	µg/Kg-dry	1	5/23/2016 22:18
4-Chloro-3-methylphenol	U		15	100	µg/Kg-dry	1	5/23/2016 22:18
4-Chlorophenyl phenyl ether	U		18	100	µg/Kg-dry	1	5/23/2016 22:18
4-Nitrophenol	U		16	100	µg/Kg-dry	1	5/23/2016 22:18
Acenaphthene	U		7.7	21	µg/Kg-dry	1	5/23/2016 22:18
Acenaphthylene	U		6.3	21	µg/Kg-dry	1	5/23/2016 22:18
Anthracene	U		10	21	µg/Kg-dry	1	5/23/2016 22:18
Benzidine	U		110	520	µg/Kg-dry	1	5/23/2016 22:18
Benzo(a)anthracene	U		12	21	µg/Kg-dry	1	5/23/2016 22:18
Benzo(a)pyrene	U		4.4	21	µg/Kg-dry	1	5/23/2016 22:18
Benzo(b)fluoranthene	U		7.0	21	µg/Kg-dry	1	5/23/2016 22:18
Benzo(g,h,i)perylene	U		9.0	21	µg/Kg-dry	1	5/23/2016 22:18
Benzo(k)fluoranthene	U		13	21	µg/Kg-dry	1	5/23/2016 22:18

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-1
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		10	100	µg/Kg-dry	1	5/23/2016 22:18
Bis(2-chloroethyl)ether	U		11	100	µg/Kg-dry	1	5/23/2016 22:18
Bis(2-chloroisopropyl)ether	U		52	100	µg/Kg-dry	1	5/23/2016 22:18
Bis(2-ethylhexyl)phthalate	U		32	100	µg/Kg-dry	1	5/23/2016 22:18
Butyl benzyl phthalate	U		29	100	µg/Kg-dry	1	5/23/2016 22:18
Chrysene	U		17	21	µg/Kg-dry	1	5/23/2016 22:18
Dibenzo(a,h)anthracene	U		6.7	21	µg/Kg-dry	1	5/23/2016 22:18
Diethyl phthalate	**56**	J	**13**	**100**	**µg/Kg-dry**	1	5/23/2016 22:18
Dimethyl phthalate	U		10	100	µg/Kg-dry	1	5/23/2016 22:18
Di-n-butyl phthalate	U		28	100	µg/Kg-dry	1	5/23/2016 22:18
Di-n-octyl phthalate	U		27	100	µg/Kg-dry	1	5/23/2016 22:18
Fluoranthene	**17**	J	**13**	**21**	**µg/Kg-dry**	1	5/23/2016 22:18
Fluorene	U		11	21	µg/Kg-dry	1	5/23/2016 22:18
Hexachlorobenzene	U		17	100	µg/Kg-dry	1	5/23/2016 22:18
Hexachlorobutadiene	U		19	100	µg/Kg-dry	1	5/23/2016 22:18
Hexachlorocyclopentadiene	U		25	100	µg/Kg-dry	1	5/23/2016 22:18
Hexachloroethane	U		44	100	µg/Kg-dry	1	5/23/2016 22:18
Indeno(1,2,3-cd)pyrene	U		13	21	µg/Kg-dry	1	5/23/2016 22:18
Isophorone	U		18	520	µg/Kg-dry	1	5/23/2016 22:18
Naphthalene	**43**		**5.3**	**21**	**µg/Kg-dry**	1	5/23/2016 22:18
Nitrobenzene	U		23	520	µg/Kg-dry	1	5/23/2016 22:18
N-Nitrosodimethylamine	U		93	520	µg/Kg-dry	1	5/23/2016 22:18
N-Nitrosodi-n-propylamine	U		20	100	µg/Kg-dry	1	5/23/2016 22:18
N-Nitrosodiphenylamine	U		16	100	µg/Kg-dry	1	5/23/2016 22:18
Pentachlorophenol	U		35	100	µg/Kg-dry	1	5/23/2016 22:18
Phenanthrene	**36**		**11**	**21**	**µg/Kg-dry**	1	5/23/2016 22:18
Phenol	U		21	100	µg/Kg-dry	1	5/23/2016 22:18
Pyrene	**22**		**16**	**21**	**µg/Kg-dry**	1	5/23/2016 22:18
Surr: 2,4,6-Tribromophenol	*80.0*			*34-140*	*%REC*	1	5/23/2016 22:18
Surr: 2-Fluorobiphenyl	*74.9*			*12-100*	*%REC*	1	5/23/2016 22:18
Surr: 2-Fluorophenol	*91.2*			*33-117*	*%REC*	1	5/23/2016 22:18
Surr: 4-Terphenyl-d14	*99.0*			*25-137*	*%REC*	1	5/23/2016 22:18
Surr: Nitrobenzene-d5	*71.9*			*37-107*	*%REC*	1	5/23/2016 22:18
Surr: Phenol-d6	*78.5*			*40-106*	*%REC*	1	5/23/2016 22:18
VOLATILE ORGANICS - METHANOL CORRECTED		Method: **SW8260A**			Prep: SW5030A / 5/20/16		Analyst: **BG**
1,1,1-Trichloroethane	U		19	65	µg/Kg-dry	1	5/20/2016 16:24
1,1,2,2-Tetrachloroethane	U		16	65	µg/Kg-dry	1	5/20/2016 16:24
1,1,2-Trichloroethane	U		20	65	µg/Kg-dry	1	5/20/2016 16:24
1,1-Dichloroethane	U		17	65	µg/Kg-dry	1	5/20/2016 16:24

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-1
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		18	65	µg/Kg-dry	1	5/20/2016 16:24
1,2-Dichlorobenzene	U		19	65	µg/Kg-dry	1	5/20/2016 16:24
1,2-Dichloroethane	U		18	65	µg/Kg-dry	1	5/20/2016 16:24
1,2-Dichloropropane	U		18	65	µg/Kg-dry	1	5/20/2016 16:24
1,3-Dichlorobenzene	U		21	65	µg/Kg-dry	1	5/20/2016 16:24
1,4-Dichlorobenzene	U		17	65	µg/Kg-dry	1	5/20/2016 16:24
Acrolein	U		200	430	µg/Kg-dry	1	5/20/2016 16:24
Acrylonitrile	U		55	220	µg/Kg-dry	1	5/20/2016 16:24
Benzene	U		15	65	µg/Kg-dry	1	5/20/2016 16:24
Bromodichloromethane	U		17	65	µg/Kg-dry	1	5/20/2016 16:24
Bromoform	U		23	65	µg/Kg-dry	1	5/20/2016 16:24
Bromomethane	U		28	160	µg/Kg-dry	1	5/20/2016 16:24
Carbon tetrachloride	U		12	65	µg/Kg-dry	1	5/20/2016 16:24
Chlorobenzene	U		20	65	µg/Kg-dry	1	5/20/2016 16:24
Chloroethane	U		42	220	µg/Kg-dry	1	5/20/2016 16:24
Chloroform	U		22	65	µg/Kg-dry	1	5/20/2016 16:24
Chloromethane	U		26	220	µg/Kg-dry	1	5/20/2016 16:24
cis-1,2-Dichloroethene	U		18	65	µg/Kg-dry	1	5/20/2016 16:24
cis-1,3-Dichloropropene	U		25	65	µg/Kg-dry	1	5/20/2016 16:24
Dibromochloromethane	U		15	65	µg/Kg-dry	1	5/20/2016 16:24
Ethylbenzene	U		15	65	µg/Kg-dry	1	5/20/2016 16:24
Methylene chloride	U		30	65	µg/Kg-dry	1	5/20/2016 16:24
Tetrachloroethene	U		32	65	µg/Kg-dry	1	5/20/2016 16:24
Toluene	U		22	65	µg/Kg-dry	1	5/20/2016 16:24
trans-1,2-Dichloroethene	U		18	65	µg/Kg-dry	1	5/20/2016 16:24
trans-1,3-Dichloropropene	U		12	65	µg/Kg-dry	1	5/20/2016 16:24
Trichloroethene	U		17	65	µg/Kg-dry	1	5/20/2016 16:24
Vinyl chloride	U		21	65	µg/Kg-dry	1	5/20/2016 16:24
Surr: 1,2-Dichloroethane-d4	*98.6*			*70-120*	*%REC*	1	5/20/2016 16:24
Surr: 4-Bromofluorobenzene	*96.4*			*75-120*	*%REC*	1	5/20/2016 16:24
Surr: Dibromofluoromethane	*98.2*			*85-115*	*%REC*	1	5/20/2016 16:24
Surr: Toluene-d8	*97.0*			*85-120*	*%REC*	1	5/20/2016 16:24
BIOCHEMICAL OXYGEN DEMAND			Method: **A5210B-97**		Prep: A5210B / 5/19/16		Analyst: **JRF**
Biochemical Oxygen Demand	*<32.27*		16	16	mg/Kg-dry	1	5/24/2016 10:30
CHLORIDE			Method: **A4500-CL E-97**		Prep: EXTRACT / 5/18/16		Analyst: **ED**
Chloride	**35**		**1.7**	**16**	**mg/Kg-dry**	1	5/23/2016 20:30
CYANIDE, TOTAL			Method: **SW9012B**		Prep: SW9012B / 5/20/16		Analyst: **JB**
Cyanide, Total	**0.11**	J	**0.017**	**0.79**	**mg/Kg-dry**	1	5/25/2016 10:14

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-1
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND		Method: **E410.4 R2.0**			Prep: EXTRACT / 5/18/16		Analyst: **JJG**
Chemical Oxygen Demand	**370**	J	**140**	**790**	**mg/Kg-dry**	1	5/18/2016 12:25
MOISTURE		Method: **SW3550C**					Analyst: **EDL**
Moisture	**37**		**0.025**	**0.050**	**% of sample**	1	5/18/2016 16:29
NITROGEN, TOTAL		Method: **CALCULATION**					Analyst: **JB**
Nitrogen, Total	**800**		**0**	**1.6**	**mg/Kg-dry**	1	5/24/2016 15:40
AMMONIA AS NITROGEN		Method: **A4500-NH3 G-97**			Prep: A4500-NH3 B / 5/23/16		Analyst: **JJG**
Ammonia as Nitrogen	**9.8**	J	**5.2**	**17**	**mg NH3-N/Kg-dry**	1	5/23/2016 14:37
NITROGEN, NITRITE		Method: **A4500-NO2 B**			Prep: EXTRACT / 5/20/16		Analyst: **LW**
Nitrogen, Nitrite	U		0.013	1.1	mg/Kg-dry	1	5/20/2016 15:15
NITROGEN, NITRATE		Method: **E353.2**			Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate	**1.1**	J	**0.077**	**1.6**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, NITRATE-NITRITE		Method: **E353.2**			Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**1.2**	J	**0.12**	**1.6**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, TOTAL INORGANIC		Method: **CALCULATION**					Analyst: **JB**
Nitrogen, Total Inorganic	**11**		**0**	**0.032**	**mg/Kg-dry**	1	5/24/2016 15:50
NITROGEN, TOTAL ORGANIC		Method: **CALCULATION**					Analyst: **JB**
Nitrogen, Total Organic	**790**		**1.6**	**1.6**	**mg/Kg-dry**	1	5/24/2016 15:40
PHOSPHORUS, TOTAL		Method: **E365.1 R2.0**			Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Total	**280**		**57**	**240**	**mg/Kg-dry**	30	5/20/2016 10:47
PH		Method: **SW9045D**			Prep: EXTRACT / 5/18/16		Analyst: **JB**
pH	**9.6**		**0**		**s.u.**	1	5/18/2016 13:30
PHOSPHORUS, ORTHO-P (AS P)		Method: **A4500-P E-97**			Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**1.6**		**0.75**	**1.6**	**mg/Kg-dry**	1	5/20/2016 13:29
NITROGEN, TOTAL KJELDAHL		Method: **A4500-NH3 G-97**			Prep: A4500-N B / 5/23/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**790**		**37**	**80**	**mg/Kg-dry**	10	5/24/2016 13:58
ORGANIC CARBON - WALKLEY-BLACK		Method: **TITRAMETRIC**					Analyst: **KF**
Organic Carbon - W-B	**1.1**		**0.019**	**0.040**	**% by wt-dry**	1	5/23/2016 12:10

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-2
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-04
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 5/19/16		Analyst: **EB**
Aroclor 1016	U		14	120	µg/Kg-dry	1	5/21/2016 16:25
Aroclor 1221	U		14	120	µg/Kg-dry	1	5/21/2016 16:25
Aroclor 1232	U		14	120	µg/Kg-dry	1	5/21/2016 16:25
Aroclor 1242	U		14	120	µg/Kg-dry	1	5/21/2016 16:25
Aroclor 1248	U		14	120	µg/Kg-dry	1	5/21/2016 16:25
Aroclor 1254	U		17	120	µg/Kg-dry	1	5/21/2016 16:25
Aroclor 1260	U		17	120	µg/Kg-dry	1	5/21/2016 16:25
Surr: Decachlorobiphenyl	*83.1*			*40-140*	*%REC*	1	5/21/2016 16:25
Surr: Tetrachloro-m-xylene	*71.1*			*45-124*	*%REC*	1	5/21/2016 16:25
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 5/19/16		Analyst: **BLM**
4,4´-DDD	U		3.7	28	µg/Kg-dry	2	5/20/2016 17:29
4,4´-DDE	U		5.8	28	µg/Kg-dry	2	5/20/2016 17:29
4,4´-DDT	U		5.0	28	µg/Kg-dry	2	5/20/2016 17:29
Aldrin	U		4.3	28	µg/Kg-dry	2	5/20/2016 17:29
alpha-BHC	U		2.9	28	µg/Kg-dry	2	5/20/2016 17:29
alpha-Chlordane	U		4.7	28	µg/Kg-dry	2	5/20/2016 17:29
beta-BHC	U		9.8	28	µg/Kg-dry	2	5/20/2016 17:29
Chlordane, Technical	U		20	69	µg/Kg-dry	2	5/20/2016 17:29
delta-BHC	U		4.3	28	µg/Kg-dry	2	5/20/2016 17:29
Dieldrin	U		5.8	28	µg/Kg-dry	2	5/20/2016 17:29
Endosulfan I	U		3.6	28	µg/Kg-dry	2	5/20/2016 17:29
Endosulfan II	U		6.2	28	µg/Kg-dry	2	5/20/2016 17:29
Endosulfan sulfate	U		4.9	28	µg/Kg-dry	2	5/20/2016 17:29
Endrin	U		4.7	28	µg/Kg-dry	2	5/20/2016 17:29
Endrin aldehyde	U		11	28	µg/Kg-dry	2	5/20/2016 17:29
gamma-BHC (Lindane)	U		3.9	28	µg/Kg-dry	2	5/20/2016 17:29
Heptachlor	U		4.3	28	µg/Kg-dry	2	5/20/2016 17:29
Heptachlor epoxide	U		3.9	28	µg/Kg-dry	2	5/20/2016 17:29
Toxaphene	U		20	170	µg/Kg-dry	2	5/20/2016 17:29
Surr: Decachlorobiphenyl	*68.1*			*45-135*	*%REC*	2	5/20/2016 17:29
Surr: Tetrachloro-m-xylene	*68.1*			*45-124*	*%REC*	2	5/20/2016 17:29
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 5/20/16		Analyst: **LR**
Mercury	**0.025**		**0.0037**	**0.023**	**mg/Kg-dry**	1	5/23/2016 22:40
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Magnesium	**16,000**		**5.4**	**230**	**mg/Kg-dry**	10	5/21/2016 23:17
Potassium	**1,800**		**8.7**	**230**	**mg/Kg-dry**	10	5/21/2016 23:17
Sodium	**150**	J	**47**	**230**	**mg/Kg-dry**	10	5/21/2016 23:17

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-2
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-04
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Antimony	**0.29**	J	**0.069**	**5.8**	**mg/Kg-dry**	10	5/21/2016 04:11
Arsenic	**8.0**		**0.90**	**5.8**	**mg/Kg-dry**	10	5/21/2016 04:11
Beryllium	**0.53**	J	**0.092**	**2.3**	**mg/Kg-dry**	10	5/21/2016 04:11
Cadmium	**0.26**	J	**0.092**	**2.3**	**mg/Kg-dry**	10	5/21/2016 04:11
Chromium	**17**		**0.92**	**5.8**	**mg/Kg-dry**	10	5/21/2016 04:11
Copper	**21**		**0.30**	**5.8**	**mg/Kg-dry**	10	5/21/2016 04:11
Lead	**10**		**0.14**	**5.8**	**mg/Kg-dry**	10	5/21/2016 04:11
Nickel	**27**		**0.99**	**5.8**	**mg/Kg-dry**	10	5/21/2016 04:11
Selenium	**1.5**	J	**0.90**	**5.8**	**mg/Kg-dry**	10	5/21/2016 04:11
Silver	U		0.16	5.8	mg/Kg-dry	10	5/21/2016 04:11
Thallium	**0.33**	J	**0.16**	**5.8**	**mg/Kg-dry**	10	5/21/2016 04:11
Zinc	**63**		**2.3**	**12**	**mg/Kg-dry**	10	5/21/2016 04:11
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 5/23/16		Analyst: **RS**
1,2-Diphenylhydrazine	U		6.0	72	µg/Kg-dry	1	5/24/2016 21:31
2,4,6-Trichlorophenol	U		14	72	µg/Kg-dry	1	5/24/2016 21:31
2,4-Dichlorophenol	U		15	72	µg/Kg-dry	1	5/24/2016 21:31
2,4-Dimethylphenol	U		17	72	µg/Kg-dry	1	5/24/2016 21:31
2,4-Dinitrophenol	U		22	72	µg/Kg-dry	1	5/24/2016 21:31
2,4-Dinitrotoluene	U		11	72	µg/Kg-dry	1	5/24/2016 21:31
2,6-Dinitrotoluene	U		15	72	µg/Kg-dry	1	5/24/2016 21:31
2-Chloronaphthalene	U		3.9	14	µg/Kg-dry	1	5/24/2016 21:31
2-Chlorophenol	U		13	72	µg/Kg-dry	1	5/24/2016 21:31
2-Nitrophenol	U		19	72	µg/Kg-dry	1	5/24/2016 21:31
3,3´-Dichlorobenzidine	U		91	360	µg/Kg-dry	1	5/24/2016 21:31
4,6-Dinitro-2-methylphenol	U		10	72	µg/Kg-dry	1	5/24/2016 21:31
4-Bromophenyl phenyl ether	U		11	72	µg/Kg-dry	1	5/24/2016 21:31
4-Chloro-3-methylphenol	U		11	72	µg/Kg-dry	1	5/24/2016 21:31
4-Chlorophenyl phenyl ether	U		13	72	µg/Kg-dry	1	5/24/2016 21:31
4-Nitrophenol	U		11	72	µg/Kg-dry	1	5/24/2016 21:31
Acenaphthene	U		5.4	14	µg/Kg-dry	1	5/24/2016 21:31
Acenaphthylene	U		4.5	14	µg/Kg-dry	1	5/24/2016 21:31
Anthracene	U		7.0	14	µg/Kg-dry	1	5/24/2016 21:31
Benzidine	U		75	360	µg/Kg-dry	1	5/24/2016 21:31
Benzo(a)anthracene	U		8.8	14	µg/Kg-dry	1	5/24/2016 21:31
Benzo(a)pyrene	U		3.1	14	µg/Kg-dry	1	5/24/2016 21:31
Benzo(b)fluoranthene	U		4.9	14	µg/Kg-dry	1	5/24/2016 21:31
Benzo(g,h,i)perylene	U		6.3	14	µg/Kg-dry	1	5/24/2016 21:31
Benzo(k)fluoranthene	U		9.1	14	µg/Kg-dry	1	5/24/2016 21:31

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-2
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-04
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		7.3	72	µg/Kg-dry	1	5/24/2016 21:31
Bis(2-chloroethyl)ether	U		8.0	72	µg/Kg-dry	1	5/24/2016 21:31
Bis(2-chloroisopropyl)ether	U		37	72	µg/Kg-dry	1	5/24/2016 21:31
Bis(2-ethylhexyl)phthalate	U		23	72	µg/Kg-dry	1	5/24/2016 21:31
Butyl benzyl phthalate	U		20	72	µg/Kg-dry	1	5/24/2016 21:31
Chrysene	U		12	14	µg/Kg-dry	1	5/24/2016 21:31
Dibenzo(a,h)anthracene	U		4.7	14	µg/Kg-dry	1	5/24/2016 21:31
Diethyl phthalate	U		9.2	72	µg/Kg-dry	1	5/24/2016 21:31
Dimethyl phthalate	**27**	J	**7.2**	**72**	**µg/Kg-dry**	1	5/24/2016 21:31
Di-n-butyl phthalate	U		20	72	µg/Kg-dry	1	5/24/2016 21:31
Di-n-octyl phthalate	U		19	72	µg/Kg-dry	1	5/24/2016 21:31
Fluoranthene	**18**		**8.9**	**14**	**µg/Kg-dry**	1	5/24/2016 21:31
Fluorene	U		8.1	14	µg/Kg-dry	1	5/24/2016 21:31
Hexachlorobenzene	U		12	72	µg/Kg-dry	1	5/24/2016 21:31
Hexachlorobutadiene	U		13	72	µg/Kg-dry	1	5/24/2016 21:31
Hexachlorocyclopentadiene	U		18	72	µg/Kg-dry	1	5/24/2016 21:31
Hexachloroethane	U		31	72	µg/Kg-dry	1	5/24/2016 21:31
Indeno(1,2,3-cd)pyrene	U		9.0	14	µg/Kg-dry	1	5/24/2016 21:31
Isophorone	U		13	360	µg/Kg-dry	1	5/24/2016 21:31
Naphthalene	U		3.8	14	µg/Kg-dry	1	5/24/2016 21:31
Nitrobenzene	U		16	360	µg/Kg-dry	1	5/24/2016 21:31
N-Nitrosodimethylamine	U		65	360	µg/Kg-dry	1	5/24/2016 21:31
N-Nitrosodi-n-propylamine	U		14	72	µg/Kg-dry	1	5/24/2016 21:31
N-Nitrosodiphenylamine	U		11	72	µg/Kg-dry	1	5/24/2016 21:31
Pentachlorophenol	U		25	72	µg/Kg-dry	1	5/24/2016 21:31
Phenanthrene	**44**		**8.0**	**14**	**µg/Kg-dry**	1	5/24/2016 21:31
Phenol	U		14	72	µg/Kg-dry	1	5/24/2016 21:31
Pyrene	**18**		**11**	**14**	**µg/Kg-dry**	1	5/24/2016 21:31
Surr: 2,4,6-Tribromophenol	*82.5*			*34-140*	*%REC*	1	5/24/2016 21:31
Surr: 2-Fluorobiphenyl	*67.4*			*12-100*	*%REC*	1	5/24/2016 21:31
Surr: 2-Fluorophenol	*95.8*			*33-117*	*%REC*	1	5/24/2016 21:31
Surr: 4-Terphenyl-d14	*103*			*25-137*	*%REC*	1	5/24/2016 21:31
Surr: Nitrobenzene-d5	*68.7*			*37-107*	*%REC*	1	5/24/2016 21:31
Surr: Phenol-d6	*90.3*			*40-106*	*%REC*	1	5/24/2016 21:31
VOLATILE ORGANICS - METHANOL CORRECTED		Method: **SW8260A**			Prep: SW5030A / 5/20/16		Analyst: **BG**
1,1,1-Trichloroethane	U		16	57	µg/Kg-dry	1	5/20/2016 17:16
1,1,2,2-Tetrachloroethane	U		14	57	µg/Kg-dry	1	5/20/2016 17:16
1,1,2-Trichloroethane	U		17	57	µg/Kg-dry	1	5/20/2016 17:16
1,1-Dichloroethane	U		14	57	µg/Kg-dry	1	5/20/2016 17:16

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-2
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-04
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		15	57	µg/Kg-dry	1	5/20/2016 17:16
1,2-Dichlorobenzene	U		17	57	µg/Kg-dry	1	5/20/2016 17:16
1,2-Dichloroethane	U		15	57	µg/Kg-dry	1	5/20/2016 17:16
1,2-Dichloropropane	U		16	57	µg/Kg-dry	1	5/20/2016 17:16
1,3-Dichlorobenzene	U		18	57	µg/Kg-dry	1	5/20/2016 17:16
1,4-Dichlorobenzene	U		15	57	µg/Kg-dry	1	5/20/2016 17:16
Acrolein	U		170	380	µg/Kg-dry	1	5/20/2016 17:16
Acrylonitrile	U		48	190	µg/Kg-dry	1	5/20/2016 17:16
Benzene	U		13	57	µg/Kg-dry	1	5/20/2016 17:16
Bromodichloromethane	U		15	57	µg/Kg-dry	1	5/20/2016 17:16
Bromoform	U		20	57	µg/Kg-dry	1	5/20/2016 17:16
Bromomethane	U		25	140	µg/Kg-dry	1	5/20/2016 17:16
Carbon tetrachloride	U		10	57	µg/Kg-dry	1	5/20/2016 17:16
Chlorobenzene	U		17	57	µg/Kg-dry	1	5/20/2016 17:16
Chloroethane	U		36	190	µg/Kg-dry	1	5/20/2016 17:16
Chloroform	U		19	57	µg/Kg-dry	1	5/20/2016 17:16
Chloromethane	U		23	190	µg/Kg-dry	1	5/20/2016 17:16
cis-1,2-Dichloroethene	U		16	57	µg/Kg-dry	1	5/20/2016 17:16
cis-1,3-Dichloropropene	U		22	57	µg/Kg-dry	1	5/20/2016 17:16
Dibromochloromethane	U		13	57	µg/Kg-dry	1	5/20/2016 17:16
Ethylbenzene	U		13	57	µg/Kg-dry	1	5/20/2016 17:16
Methylene chloride	U		26	57	µg/Kg-dry	1	5/20/2016 17:16
Tetrachloroethene	U		28	57	µg/Kg-dry	1	5/20/2016 17:16
Toluene	**24**	J	**19**	**57**	**µg/Kg-dry**	1	5/20/2016 17:16
trans-1,2-Dichloroethene	U		16	57	µg/Kg-dry	1	5/20/2016 17:16
trans-1,3-Dichloropropene	U		10	57	µg/Kg-dry	1	5/20/2016 17:16
Trichloroethene	U		15	57	µg/Kg-dry	1	5/20/2016 17:16
Vinyl chloride	U		18	57	µg/Kg-dry	1	5/20/2016 17:16
Surr: 1,2-Dichloroethane-d4	*101*			*70-120*	*%REC*	1	5/20/2016 17:16
Surr: 4-Bromofluorobenzene	*97.2*			*75-120*	*%REC*	1	5/20/2016 17:16
Surr: Dibromofluoromethane	*101*			*85-115*	*%REC*	1	5/20/2016 17:16
Surr: Toluene-d8	*98.2*			*85-120*	*%REC*	1	5/20/2016 17:16
BIOCHEMICAL OXYGEN DEMAND		Method:	**A5210B-97**		Prep: A5210B / 5/19/16		Analyst: **JRF**
Biochemical Oxygen Demand	*<32.45*		15	15	mg/Kg-dry	1	5/24/2016 10:30
CHLORIDE		Method:	**A4500-CL E-97**		Prep: EXTRACT / 5/18/16		Analyst: **ED**
Chloride	**27**		**1.6**	**14**	**mg/Kg-dry**	1	5/23/2016 20:30
CYANIDE, TOTAL		Method:	**SW9012B**		Prep: SW9012B / 5/20/16		Analyst: **JB**
Cyanide, Total	**0.057**	J	**0.016**	**0.74**	**mg/Kg-dry**	1	5/25/2016 10:14

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-2
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-04
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND			Method: **E410.4 R2.0**		Prep: EXTRACT / 5/20/16		Analyst: **JJG**
Chemical Oxygen Demand	**300**	J	**130**	**720**	**mg/Kg-dry**	1	5/20/2016 15:15
MOISTURE			Method: **SW3550C**				Analyst: **EDL**
Moisture	**31**		**0.025**	**0.050**	**% of sample**	1	5/19/2016 16:14
NITROGEN, TOTAL			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total	**670**		**0**	**1.4**	**mg/Kg-dry**	1	5/24/2016 15:40
AMMONIA AS NITROGEN			Method: **A4500-NH3 G-97**		Prep: A4500-NH3 B / 5/23/16		Analyst: **JJG**
Ammonia as Nitrogen	**9.1**	J	**6.4**	**22**	**mg NH3-N/Kg-dry**	1	5/23/2016 14:37
NITROGEN, NITRITE			Method: **A4500-NO2 B**		Prep: EXTRACT / 5/20/16		Analyst: **LW**
Nitrogen, Nitrite	**0.052**	J	**0.012**	**1.0**	**mg/Kg-dry**	1	5/20/2016 15:15
NITROGEN, NITRATE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate	**0.49**	J	**0.067**	**1.4**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, NITRATE-NITRITE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**0.56**	J	**0.10**	**1.4**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, TOTAL INORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Inorganic	**9.7**		**0**	**0.029**	**mg/Kg-dry**	1	5/24/2016 15:50
NITROGEN, TOTAL ORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Organic	**660**		**1.4**	**1.4**	**mg/Kg-dry**	1	5/24/2016 15:40
PHOSPHORUS, TOTAL			Method: **E365.1 R2.0**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Total	**280**		**52**	**220**	**mg/Kg-dry**	30	5/20/2016 10:47
PH			Method: **SW9045D**		Prep: EXTRACT / 5/19/16		Analyst: **EDL**
pH	**8.5**		**0**		**s.u.**	1	5/19/2016 18:07
PHOSPHORUS, ORTHO-P (AS P)			Method: **A4500-P E-97**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**1.1**	J	**0.67**	**1.4**	**mg/Kg-dry**	1	5/20/2016 13:29
NITROGEN, TOTAL KJELDAHL			Method: **A4500-NH3 G-97**		Prep: A4500-N B / 5/23/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**670**		**33**	**70**	**mg/Kg-dry**	10	5/24/2016 13:58
ORGANIC CARBON - WALKLEY-BLACK			Method: **TITRAMETRIC**				Analyst: **KF**
Organic Carbon - W-B	**0.98**		**0.017**	**0.036**	**% by wt-dry**	1	5/23/2016 12:10

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-3
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-05
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 5/19/16		Analyst: **EB**
Aroclor 1016	U		14	120	µg/Kg-dry	1	5/21/2016 16:43
Aroclor 1221	U		14	120	µg/Kg-dry	1	5/21/2016 16:43
Aroclor 1232	U		14	120	µg/Kg-dry	1	5/21/2016 16:43
Aroclor 1242	U		14	120	µg/Kg-dry	1	5/21/2016 16:43
Aroclor 1248	U		14	120	µg/Kg-dry	1	5/21/2016 16:43
Aroclor 1254	U		18	120	µg/Kg-dry	1	5/21/2016 16:43
Aroclor 1260	U		18	120	µg/Kg-dry	1	5/21/2016 16:43
Surr: Decachlorobiphenyl	*77.1*			*40-140*	*%REC*	1	5/21/2016 16:43
Surr: Tetrachloro-m-xylene	*61.1*			*45-124*	*%REC*	1	5/21/2016 16:43
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 5/19/16		Analyst: **BLM**
4,4´-DDD	U		3.8	28	µg/Kg-dry	2	5/20/2016 17:45
4,4´-DDE	U		5.9	28	µg/Kg-dry	2	5/20/2016 17:45
4,4´-DDT	U		5.1	28	µg/Kg-dry	2	5/20/2016 17:45
Aldrin	U		4.5	28	µg/Kg-dry	2	5/20/2016 17:45
alpha-BHC	U		3.0	28	µg/Kg-dry	2	5/20/2016 17:45
alpha-Chlordane	U		4.8	28	µg/Kg-dry	2	5/20/2016 17:45
beta-BHC	U		10	28	µg/Kg-dry	2	5/20/2016 17:45
Chlordane, Technical	U		21	71	µg/Kg-dry	2	5/20/2016 17:45
delta-BHC	U		4.5	28	µg/Kg-dry	2	5/20/2016 17:45
Dieldrin	U		6.0	28	µg/Kg-dry	2	5/20/2016 17:45
Endosulfan I	U		3.7	28	µg/Kg-dry	2	5/20/2016 17:45
Endosulfan II	U		6.4	28	µg/Kg-dry	2	5/20/2016 17:45
Endosulfan sulfate	U		5.1	28	µg/Kg-dry	2	5/20/2016 17:45
Endrin	U		4.8	28	µg/Kg-dry	2	5/20/2016 17:45
Endrin aldehyde	U		12	28	µg/Kg-dry	2	5/20/2016 17:45
gamma-BHC (Lindane)	U		4.0	28	µg/Kg-dry	2	5/20/2016 17:45
Heptachlor	U		4.5	28	µg/Kg-dry	2	5/20/2016 17:45
Heptachlor epoxide	U		4.0	28	µg/Kg-dry	2	5/20/2016 17:45
Toxaphene	U		21	170	µg/Kg-dry	2	5/20/2016 17:45
Surr: Decachlorobiphenyl	*64.1*			*45-135*	*%REC*	2	5/20/2016 17:45
Surr: Tetrachloro-m-xylene	*62.1*			*45-124*	*%REC*	2	5/20/2016 17:45
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 5/20/16		Analyst: **LR**
Mercury	**0.025**		**0.0032**	**0.019**	**mg/Kg-dry**	1	5/23/2016 22:42
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Magnesium	**17,000**		**4.8**	**210**	**mg/Kg-dry**	10	5/21/2016 23:23
Potassium	**1,800**		**7.8**	**210**	**mg/Kg-dry**	10	5/21/2016 23:23
Sodium	**170**	J	**41**	**210**	**mg/Kg-dry**	10	5/21/2016 23:23

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-3
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-05
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Antimony	**0.29**	J	**0.062**	**5.1**	**mg/Kg-dry**	10	5/21/2016 04:17
Arsenic	**9.4**		**0.80**	**5.1**	**mg/Kg-dry**	10	5/21/2016 04:17
Beryllium	**0.60**	J	**0.082**	**2.1**	**mg/Kg-dry**	10	5/21/2016 04:17
Cadmium	**0.28**	J	**0.082**	**2.1**	**mg/Kg-dry**	10	5/21/2016 04:17
Chromium	**18**		**0.82**	**5.1**	**mg/Kg-dry**	10	5/21/2016 04:17
Copper	**22**		**0.27**	**5.1**	**mg/Kg-dry**	10	5/21/2016 04:17
Lead	**11**		**0.12**	**5.1**	**mg/Kg-dry**	10	5/21/2016 04:17
Nickel	**28**		**0.88**	**5.1**	**mg/Kg-dry**	10	5/21/2016 04:17
Selenium	**2.2**	J	**0.80**	**5.1**	**mg/Kg-dry**	10	5/21/2016 04:17
Silver	U		0.14	5.1	mg/Kg-dry	10	5/21/2016 04:17
Thallium	**0.32**	J	**0.14**	**5.1**	**mg/Kg-dry**	10	5/21/2016 04:17
Zinc	**64**		**2.1**	**10**	**mg/Kg-dry**	10	5/21/2016 04:17
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 5/23/16		Analyst: **RS**
1,2-Diphenylhydrazine	U		5.8	69	µg/Kg-dry	1	5/23/2016 23:05
2,4,6-Trichlorophenol	U		14	69	µg/Kg-dry	1	5/23/2016 23:05
2,4-Dichlorophenol	U		14	69	µg/Kg-dry	1	5/23/2016 23:05
2,4-Dimethylphenol	U		16	69	µg/Kg-dry	1	5/23/2016 23:05
2,4-Dinitrophenol	U		21	69	µg/Kg-dry	1	5/23/2016 23:05
2,4-Dinitrotoluene	U		10	69	µg/Kg-dry	1	5/23/2016 23:05
2,6-Dinitrotoluene	U		15	69	µg/Kg-dry	1	5/23/2016 23:05
2-Chloronaphthalene	U		3.8	14	µg/Kg-dry	1	5/23/2016 23:05
2-Chlorophenol	U		12	69	µg/Kg-dry	1	5/23/2016 23:05
2-Nitrophenol	U		18	69	µg/Kg-dry	1	5/23/2016 23:05
3,3´-Dichlorobenzidine	U		88	350	µg/Kg-dry	1	5/23/2016 23:05
4,6-Dinitro-2-methylphenol	U		10	69	µg/Kg-dry	1	5/23/2016 23:05
4-Bromophenyl phenyl ether	U		10	69	µg/Kg-dry	1	5/23/2016 23:05
4-Chloro-3-methylphenol	U		10	69	µg/Kg-dry	1	5/23/2016 23:05
4-Chlorophenyl phenyl ether	U		12	69	µg/Kg-dry	1	5/23/2016 23:05
4-Nitrophenol	U		11	69	µg/Kg-dry	1	5/23/2016 23:05
Acenaphthene	U		5.2	14	µg/Kg-dry	1	5/23/2016 23:05
Acenaphthylene	U		4.3	14	µg/Kg-dry	1	5/23/2016 23:05
Anthracene	U		6.7	14	µg/Kg-dry	1	5/23/2016 23:05
Benzidine	U		72	350	µg/Kg-dry	1	5/23/2016 23:05
Benzo(a)anthracene	**33**		**8.4**	**14**	**µg/Kg-dry**	1	5/23/2016 23:05
Benzo(a)pyrene	**15**		**2.9**	**14**	**µg/Kg-dry**	1	5/23/2016 23:05
Benzo(b)fluoranthene	**31**		**4.7**	**14**	**µg/Kg-dry**	1	5/23/2016 23:05
Benzo(g,h,i)perylene	**23**		**6.1**	**14**	**µg/Kg-dry**	1	5/23/2016 23:05
Benzo(k)fluoranthene	**13**	J	**8.7**	**14**	**µg/Kg-dry**	1	5/23/2016 23:05

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-3
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-05
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		7.0	69	µg/Kg-dry	1	5/23/2016 23:05
Bis(2-chloroethyl)ether	U		7.7	69	µg/Kg-dry	1	5/23/2016 23:05
Bis(2-chloroisopropyl)ether	U		35	69	µg/Kg-dry	1	5/23/2016 23:05
Bis(2-ethylhexyl)phthalate	U		22	69	µg/Kg-dry	1	5/23/2016 23:05
Butyl benzyl phthalate	U		19	69	µg/Kg-dry	1	5/23/2016 23:05
Chrysene	**26**		**12**	**14**	**µg/Kg-dry**	1	5/23/2016 23:05
Dibenzo(a,h)anthracene	U		4.5	14	µg/Kg-dry	1	5/23/2016 23:05
Diethyl phthalate	**33**	J	**8.9**	**69**	**µg/Kg-dry**	1	5/23/2016 23:05
Dimethyl phthalate	**26**	J	**6.9**	**69**	**µg/Kg-dry**	1	5/23/2016 23:05
Di-n-butyl phthalate	U		19	69	µg/Kg-dry	1	5/23/2016 23:05
Di-n-octyl phthalate	U		18	69	µg/Kg-dry	1	5/23/2016 23:05
Fluoranthene	**42**		**8.5**	**14**	**µg/Kg-dry**	1	5/23/2016 23:05
Fluorene	**18**		**7.7**	**14**	**µg/Kg-dry**	1	5/23/2016 23:05
Hexachlorobenzene	U		11	69	µg/Kg-dry	1	5/23/2016 23:05
Hexachlorobutadiene	U		13	69	µg/Kg-dry	1	5/23/2016 23:05
Hexachlorocyclopentadiene	U		17	69	µg/Kg-dry	1	5/23/2016 23:05
Hexachloroethane	U		29	69	µg/Kg-dry	1	5/23/2016 23:05
Indeno(1,2,3-cd)pyrene	**21**		**8.7**	**14**	**µg/Kg-dry**	1	5/23/2016 23:05
Isophorone	U		12	350	µg/Kg-dry	1	5/23/2016 23:05
Naphthalene	**38**		**3.6**	**14**	**µg/Kg-dry**	1	5/23/2016 23:05
Nitrobenzene	U		15	350	µg/Kg-dry	1	5/23/2016 23:05
N-Nitrosodimethylamine	U		63	350	µg/Kg-dry	1	5/23/2016 23:05
N-Nitrosodi-n-propylamine	U		14	69	µg/Kg-dry	1	5/23/2016 23:05
N-Nitrosodiphenylamine	U		11	69	µg/Kg-dry	1	5/23/2016 23:05
Pentachlorophenol	U		24	69	µg/Kg-dry	1	5/23/2016 23:05
Phenanthrene	**54**		**7.7**	**14**	**µg/Kg-dry**	1	5/23/2016 23:05
Phenol	U		14	69	µg/Kg-dry	1	5/23/2016 23:05
Pyrene	**44**		**11**	**14**	**µg/Kg-dry**	1	5/23/2016 23:05
Surr: 2,4,6-Tribromophenol	*76.4*			*34-140*	*%REC*	1	5/23/2016 23:05
Surr: 2-Fluorobiphenyl	*67.7*			*12-100*	*%REC*	1	5/23/2016 23:05
Surr: 2-Fluorophenol	*81.0*			*33-117*	*%REC*	1	5/23/2016 23:05
Surr: 4-Terphenyl-d14	*97.9*			*25-137*	*%REC*	1	5/23/2016 23:05
Surr: Nitrobenzene-d5	*64.7*			*37-107*	*%REC*	1	5/23/2016 23:05
Surr: Phenol-d6	*71.8*			*40-106*	*%REC*	1	5/23/2016 23:05
VOLATILE ORGANICS - METHANOL CORRECTED		Method: **SW8260A**			Prep: SW5030A / 5/20/16		Analyst: **BG**
1,1,1-Trichloroethane	U		16	57	µg/Kg-dry	1	5/20/2016 17:42
1,1,2,2-Tetrachloroethane	U		14	57	µg/Kg-dry	1	5/20/2016 17:42
1,1,2-Trichloroethane	U		17	57	µg/Kg-dry	1	5/20/2016 17:42
1,1-Dichloroethane	U		14	57	µg/Kg-dry	1	5/20/2016 17:42

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-3
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-05
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		15	57	µg/Kg-dry	1	5/20/2016 17:42
1,2-Dichlorobenzene	U		17	57	µg/Kg-dry	1	5/20/2016 17:42
1,2-Dichloroethane	U		15	57	µg/Kg-dry	1	5/20/2016 17:42
1,2-Dichloropropane	U		16	57	µg/Kg-dry	1	5/20/2016 17:42
1,3-Dichlorobenzene	U		18	57	µg/Kg-dry	1	5/20/2016 17:42
1,4-Dichlorobenzene	U		15	57	µg/Kg-dry	1	5/20/2016 17:42
Acrolein	U		170	380	µg/Kg-dry	1	5/20/2016 17:42
Acrylonitrile	U		48	190	µg/Kg-dry	1	5/20/2016 17:42
Benzene	U		13	57	µg/Kg-dry	1	5/20/2016 17:42
Bromodichloromethane	U		15	57	µg/Kg-dry	1	5/20/2016 17:42
Bromoform	U		20	57	µg/Kg-dry	1	5/20/2016 17:42
Bromomethane	U		25	140	µg/Kg-dry	1	5/20/2016 17:42
Carbon tetrachloride	U		10	57	µg/Kg-dry	1	5/20/2016 17:42
Chlorobenzene	U		17	57	µg/Kg-dry	1	5/20/2016 17:42
Chloroethane	U		36	190	µg/Kg-dry	1	5/20/2016 17:42
Chloroform	U		19	57	µg/Kg-dry	1	5/20/2016 17:42
Chloromethane	U		23	190	µg/Kg-dry	1	5/20/2016 17:42
cis-1,2-Dichloroethene	U		16	57	µg/Kg-dry	1	5/20/2016 17:42
cis-1,3-Dichloropropene	U		22	57	µg/Kg-dry	1	5/20/2016 17:42
Dibromochloromethane	U		13	57	µg/Kg-dry	1	5/20/2016 17:42
Ethylbenzene	U		13	57	µg/Kg-dry	1	5/20/2016 17:42
Methylene chloride	U		26	57	µg/Kg-dry	1	5/20/2016 17:42
Tetrachloroethene	U		28	57	µg/Kg-dry	1	5/20/2016 17:42
Toluene	**23**	J	**19**	**57**	**µg/Kg-dry**	1	5/20/2016 17:42
trans-1,2-Dichloroethene	U		16	57	µg/Kg-dry	1	5/20/2016 17:42
trans-1,3-Dichloropropene	U		10	57	µg/Kg-dry	1	5/20/2016 17:42
Trichloroethene	U		15	57	µg/Kg-dry	1	5/20/2016 17:42
Vinyl chloride	U		18	57	µg/Kg-dry	1	5/20/2016 17:42
Surr: 1,2-Dichloroethane-d4	*99.3*			*70-120*	*%REC*	1	5/20/2016 17:42
Surr: 4-Bromofluorobenzene	*96.5*			*75-120*	*%REC*	1	5/20/2016 17:42
Surr: Dibromofluoromethane	*99.5*			*85-115*	*%REC*	1	5/20/2016 17:42
Surr: Toluene-d8	*97.2*			*85-120*	*%REC*	1	5/20/2016 17:42
BIOCHEMICAL OXYGEN DEMAND			Method: **A5210B-97**		Prep: A5210B / 5/19/16		Analyst: **JRF**
Biochemical Oxygen Demand	*<32.16*		14	14	mg/Kg-dry	1	5/24/2016 10:30
CHLORIDE			Method: **A4500-CL E-97**		Prep: EXTRACT / 5/18/16		Analyst: **ED**
Chloride	**27**		**1.6**	**14**	**mg/Kg-dry**	1	5/23/2016 20:30
CYANIDE, TOTAL			Method: **SW9012B**		Prep: SW9012B / 5/20/16		Analyst: **JB**
Cyanide, Total	**0.071**	J	**0.016**	**0.73**	**mg/Kg-dry**	1	5/25/2016 10:14

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-3
Collection Date: 5/16/2016 12:30 PM

Work Order: 1605959
Lab ID: 1605959-05
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND			Method: **E410.4 R2.0**		Prep: EXTRACT / 5/20/16		Analyst: **JJG**
Chemical Oxygen Demand	**300**	J	**130**	**710**	**mg/Kg-dry**	1	5/20/2016 15:15
MOISTURE			Method: **SW3550C**				Analyst: **EDL**
Moisture	**31**		**0.025**	**0.050**	**% of sample**	1	5/19/2016 16:14
NITROGEN, TOTAL			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total	**720**		**0**	**1.4**	**mg/Kg-dry**	1	5/24/2016 15:40
AMMONIA AS NITROGEN			Method: **A4500-NH3 G-97**		Prep: A4500-NH3 B / 5/23/16		Analyst: **JJG**
Ammonia as Nitrogen	**8.8**	J	**6.1**	**20**	**mg NH3-N/Kg-dry**	1	5/23/2016 14:37
NITROGEN, NITRITE			Method: **A4500-NO2 B**		Prep: EXTRACT / 5/20/16		Analyst: **LW**
Nitrogen, Nitrite	**0.052**	J	**0.012**	**1.0**	**mg/Kg-dry**	1	5/20/2016 15:15
NITROGEN, NITRATE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate	**0.42**	J	**0.067**	**1.4**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, NITRATE-NITRITE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**0.50**	J	**0.11**	**1.4**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, TOTAL INORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Inorganic	**9.3**		**0**	**0.029**	**mg/Kg-dry**	1	5/24/2016 15:50
NITROGEN, TOTAL ORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Organic	**710**		**1.4**	**1.4**	**mg/Kg-dry**	1	5/24/2016 15:40
PHOSPHORUS, TOTAL			Method: **E365.1 R2.0**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Total	**390**		**52**	**220**	**mg/Kg-dry**	30	5/20/2016 10:47
PH			Method: **SW9045D**		Prep: EXTRACT / 5/19/16		Analyst: **EDL**
pH	**8.7**		**0**		**s.u.**	1	5/19/2016 18:07
PHOSPHORUS, ORTHO-P (AS P)			Method: **A4500-P E-97**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**1.1**	J	**0.68**	**1.4**	**mg/Kg-dry**	1	5/20/2016 13:29
NITROGEN, TOTAL KJELDAHL			Method: **A4500-NH3 G-97**		Prep: A4500-N B / 5/23/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**720**		**33**	**70**	**mg/Kg-dry**	10	5/24/2016 13:58
ORGANIC CARBON - WALKLEY-BLACK			Method: **TITRAMETRIC**				Analyst: **KF**
Organic Carbon - W-B	**0.97**		**0.017**	**0.036**	**% by wt-dry**	1	5/23/2016 12:10

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-2
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-06
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 5/19/16		Analyst: **EB**
Aroclor 1016	U		12	99	µg/Kg-dry	1	5/21/2016 17:01
Aroclor 1221	U		12	99	µg/Kg-dry	1	5/21/2016 17:01
Aroclor 1232	U		12	99	µg/Kg-dry	1	5/21/2016 17:01
Aroclor 1242	U		12	99	µg/Kg-dry	1	5/21/2016 17:01
Aroclor 1248	U		12	99	µg/Kg-dry	1	5/21/2016 17:01
Aroclor 1254	U		15	99	µg/Kg-dry	1	5/21/2016 17:01
Aroclor 1260	U		15	99	µg/Kg-dry	1	5/21/2016 17:01
Surr: Decachlorobiphenyl	*86.1*			*40-140*	*%REC*	1	5/21/2016 17:01
Surr: Tetrachloro-m-xylene	*73.1*			*45-124*	*%REC*	1	5/21/2016 17:01
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 5/19/16		Analyst: **BLM**
4,4´-DDD	U		3.2	24	µg/Kg-dry	2	5/20/2016 18:00
4,4´-DDE	U		4.9	24	µg/Kg-dry	2	5/20/2016 18:00
4,4´-DDT	U		4.3	24	µg/Kg-dry	2	5/20/2016 18:00
Aldrin	U		3.7	24	µg/Kg-dry	2	5/20/2016 18:00
alpha-BHC	U		2.5	24	µg/Kg-dry	2	5/20/2016 18:00
alpha-Chlordane	U		4.0	24	µg/Kg-dry	2	5/20/2016 18:00
beta-BHC	U		8.4	24	µg/Kg-dry	2	5/20/2016 18:00
Chlordane, Technical	U		17	59	µg/Kg-dry	2	5/20/2016 18:00
delta-BHC	U		3.7	24	µg/Kg-dry	2	5/20/2016 18:00
Dieldrin	U		5.0	24	µg/Kg-dry	2	5/20/2016 18:00
Endosulfan I	U		3.1	24	µg/Kg-dry	2	5/20/2016 18:00
Endosulfan II	U		5.3	24	µg/Kg-dry	2	5/20/2016 18:00
Endosulfan sulfate	U		4.2	24	µg/Kg-dry	2	5/20/2016 18:00
Endrin	U		4.0	24	µg/Kg-dry	2	5/20/2016 18:00
Endrin aldehyde	U		9.6	24	µg/Kg-dry	2	5/20/2016 18:00
gamma-BHC (Lindane)	U		3.3	24	µg/Kg-dry	2	5/20/2016 18:00
Heptachlor	U		3.7	24	µg/Kg-dry	2	5/20/2016 18:00
Heptachlor epoxide	U		3.3	24	µg/Kg-dry	2	5/20/2016 18:00
Toxaphene	U		18	140	µg/Kg-dry	2	5/20/2016 18:00
Surr: Decachlorobiphenyl	*72.1*			*45-135*	*%REC*	2	5/20/2016 18:00
Surr: Tetrachloro-m-xylene	*74.1*			*45-124*	*%REC*	2	5/20/2016 18:00
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 5/20/16		Analyst: **LR**
Mercury	**0.026**		**0.0029**	**0.018**	**mg/Kg-dry**	1	5/23/2016 22:49
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Magnesium	**15,000**		**4.6**	**200**	**mg/Kg-dry**	10	5/21/2016 23:47
Potassium	**1,800**		**7.5**	**200**	**mg/Kg-dry**	10	5/21/2016 23:47
Sodium	**130**	J	**40**	**200**	**mg/Kg-dry**	10	5/21/2016 23:47

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-2
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-06
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Antimony	**0.33**	J	**0.059**	**4.9**	**mg/Kg-dry**	10	5/21/2016 04:23
Arsenic	**9.1**		**0.77**	**4.9**	**mg/Kg-dry**	10	5/21/2016 04:23
Beryllium	**0.52**	J	**0.079**	**2.0**	**mg/Kg-dry**	10	5/21/2016 04:23
Cadmium	**0.25**	J	**0.079**	**2.0**	**mg/Kg-dry**	10	5/21/2016 04:23
Chromium	**19**		**0.79**	**4.9**	**mg/Kg-dry**	10	5/21/2016 04:23
Copper	**24**		**0.26**	**4.9**	**mg/Kg-dry**	10	5/21/2016 04:23
Lead	**11**		**0.12**	**4.9**	**mg/Kg-dry**	10	5/21/2016 04:23
Nickel	**32**		**0.85**	**4.9**	**mg/Kg-dry**	10	5/21/2016 04:23
Selenium	**2.0**	J	**0.77**	**4.9**	**mg/Kg-dry**	10	5/21/2016 04:23
Silver	U		0.14	4.9	mg/Kg-dry	10	5/21/2016 04:23
Thallium	**0.34**	J	**0.14**	**4.9**	**mg/Kg-dry**	10	5/21/2016 04:23
Zinc	**69**		**2.0**	**9.9**	**mg/Kg-dry**	10	5/21/2016 04:23
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 5/23/16		Analyst: **RS**
1,2-Diphenylhydrazine	U		3.4	40	µg/Kg-dry	1	5/23/2016 23:29
2,4,6-Trichlorophenol	U		7.8	40	µg/Kg-dry	1	5/23/2016 23:29
2,4-Dichlorophenol	U		8.2	40	µg/Kg-dry	1	5/23/2016 23:29
2,4-Dimethylphenol	U		9.6	40	µg/Kg-dry	1	5/23/2016 23:29
2,4-Dinitrophenol	U		12	40	µg/Kg-dry	1	5/23/2016 23:29
2,4-Dinitrotoluene	U		5.9	40	µg/Kg-dry	1	5/23/2016 23:29
2,6-Dinitrotoluene	U		8.4	40	µg/Kg-dry	1	5/23/2016 23:29
2-Chloronaphthalene	U		2.2	8.1	µg/Kg-dry	1	5/23/2016 23:29
2-Chlorophenol	U		7.2	40	µg/Kg-dry	1	5/23/2016 23:29
2-Nitrophenol	U		11	40	µg/Kg-dry	1	5/23/2016 23:29
3,3´-Dichlorobenzidine	U		51	200	µg/Kg-dry	1	5/23/2016 23:29
4,6-Dinitro-2-methylphenol	U		5.8	40	µg/Kg-dry	1	5/23/2016 23:29
4-Bromophenyl phenyl ether	U		5.9	40	µg/Kg-dry	1	5/23/2016 23:29
4-Chloro-3-methylphenol	U		5.9	40	µg/Kg-dry	1	5/23/2016 23:29
4-Chlorophenyl phenyl ether	U		7.1	40	µg/Kg-dry	1	5/23/2016 23:29
4-Nitrophenol	U		6.2	40	µg/Kg-dry	1	5/23/2016 23:29
Acenaphthene	U		3.0	8.1	µg/Kg-dry	1	5/23/2016 23:29
Acenaphthylene	U		2.5	8.1	µg/Kg-dry	1	5/23/2016 23:29
Anthracene	U		3.9	8.1	µg/Kg-dry	1	5/23/2016 23:29
Benzidine	U		42	200	µg/Kg-dry	1	5/23/2016 23:29
Benzo(a)anthracene	U		4.9	8.1	µg/Kg-dry	1	5/23/2016 23:29
Benzo(a)pyrene	U		1.7	8.1	µg/Kg-dry	1	5/23/2016 23:29
Benzo(b)fluoranthene	U		2.7	8.1	µg/Kg-dry	1	5/23/2016 23:29
Benzo(g,h,i)perylene	U		3.5	8.1	µg/Kg-dry	1	5/23/2016 23:29
Benzo(k)fluoranthene	U		5.1	8.1	µg/Kg-dry	1	5/23/2016 23:29

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ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-2
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-06
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		4.0	40	µg/Kg-dry	1	5/23/2016 23:29
Bis(2-chloroethyl)ether	U		4.5	40	µg/Kg-dry	1	5/23/2016 23:29
Bis(2-chloroisopropyl)ether	U		20	40	µg/Kg-dry	1	5/23/2016 23:29
Bis(2-ethylhexyl)phthalate	U		13	40	µg/Kg-dry	1	5/23/2016 23:29
Butyl benzyl phthalate	U		11	40	µg/Kg-dry	1	5/23/2016 23:29
Chrysene	U		6.8	8.1	µg/Kg-dry	1	5/23/2016 23:29
Dibenzo(a,h)anthracene	U		2.6	8.1	µg/Kg-dry	1	5/23/2016 23:29
Diethyl phthalate	U		5.1	40	µg/Kg-dry	1	5/23/2016 23:29
Dimethyl phthalate	**23**	J	**4.0**	**40**	**µg/Kg-dry**	1	5/23/2016 23:29
Di-n-butyl phthalate	**17**	J	**11**	**40**	**µg/Kg-dry**	1	5/23/2016 23:29
Di-n-octyl phthalate	U		11	40	µg/Kg-dry	1	5/23/2016 23:29
Fluoranthene	**14**		**5.0**	**8.1**	**µg/Kg-dry**	1	5/23/2016 23:29
Fluorene	**15**		**4.5**	**8.1**	**µg/Kg-dry**	1	5/23/2016 23:29
Hexachlorobenzene	U		6.5	40	µg/Kg-dry	1	5/23/2016 23:29
Hexachlorobutadiene	U		7.3	40	µg/Kg-dry	1	5/23/2016 23:29
Hexachlorocyclopentadiene	U		9.9	40	µg/Kg-dry	1	5/23/2016 23:29
Hexachloroethane	U		17	40	µg/Kg-dry	1	5/23/2016 23:29
Indeno(1,2,3-cd)pyrene	U		5.0	8.1	µg/Kg-dry	1	5/23/2016 23:29
Isophorone	U		7.2	200	µg/Kg-dry	1	5/23/2016 23:29
Naphthalene	**40**		**2.1**	**8.1**	**µg/Kg-dry**	1	5/23/2016 23:29
Nitrobenzene	U		8.8	200	µg/Kg-dry	1	5/23/2016 23:29
N-Nitrosodimethylamine	U		36	200	µg/Kg-dry	1	5/23/2016 23:29
N-Nitrosodi-n-propylamine	U		8.0	40	µg/Kg-dry	1	5/23/2016 23:29
N-Nitrosodiphenylamine	U		6.1	40	µg/Kg-dry	1	5/23/2016 23:29
Pentachlorophenol	U		14	40	µg/Kg-dry	1	5/23/2016 23:29
Phenanthrene	**49**		**4.5**	**8.1**	**µg/Kg-dry**	1	5/23/2016 23:29
Phenol	U		8.1	40	µg/Kg-dry	1	5/23/2016 23:29
Pyrene	**17**		**6.1**	**8.1**	**µg/Kg-dry**	1	5/23/2016 23:29
Surr: 2,4,6-Tribromophenol	*73.7*			*34-140*	*%REC*	1	5/23/2016 23:29
Surr: 2-Fluorobiphenyl	*69.6*			*12-100*	*%REC*	1	5/23/2016 23:29
Surr: 2-Fluorophenol	*82.3*			*33-117*	*%REC*	1	5/23/2016 23:29
Surr: 4-Terphenyl-d14	*96.4*			*25-137*	*%REC*	1	5/23/2016 23:29
Surr: Nitrobenzene-d5	*66.2*			*37-107*	*%REC*	1	5/23/2016 23:29
Surr: Phenol-d6	*77.1*			*40-106*	*%REC*	1	5/23/2016 23:29
VOLATILE ORGANICS - METHANOL CORRECTED		Method:	**SW8260A**		Prep: SW5030A / 5/20/16		Analyst: **BG**
1,1,1-Trichloroethane	U		13	44	µg/Kg-dry	1	5/20/2016 18:09
1,1,2,2-Tetrachloroethane	U		11	44	µg/Kg-dry	1	5/20/2016 18:09
1,1,2-Trichloroethane	U		13	44	µg/Kg-dry	1	5/20/2016 18:09
1,1-Dichloroethane	U		11	44	µg/Kg-dry	1	5/20/2016 18:09

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-2
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-06
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		12	44	µg/Kg-dry	1	5/20/2016 18:09
1,2-Dichlorobenzene	U		13	44	µg/Kg-dry	1	5/20/2016 18:09
1,2-Dichloroethane	U		12	44	µg/Kg-dry	1	5/20/2016 18:09
1,2-Dichloropropane	U		12	44	µg/Kg-dry	1	5/20/2016 18:09
1,3-Dichlorobenzene	U		14	44	µg/Kg-dry	1	5/20/2016 18:09
1,4-Dichlorobenzene	U		12	44	µg/Kg-dry	1	5/20/2016 18:09
Acrolein	U		130	290	µg/Kg-dry	1	5/20/2016 18:09
Acrylonitrile	U		37	150	µg/Kg-dry	1	5/20/2016 18:09
Benzene	U		10	44	µg/Kg-dry	1	5/20/2016 18:09
Bromodichloromethane	U		12	44	µg/Kg-dry	1	5/20/2016 18:09
Bromoform	U		16	44	µg/Kg-dry	1	5/20/2016 18:09
Bromomethane	U		19	110	µg/Kg-dry	1	5/20/2016 18:09
Carbon tetrachloride	U		7.8	44	µg/Kg-dry	1	5/20/2016 18:09
Chlorobenzene	U		13	44	µg/Kg-dry	1	5/20/2016 18:09
Chloroethane	U		28	150	µg/Kg-dry	1	5/20/2016 18:09
Chloroform	U		15	44	µg/Kg-dry	1	5/20/2016 18:09
Chloromethane	U		18	150	µg/Kg-dry	1	5/20/2016 18:09
cis-1,2-Dichloroethene	U		12	44	µg/Kg-dry	1	5/20/2016 18:09
cis-1,3-Dichloropropene	U		17	44	µg/Kg-dry	1	5/20/2016 18:09
Dibromochloromethane	U		10	44	µg/Kg-dry	1	5/20/2016 18:09
Ethylbenzene	U		10	44	µg/Kg-dry	1	5/20/2016 18:09
Methylene chloride	U		20	44	µg/Kg-dry	1	5/20/2016 18:09
Tetrachloroethene	U		22	44	µg/Kg-dry	1	5/20/2016 18:09
Toluene	**25**	J	**15**	**44**	**µg/Kg-dry**	1	5/20/2016 18:09
trans-1,2-Dichloroethene	U		12	44	µg/Kg-dry	1	5/20/2016 18:09
trans-1,3-Dichloropropene	U		7.9	44	µg/Kg-dry	1	5/20/2016 18:09
Trichloroethene	U		12	44	µg/Kg-dry	1	5/20/2016 18:09
Vinyl chloride	U		14	44	µg/Kg-dry	1	5/20/2016 18:09
Surr: 1,2-Dichloroethane-d4	*99.2*			*70-120*	*%REC*	1	5/20/2016 18:09
Surr: 4-Bromofluorobenzene	*98.2*			*75-120*	*%REC*	1	5/20/2016 18:09
Surr: Dibromofluoromethane	*97.8*			*85-115*	*%REC*	1	5/20/2016 18:09
Surr: Toluene-d8	*97.3*			*85-120*	*%REC*	1	5/20/2016 18:09
BIOCHEMICAL OXYGEN DEMAND			Method: **A5210B-97**		Prep: A5210B / 5/19/16		Analyst: **JRF**
Biochemical Oxygen Demand	*<32.29*		12	12	mg/Kg-dry	1	5/24/2016 10:30
CHLORIDE			Method: **A4500-CL E-97**		Prep: EXTRACT / 5/18/16		Analyst: **ED**
Chloride	**17**		**1.3**	**12**	**mg/Kg-dry**	1	5/23/2016 20:30
CYANIDE, TOTAL			Method: **SW9012B**		Prep: SW9012B / 5/20/16		Analyst: **JB**
Cyanide, Total	**0.042**	J	**0.013**	**0.61**	**mg/Kg-dry**	1	5/25/2016 10:14

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-2
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-06
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND			Method: **E410.4 R2.0**		Prep: EXTRACT / 5/20/16		Analyst: **JJG**
Chemical Oxygen Demand	**250**	J	**110**	**590**	**mg/Kg-dry**	1	5/20/2016 15:15
MOISTURE			Method: **SW3550C**				Analyst: **EDL**
Moisture	**19**		**0.025**	**0.050**	**% of sample**	1	5/19/2016 16:14
NITROGEN, TOTAL			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total	**600**		**0**	**1.2**	**mg/Kg-dry**	1	5/24/2016 15:40
AMMONIA AS NITROGEN			Method: **A4500-NH3 G-97**		Prep: A4500-NH3 B / 5/23/16		Analyst: **JJG**
Ammonia as Nitrogen	**12**	J	**5.7**	**19**	**mg NH3-N/Kg-dry**	1	5/23/2016 14:37
NITROGEN, NITRITE			Method: **A4500-NO2 B**		Prep: EXTRACT / 5/20/16		Analyst: **LW**
Nitrogen, Nitrite	**0.57**	J	**0.0099**	**0.86**	**mg/Kg-dry**	1	5/20/2016 15:15
NITROGEN, NITRATE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate	**0.77**	J	**0.057**	**1.2**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, NITRATE-NITRITE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**1.3**		**0.090**	**1.2**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, TOTAL INORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Inorganic	**12**		**0**	**0.025**	**mg/Kg-dry**	1	5/24/2016 15:50
NITROGEN, TOTAL ORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Organic	**580**		**1.2**	**1.2**	**mg/Kg-dry**	1	5/24/2016 15:40
PHOSPHORUS, TOTAL			Method: **E365.1 R2.0**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Total	**300**		**44**	**180**	**mg/Kg-dry**	30	5/20/2016 10:47
PH			Method: **SW9045D**		Prep: EXTRACT / 5/19/16		Analyst: **EDL**
pH	**8.5**		**0**		**s.u.**	1	5/19/2016 18:07
PHOSPHORUS, ORTHO-P (AS P)			Method: **A4500-P E-97**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**1.2**		**0.58**	**1.2**	**mg/Kg-dry**	1	5/20/2016 13:29
NITROGEN, TOTAL KJELDAHL			Method: **A4500-NH3 G-97**		Prep: A4500-N B / 5/23/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**590**		**28**	**60**	**mg/Kg-dry**	10	5/24/2016 13:58
ORGANIC CARBON - WALKLEY-BLACK			Method: **TITRAMETRIC**				Analyst: **KF**
Organic Carbon - W-B	**0.73**		**0.015**	**0.031**	**% by wt-dry**	1	5/23/2016 12:10

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-3
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-07
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 5/19/16		Analyst: **EB**
Aroclor 1016	U		11	97	µg/Kg-dry	1	5/21/2016 17:18
Aroclor 1221	U		11	97	µg/Kg-dry	1	5/21/2016 17:18
Aroclor 1232	U		11	97	µg/Kg-dry	1	5/21/2016 17:18
Aroclor 1242	U		11	97	µg/Kg-dry	1	5/21/2016 17:18
Aroclor 1248	U		11	97	µg/Kg-dry	1	5/21/2016 17:18
Aroclor 1254	U		14	97	µg/Kg-dry	1	5/21/2016 17:18
Aroclor 1260	U		14	97	µg/Kg-dry	1	5/21/2016 17:18
Surr: Decachlorobiphenyl	*87.1*			*40-140*	*%REC*	1	5/21/2016 17:18
Surr: Tetrachloro-m-xylene	*78.1*			*45-124*	*%REC*	1	5/21/2016 17:18
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 5/19/16		Analyst: **BLM**
4,4´-DDD	U		3.1	23	µg/Kg-dry	2	5/20/2016 18:16
4,4´-DDE	U		4.8	23	µg/Kg-dry	2	5/20/2016 18:16
4,4´-DDT	U		4.2	23	µg/Kg-dry	2	5/20/2016 18:16
Aldrin	U		3.6	23	µg/Kg-dry	2	5/20/2016 18:16
alpha-BHC	U		2.4	23	µg/Kg-dry	2	5/20/2016 18:16
alpha-Chlordane	U		3.9	23	µg/Kg-dry	2	5/20/2016 18:16
beta-BHC	U		8.3	23	µg/Kg-dry	2	5/20/2016 18:16
Chlordane, Technical	U		17	58	µg/Kg-dry	2	5/20/2016 18:16
delta-BHC	U		3.6	23	µg/Kg-dry	2	5/20/2016 18:16
Dieldrin	U		4.9	23	µg/Kg-dry	2	5/20/2016 18:16
Endosulfan I	U		3.1	23	µg/Kg-dry	2	5/20/2016 18:16
Endosulfan II	U		5.2	23	µg/Kg-dry	2	5/20/2016 18:16
Endosulfan sulfate	U		4.2	23	µg/Kg-dry	2	5/20/2016 18:16
Endrin	U		3.9	23	µg/Kg-dry	2	5/20/2016 18:16
Endrin aldehyde	U		9.4	23	µg/Kg-dry	2	5/20/2016 18:16
gamma-BHC (Lindane)	U		3.3	23	µg/Kg-dry	2	5/20/2016 18:16
Heptachlor	U		3.6	23	µg/Kg-dry	2	5/20/2016 18:16
Heptachlor epoxide	U		3.3	23	µg/Kg-dry	2	5/20/2016 18:16
Toxaphene	U		17	140	µg/Kg-dry	2	5/20/2016 18:16
Surr: Decachlorobiphenyl	*66.1*			*45-135*	*%REC*	2	5/20/2016 18:16
Surr: Tetrachloro-m-xylene	*76.1*			*45-124*	*%REC*	2	5/20/2016 18:16
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 5/20/16		Analyst: **LR**
Mercury	**0.028**		**0.0030**	**0.018**	**mg/Kg-dry**	1	5/23/2016 22:51
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Magnesium	**15,000**		**3.7**	**160**	**mg/Kg-dry**	10	5/21/2016 23:53
Potassium	**1,700**		**6.0**	**160**	**mg/Kg-dry**	10	5/21/2016 23:53
Sodium	**130**	J	**32**	**160**	**mg/Kg-dry**	10	5/21/2016 23:53

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-3
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-07
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Antimony	**0.37**	J	**0.048**	**4.0**	**mg/Kg-dry**	10	5/21/2016 04:30
Arsenic	**9.8**		**0.62**	**4.0**	**mg/Kg-dry**	10	5/21/2016 04:30
Beryllium	**0.61**	J	**0.064**	**1.6**	**mg/Kg-dry**	10	5/21/2016 04:30
Cadmium	**0.30**	J	**0.064**	**1.6**	**mg/Kg-dry**	10	5/21/2016 04:30
Chromium	**21**		**0.64**	**4.0**	**mg/Kg-dry**	10	5/21/2016 04:30
Copper	**26**		**0.21**	**4.0**	**mg/Kg-dry**	10	5/21/2016 04:30
Lead	**12**		**0.095**	**4.0**	**mg/Kg-dry**	10	5/21/2016 04:30
Nickel	**36**		**0.68**	**4.0**	**mg/Kg-dry**	10	5/21/2016 04:30
Selenium	**2.1**	J	**0.62**	**4.0**	**mg/Kg-dry**	10	5/21/2016 04:30
Silver	U		0.11	4.0	mg/Kg-dry	10	5/21/2016 04:30
Thallium	**0.44**	J	**0.11**	**4.0**	**mg/Kg-dry**	10	5/21/2016 04:30
Zinc	**75**		**1.6**	**7.9**	**mg/Kg-dry**	10	5/21/2016 04:30
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 5/23/16		Analyst: **RS**
1,2-Diphenylhydrazine	U		3.4	40	µg/Kg-dry	1	5/23/2016 19:55
2,4,6-Trichlorophenol	U		7.9	40	µg/Kg-dry	1	5/23/2016 19:55
2,4-Dichlorophenol	U		8.3	40	µg/Kg-dry	1	5/23/2016 19:55
2,4-Dimethylphenol	U		9.6	40	µg/Kg-dry	1	5/23/2016 19:55
2,4-Dinitrophenol	U		12	40	µg/Kg-dry	1	5/23/2016 19:55
2,4-Dinitrotoluene	U		5.9	40	µg/Kg-dry	1	5/23/2016 19:55
2,6-Dinitrotoluene	U		8.5	40	µg/Kg-dry	1	5/23/2016 19:55
2-Chloronaphthalene	U		2.2	8.1	µg/Kg-dry	1	5/23/2016 19:55
2-Chlorophenol	U		7.2	40	µg/Kg-dry	1	5/23/2016 19:55
2-Nitrophenol	U		11	40	µg/Kg-dry	1	5/23/2016 19:55
3,3´-Dichlorobenzidine	U		51	200	µg/Kg-dry	1	5/23/2016 19:55
4,6-Dinitro-2-methylphenol	**47**		**5.8**	**40**	**µg/Kg-dry**	1	5/23/2016 19:55
4-Bromophenyl phenyl ether	U		5.9	40	µg/Kg-dry	1	5/23/2016 19:55
4-Chloro-3-methylphenol	U		5.9	40	µg/Kg-dry	1	5/23/2016 19:55
4-Chlorophenyl phenyl ether	U		7.1	40	µg/Kg-dry	1	5/23/2016 19:55
4-Nitrophenol	U		6.2	40	µg/Kg-dry	1	5/23/2016 19:55
Acenaphthene	U		3.0	8.1	µg/Kg-dry	1	5/23/2016 19:55
Acenaphthylene	U		2.5	8.1	µg/Kg-dry	1	5/23/2016 19:55
Anthracene	U		3.9	8.1	µg/Kg-dry	1	5/23/2016 19:55
Benzidine	U		42	200	µg/Kg-dry	1	5/23/2016 19:55
Benzo(a)anthracene	U		4.9	8.1	µg/Kg-dry	1	5/23/2016 19:55
Benzo(a)pyrene	U		1.7	8.1	µg/Kg-dry	1	5/23/2016 19:55
Benzo(b)fluoranthene	U		2.8	8.1	µg/Kg-dry	1	5/23/2016 19:55
Benzo(g,h,i)perylene	U		3.5	8.1	µg/Kg-dry	1	5/23/2016 19:55
Benzo(k)fluoranthene	U		5.1	8.1	µg/Kg-dry	1	5/23/2016 19:55

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-3
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-07
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		4.1	40	µg/Kg-dry	1	5/23/2016 19:55
Bis(2-chloroethyl)ether	U		4.5	40	µg/Kg-dry	1	5/23/2016 19:55
Bis(2-chloroisopropyl)ether	U		21	40	µg/Kg-dry	1	5/23/2016 19:55
Bis(2-ethylhexyl)phthalate	U		13	40	µg/Kg-dry	1	5/23/2016 19:55
Butyl benzyl phthalate	U		11	40	µg/Kg-dry	1	5/23/2016 19:55
Chrysene	U		6.8	8.1	µg/Kg-dry	1	5/23/2016 19:55
Dibenzo(a,h)anthracene	U		2.6	8.1	µg/Kg-dry	1	5/23/2016 19:55
Diethyl phthalate	**32**	J	**5.2**	**40**	**µg/Kg-dry**	1	5/23/2016 19:55
Dimethyl phthalate	**24**	J	**4.0**	**40**	**µg/Kg-dry**	1	5/23/2016 19:55
Di-n-butyl phthalate	U		11	40	µg/Kg-dry	1	5/23/2016 19:55
Di-n-octyl phthalate	U		11	40	µg/Kg-dry	1	5/23/2016 19:55
Fluoranthene	**21**		**5.0**	**8.1**	**µg/Kg-dry**	1	5/23/2016 19:55
Fluorene	**19**		**4.5**	**8.1**	**µg/Kg-dry**	1	5/23/2016 19:55
Hexachlorobenzene	U		6.5	40	µg/Kg-dry	1	5/23/2016 19:55
Hexachlorobutadiene	U		7.3	40	µg/Kg-dry	1	5/23/2016 19:55
Hexachlorocyclopentadiene	U		9.9	40	µg/Kg-dry	1	5/23/2016 19:55
Hexachloroethane	U		17	40	µg/Kg-dry	1	5/23/2016 19:55
Indeno(1,2,3-cd)pyrene	U		5.0	8.1	µg/Kg-dry	1	5/23/2016 19:55
Isophorone	U		7.2	200	µg/Kg-dry	1	5/23/2016 19:55
Naphthalene	**44**		**2.1**	**8.1**	**µg/Kg-dry**	1	5/23/2016 19:55
Nitrobenzene	U		8.8	200	µg/Kg-dry	1	5/23/2016 19:55
N-Nitrosodimethylamine	U		36	200	µg/Kg-dry	1	5/23/2016 19:55
N-Nitrosodi-n-propylamine	U		8.0	40	µg/Kg-dry	1	5/23/2016 19:55
N-Nitrosodiphenylamine	U		6.1	40	µg/Kg-dry	1	5/23/2016 19:55
Pentachlorophenol	U		14	40	µg/Kg-dry	1	5/23/2016 19:55
Phenanthrene	**59**		**4.5**	**8.1**	**µg/Kg-dry**	1	5/23/2016 19:55
Phenol	U		8.1	40	µg/Kg-dry	1	5/23/2016 19:55
Pyrene	**29**		**6.1**	**8.1**	**µg/Kg-dry**	1	5/23/2016 19:55
Surr: 2,4,6-Tribromophenol	*87.4*			*34-140*	*%REC*	1	5/23/2016 19:55
Surr: 2-Fluorobiphenyl	*77.4*			*12-100*	*%REC*	1	5/23/2016 19:55
Surr: 2-Fluorophenol	*92.7*			*33-117*	*%REC*	1	5/23/2016 19:55
Surr: 4-Terphenyl-d14	*115*			*25-137*	*%REC*	1	5/23/2016 19:55
Surr: Nitrobenzene-d5	*74.5*			*37-107*	*%REC*	1	5/23/2016 19:55
Surr: Phenol-d6	*83.2*			*40-106*	*%REC*	1	5/23/2016 19:55
VOLATILE ORGANICS - METHANOL CORRECTED		Method: **SW8260A**			Prep: SW5030A / 5/20/16		Analyst: **BG**
1,1,1-Trichloroethane	U		12	43	µg/Kg-dry	1	5/20/2016 18:35
1,1,2,2-Tetrachloroethane	U		10	43	µg/Kg-dry	1	5/20/2016 18:35
1,1,2-Trichloroethane	U		13	43	µg/Kg-dry	1	5/20/2016 18:35
1,1-Dichloroethane	U		11	43	µg/Kg-dry	1	5/20/2016 18:35

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-3
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-07
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		12	43	µg/Kg-dry	1	5/20/2016 18:35
1,2-Dichlorobenzene	U		13	43	µg/Kg-dry	1	5/20/2016 18:35
1,2-Dichloroethane	U		12	43	µg/Kg-dry	1	5/20/2016 18:35
1,2-Dichloropropane	U		12	43	µg/Kg-dry	1	5/20/2016 18:35
1,3-Dichlorobenzene	U		14	43	µg/Kg-dry	1	5/20/2016 18:35
1,4-Dichlorobenzene	U		11	43	µg/Kg-dry	1	5/20/2016 18:35
Acrolein	U		130	290	µg/Kg-dry	1	5/20/2016 18:35
Acrylonitrile	U		36	140	µg/Kg-dry	1	5/20/2016 18:35
Benzene	U		9.8	43	µg/Kg-dry	1	5/20/2016 18:35
Bromodichloromethane	U		12	43	µg/Kg-dry	1	5/20/2016 18:35
Bromoform	U		15	43	µg/Kg-dry	1	5/20/2016 18:35
Bromomethane	U		19	110	µg/Kg-dry	1	5/20/2016 18:35
Carbon tetrachloride	U		7.7	43	µg/Kg-dry	1	5/20/2016 18:35
Chlorobenzene	U		13	43	µg/Kg-dry	1	5/20/2016 18:35
Chloroethane	U		27	140	µg/Kg-dry	1	5/20/2016 18:35
Chloroform	U		15	43	µg/Kg-dry	1	5/20/2016 18:35
Chloromethane	U		17	140	µg/Kg-dry	1	5/20/2016 18:35
cis-1,2-Dichloroethene	U		12	43	µg/Kg-dry	1	5/20/2016 18:35
cis-1,3-Dichloropropene	U		17	43	µg/Kg-dry	1	5/20/2016 18:35
Dibromochloromethane	U		9.8	43	µg/Kg-dry	1	5/20/2016 18:35
Ethylbenzene	U		10	43	µg/Kg-dry	1	5/20/2016 18:35
Methylene chloride	U		20	43	µg/Kg-dry	1	5/20/2016 18:35
Tetrachloroethene	U		21	43	µg/Kg-dry	1	5/20/2016 18:35
Toluene	**24**	J	**14**	**43**	**µg/Kg-dry**	1	5/20/2016 18:35
trans-1,2-Dichloroethene	U		12	43	µg/Kg-dry	1	5/20/2016 18:35
trans-1,3-Dichloropropene	U		7.7	43	µg/Kg-dry	1	5/20/2016 18:35
Trichloroethene	U		12	43	µg/Kg-dry	1	5/20/2016 18:35
Vinyl chloride	U		14	43	µg/Kg-dry	1	5/20/2016 18:35
Surr: 1,2-Dichloroethane-d4	*99.6*			*70-120*	*%REC*	1	5/20/2016 18:35
Surr: 4-Bromofluorobenzene	*98.2*			*75-120*	*%REC*	1	5/20/2016 18:35
Surr: Dibromofluoromethane	*101*			*85-115*	*%REC*	1	5/20/2016 18:35
Surr: Toluene-d8	*97.6*			*85-120*	*%REC*	1	5/20/2016 18:35
BIOCHEMICAL OXYGEN DEMAND			Method: **A5210B-97**		Prep: A5210B / 5/19/16		Analyst: **JRF**
Biochemical Oxygen Demand	*<32.45*		12	12	mg/Kg-dry	1	5/24/2016 10:30
CHLORIDE			Method: **A4500-CL E-97**		Prep: EXTRACT / 5/18/16		Analyst: **ED**
Chloride	**14**		**1.3**	**12**	**mg/Kg-dry**	1	5/23/2016 20:30
CYANIDE, TOTAL			Method: **SW9012B**		Prep: SW9012B / 5/20/16		Analyst: **JB**
Cyanide, Total	**0.044**	J	**0.014**	**0.62**	**mg/Kg-dry**	1	5/25/2016 10:14

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-3
Collection Date: 5/16/2016 01:00 PM

Work Order: 1605959
Lab ID: 1605959-07
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND			Method: **E410.4 R2.0**		Prep: EXTRACT / 5/20/16		Analyst: **JJG**
Chemical Oxygen Demand	**230**	J	**110**	**610**	**mg/Kg-dry**	1	5/20/2016 15:15
MOISTURE			Method: **SW3550C**				Analyst: **EDL**
Moisture	**18**		**0.025**	**0.050**	**% of sample**	1	5/19/2016 16:14
NITROGEN, TOTAL			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total	**560**		**0**	**1.2**	**mg/Kg-dry**	1	5/24/2016 15:40
AMMONIA AS NITROGEN			Method: **A4500-NH3 G-97**		Prep: A4500-NH3 B / 5/23/16		Analyst: **JJG**
Ammonia as Nitrogen	**5.7**	J	**5.0**	**17**	**mg NH3-N/Kg-dry**	1	5/23/2016 14:37
NITROGEN, NITRITE			Method: **A4500-NO2 B**		Prep: EXTRACT / 5/20/16		Analyst: **LW**
Nitrogen, Nitrite	**0.065**	J	**0.0098**	**0.86**	**mg/Kg-dry**	1	5/20/2016 15:15
NITROGEN, NITRATE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate	**1.1**	J	**0.060**	**1.2**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, NITRATE-NITRITE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**1.1**	J	**0.095**	**1.2**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, TOTAL INORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Inorganic	**6.9**		**0**	**0.024**	**mg/Kg-dry**	1	5/24/2016 15:50
NITROGEN, TOTAL ORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Organic	**560**		**1.2**	**1.2**	**mg/Kg-dry**	1	5/24/2016 15:40
PHOSPHORUS, TOTAL			Method: **E365.1 R2.0**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Total	**290**		**43**	**180**	**mg/Kg-dry**	30	5/20/2016 10:47
PH			Method: **SW9045D**		Prep: EXTRACT / 5/19/16		Analyst: **EDL**
pH	**8.4**		**0**		**s.u.**	1	5/19/2016 18:07
PHOSPHORUS, ORTHO-P (AS P)			Method: **A4500-P E-97**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**1.3**		**0.57**	**1.2**	**mg/Kg-dry**	1	5/20/2016 13:29
NITROGEN, TOTAL KJELDAHL			Method: **A4500-NH3 G-97**		Prep: A4500-N B / 5/23/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**560**		**27**	**59**	**mg/Kg-dry**	10	5/24/2016 13:58
ORGANIC CARBON - WALKLEY-BLACK			Method: **TITRAMETRIC**				Analyst: **KF**
Organic Carbon - W-B	**0.70**		**0.015**	**0.031**	**% by wt-dry**	1	5/23/2016 12:10

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-2
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-08
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 5/19/16		Analyst: **EB**
Aroclor 1016	U		16	130	µg/Kg-dry	1	5/21/2016 17:36
Aroclor 1221	U		16	130	µg/Kg-dry	1	5/21/2016 17:36
Aroclor 1232	U		16	130	µg/Kg-dry	1	5/21/2016 17:36
Aroclor 1242	U		16	130	µg/Kg-dry	1	5/21/2016 17:36
Aroclor 1248	U		16	130	µg/Kg-dry	1	5/21/2016 17:36
Aroclor 1254	U		20	130	µg/Kg-dry	1	5/21/2016 17:36
Aroclor 1260	U		20	130	µg/Kg-dry	1	5/21/2016 17:36
Surr: Decachlorobiphenyl	*90.1*			*40-140*	*%REC*	1	5/21/2016 17:36
Surr: Tetrachloro-m-xylene	*74.1*			*45-124*	*%REC*	1	5/21/2016 17:36
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 5/19/16		Analyst: **BLM**
4,4´-DDD	U		4.2	32	µg/Kg-dry	2	5/20/2016 18:32
4,4´-DDE	U		6.6	32	µg/Kg-dry	2	5/20/2016 18:32
4,4´-DDT	U		5.7	32	µg/Kg-dry	2	5/20/2016 18:32
Aldrin	U		5.0	32	µg/Kg-dry	2	5/20/2016 18:32
alpha-BHC	U		3.3	32	µg/Kg-dry	2	5/20/2016 18:32
alpha-Chlordane	U		5.4	32	µg/Kg-dry	2	5/20/2016 18:32
beta-BHC	U		11	32	µg/Kg-dry	2	5/20/2016 18:32
Chlordane, Technical	U		23	79	µg/Kg-dry	2	5/20/2016 18:32
delta-BHC	U		5.0	32	µg/Kg-dry	2	5/20/2016 18:32
Dieldrin	U		6.6	32	µg/Kg-dry	2	5/20/2016 18:32
Endosulfan I	U		4.2	32	µg/Kg-dry	2	5/20/2016 18:32
Endosulfan II	U		7.1	32	µg/Kg-dry	2	5/20/2016 18:32
Endosulfan sulfate	U		5.7	32	µg/Kg-dry	2	5/20/2016 18:32
Endrin	U		5.4	32	µg/Kg-dry	2	5/20/2016 18:32
Endrin aldehyde	U		13	32	µg/Kg-dry	2	5/20/2016 18:32
gamma-BHC (Lindane)	U		4.5	32	µg/Kg-dry	2	5/20/2016 18:32
Heptachlor	U		5.0	32	µg/Kg-dry	2	5/20/2016 18:32
Heptachlor epoxide	U		4.5	32	µg/Kg-dry	2	5/20/2016 18:32
Toxaphene	U		23	190	µg/Kg-dry	2	5/20/2016 18:32
Surr: Decachlorobiphenyl	*74.1*			*45-135*	*%REC*	2	5/20/2016 18:32
Surr: Tetrachloro-m-xylene	*70.1*			*45-124*	*%REC*	2	5/20/2016 18:32
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 5/20/16		Analyst: **LR**
Mercury	**0.024**		**0.0033**	**0.020**	**mg/Kg-dry**	1	5/23/2016 22:53
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Magnesium	**23,000**		**6.1**	**260**	**mg/Kg-dry**	10	5/22/2016 00:11
Potassium	**1,700**		**9.9**	**260**	**mg/Kg-dry**	10	5/22/2016 00:11
Sodium	**190**	J	**53**	**260**	**mg/Kg-dry**	10	5/22/2016 00:11

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-2
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-08
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Antimony	**0.36**	J	**0.078**	**6.5**	**mg/Kg-dry**	10	5/21/2016 04:49
Arsenic	**10**		**1.0**	**6.5**	**mg/Kg-dry**	10	5/21/2016 04:49
Beryllium	**0.50**	J	**0.10**	**2.6**	**mg/Kg-dry**	10	5/21/2016 04:49
Cadmium	**0.34**	J	**0.10**	**2.6**	**mg/Kg-dry**	10	5/21/2016 04:49
Chromium	**15**		**1.0**	**6.5**	**mg/Kg-dry**	10	5/21/2016 04:49
Copper	**22**		**0.34**	**6.5**	**mg/Kg-dry**	10	5/21/2016 04:49
Lead	**10**		**0.16**	**6.5**	**mg/Kg-dry**	10	5/21/2016 04:49
Nickel	**27**		**1.1**	**6.5**	**mg/Kg-dry**	10	5/21/2016 04:49
Selenium	**1.9**	J	**1.0**	**6.5**	**mg/Kg-dry**	10	5/21/2016 04:49
Silver	U		0.18	6.5	mg/Kg-dry	10	5/21/2016 04:49
Thallium	**0.39**	J	**0.18**	**6.5**	**mg/Kg-dry**	10	5/21/2016 04:49
Zinc	**63**		**2.6**	**13**	**mg/Kg-dry**	10	5/21/2016 04:49
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 5/23/16		Analyst: **RS**
1,2-Diphenylhydrazine	U		5.6	66	µg/Kg-dry	1	5/24/2016 21:54
2,4,6-Trichlorophenol	U		13	66	µg/Kg-dry	1	5/24/2016 21:54
2,4-Dichlorophenol	U		14	66	µg/Kg-dry	1	5/24/2016 21:54
2,4-Dimethylphenol	U		16	66	µg/Kg-dry	1	5/24/2016 21:54
2,4-Dinitrophenol	U		20	66	µg/Kg-dry	1	5/24/2016 21:54
2,4-Dinitrotoluene	U		9.8	66	µg/Kg-dry	1	5/24/2016 21:54
2,6-Dinitrotoluene	U		14	66	µg/Kg-dry	1	5/24/2016 21:54
2-Chloronaphthalene	U		3.6	13	µg/Kg-dry	1	5/24/2016 21:54
2-Chlorophenol	U		12	66	µg/Kg-dry	1	5/24/2016 21:54
2-Nitrophenol	U		18	66	µg/Kg-dry	1	5/24/2016 21:54
3,3´-Dichlorobenzidine	U		85	340	µg/Kg-dry	1	5/24/2016 21:54
4,6-Dinitro-2-methylphenol	U		9.6	66	µg/Kg-dry	1	5/24/2016 21:54
4-Bromophenyl phenyl ether	U		9.8	66	µg/Kg-dry	1	5/24/2016 21:54
4-Chloro-3-methylphenol	U		9.8	66	µg/Kg-dry	1	5/24/2016 21:54
4-Chlorophenyl phenyl ether	U		12	66	µg/Kg-dry	1	5/24/2016 21:54
4-Nitrophenol	U		10	66	µg/Kg-dry	1	5/24/2016 21:54
Acenaphthene	U		5.0	13	µg/Kg-dry	1	5/24/2016 21:54
Acenaphthylene	U		4.1	13	µg/Kg-dry	1	5/24/2016 21:54
Anthracene	U		6.5	13	µg/Kg-dry	1	5/24/2016 21:54
Benzidine	U		69	340	µg/Kg-dry	1	5/24/2016 21:54
Benzo(a)anthracene	U		8.1	13	µg/Kg-dry	1	5/24/2016 21:54
Benzo(a)pyrene	U		2.8	13	µg/Kg-dry	1	5/24/2016 21:54
Benzo(b)fluoranthene	U		4.6	13	µg/Kg-dry	1	5/24/2016 21:54
Benzo(g,h,i)perylene	U		5.9	13	µg/Kg-dry	1	5/24/2016 21:54
Benzo(k)fluoranthene	U		8.4	13	µg/Kg-dry	1	5/24/2016 21:54

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-2
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-08
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		6.7	66	µg/Kg-dry	1	5/24/2016 21:54
Bis(2-chloroethyl)ether	U		7.4	66	µg/Kg-dry	1	5/24/2016 21:54
Bis(2-chloroisopropyl)ether	U		34	66	µg/Kg-dry	1	5/24/2016 21:54
Bis(2-ethylhexyl)phthalate	U		21	66	µg/Kg-dry	1	5/24/2016 21:54
Butyl benzyl phthalate	U		19	66	µg/Kg-dry	1	5/24/2016 21:54
Chrysene	U		11	13	µg/Kg-dry	1	5/24/2016 21:54
Dibenzo(a,h)anthracene	U		4.4	13	µg/Kg-dry	1	5/24/2016 21:54
Diethyl phthalate	**46**	J	**8.6**	**66**	**µg/Kg-dry**	1	5/24/2016 21:54
Dimethyl phthalate	**31**	J	**6.7**	**66**	**µg/Kg-dry**	1	5/24/2016 21:54
Di-n-butyl phthalate	U		18	66	µg/Kg-dry	1	5/24/2016 21:54
Di-n-octyl phthalate	U		18	66	µg/Kg-dry	1	5/24/2016 21:54
Fluoranthene	**13**		**8.2**	**13**	**µg/Kg-dry**	1	5/24/2016 21:54
Fluorene	**11**	J	**7.5**	**13**	**µg/Kg-dry**	1	5/24/2016 21:54
Hexachlorobenzene	U		11	66	µg/Kg-dry	1	5/24/2016 21:54
Hexachlorobutadiene	U		12	66	µg/Kg-dry	1	5/24/2016 21:54
Hexachlorocyclopentadiene	U		16	66	µg/Kg-dry	1	5/24/2016 21:54
Hexachloroethane	U		28	66	µg/Kg-dry	1	5/24/2016 21:54
Indeno(1,2,3-cd)pyrene	U		8.4	13	µg/Kg-dry	1	5/24/2016 21:54
Isophorone	**130**	J	**12**	**340**	**µg/Kg-dry**	1	5/24/2016 21:54
Naphthalene	**32**		**3.5**	**13**	**µg/Kg-dry**	1	5/24/2016 21:54
Nitrobenzene	U		15	340	µg/Kg-dry	1	5/24/2016 21:54
N-Nitrosodimethylamine	U		60	340	µg/Kg-dry	1	5/24/2016 21:54
N-Nitrosodi-n-propylamine	U		13	66	µg/Kg-dry	1	5/24/2016 21:54
N-Nitrosodiphenylamine	U		10	66	µg/Kg-dry	1	5/24/2016 21:54
Pentachlorophenol	U		23	66	µg/Kg-dry	1	5/24/2016 21:54
Phenanthrene	**31**		**7.4**	**13**	**µg/Kg-dry**	1	5/24/2016 21:54
Phenol	U		13	66	µg/Kg-dry	1	5/24/2016 21:54
Pyrene	**11**	J	**10**	**13**	**µg/Kg-dry**	1	5/24/2016 21:54
Surr: 2,4,6-Tribromophenol	*53.3*			*34-140*	*%REC*	1	5/24/2016 21:54
Surr: 2-Fluorobiphenyl	*71.4*			*12-100*	*%REC*	1	5/24/2016 21:54
Surr: 2-Fluorophenol	*88.6*			*33-117*	*%REC*	1	5/24/2016 21:54
Surr: 4-Terphenyl-d14	*101*			*25-137*	*%REC*	1	5/24/2016 21:54
Surr: Nitrobenzene-d5	*70.9*			*37-107*	*%REC*	1	5/24/2016 21:54
Surr: Phenol-d6	*84.0*			*40-106*	*%REC*	1	5/24/2016 21:54
VOLATILE ORGANICS - METHANOL CORRECTED		Method: **SW8260A**			Prep: SW5030A / 5/20/16		Analyst: **BG**
1,1,1-Trichloroethane	U		19	65	µg/Kg-dry	1	5/20/2016 19:01
1,1,2,2-Tetrachloroethane	U		16	65	µg/Kg-dry	1	5/20/2016 19:01
1,1,2-Trichloroethane	U		20	65	µg/Kg-dry	1	5/20/2016 19:01
1,1-Dichloroethane	U		17	65	µg/Kg-dry	1	5/20/2016 19:01

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-2
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-08
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		18	65	µg/Kg-dry	1	5/20/2016 19:01
1,2-Dichlorobenzene	U		19	65	µg/Kg-dry	1	5/20/2016 19:01
1,2-Dichloroethane	U		18	65	µg/Kg-dry	1	5/20/2016 19:01
1,2-Dichloropropane	U		18	65	µg/Kg-dry	1	5/20/2016 19:01
1,3-Dichlorobenzene	U		21	65	µg/Kg-dry	1	5/20/2016 19:01
1,4-Dichlorobenzene	U		17	65	µg/Kg-dry	1	5/20/2016 19:01
Acrolein	U		200	430	µg/Kg-dry	1	5/20/2016 19:01
Acrylonitrile	U		55	220	µg/Kg-dry	1	5/20/2016 19:01
Benzene	U		15	65	µg/Kg-dry	1	5/20/2016 19:01
Bromodichloromethane	U		17	65	µg/Kg-dry	1	5/20/2016 19:01
Bromoform	U		23	65	µg/Kg-dry	1	5/20/2016 19:01
Bromomethane	U		28	160	µg/Kg-dry	1	5/20/2016 19:01
Carbon tetrachloride	U		12	65	µg/Kg-dry	1	5/20/2016 19:01
Chlorobenzene	U		20	65	µg/Kg-dry	1	5/20/2016 19:01
Chloroethane	U		42	220	µg/Kg-dry	1	5/20/2016 19:01
Chloroform	U		22	65	µg/Kg-dry	1	5/20/2016 19:01
Chloromethane	U		26	220	µg/Kg-dry	1	5/20/2016 19:01
cis-1,2-Dichloroethene	U		18	65	µg/Kg-dry	1	5/20/2016 19:01
cis-1,3-Dichloropropene	U		25	65	µg/Kg-dry	1	5/20/2016 19:01
Dibromochloromethane	U		15	65	µg/Kg-dry	1	5/20/2016 19:01
Ethylbenzene	U		15	65	µg/Kg-dry	1	5/20/2016 19:01
Methylene chloride	U		30	65	µg/Kg-dry	1	5/20/2016 19:01
Tetrachloroethene	U		32	65	µg/Kg-dry	1	5/20/2016 19:01
Toluene	**25**	J	**22**	**65**	**µg/Kg-dry**	1	5/20/2016 19:01
trans-1,2-Dichloroethene	U		18	65	µg/Kg-dry	1	5/20/2016 19:01
trans-1,3-Dichloropropene	U		12	65	µg/Kg-dry	1	5/20/2016 19:01
Trichloroethene	U		17	65	µg/Kg-dry	1	5/20/2016 19:01
Vinyl chloride	U		21	65	µg/Kg-dry	1	5/20/2016 19:01
Surr: 1,2-Dichloroethane-d4	*98.7*			*70-120*	*%REC*	1	5/20/2016 19:01
Surr: 4-Bromofluorobenzene	*96.5*			*75-120*	*%REC*	1	5/20/2016 19:01
Surr: Dibromofluoromethane	*98.2*			*85-115*	*%REC*	1	5/20/2016 19:01
Surr: Toluene-d8	*97.4*			*85-120*	*%REC*	1	5/20/2016 19:01
BIOCHEMICAL OXYGEN DEMAND			Method: **A5210B-97**		Prep: A5210B / 5/19/16		Analyst: **JRF**
Biochemical Oxygen Demand	*<32.19*		16	16	mg/Kg-dry	1	5/24/2016 10:30
CHLORIDE			Method: **A4500-CL E-97**		Prep: EXTRACT / 5/18/16		Analyst: **ED**
Chloride	**37**		**1.7**	**16**	**mg/Kg-dry**	1	5/23/2016 20:30
CYANIDE, TOTAL			Method: **SW9012B**		Prep: SW9012B / 5/20/16		Analyst: **JB**
Cyanide, Total	**0.13**	J	**0.017**	**0.79**	**mg/Kg-dry**	1	5/25/2016 10:14

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-2
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-08
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND			Method: **E410.4 R2.0**		Prep: EXTRACT / 5/20/16		Analyst: **JJG**
Chemical Oxygen Demand	**410**	J	**150**	**790**	**mg/Kg-dry**	1	5/20/2016 15:15
MOISTURE			Method: **SW3550C**				Analyst: **EDL**
Moisture	**37**		**0.025**	**0.050**	**% of sample**	1	5/19/2016 16:14
NITROGEN, TOTAL			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total	**750**		**0**	**1.6**	**mg/Kg-dry**	1	5/24/2016 15:40
AMMONIA AS NITROGEN			Method: **A4500-NH3 G-97**		Prep: A4500-NH3 B / 5/23/16		Analyst: **JJG**
Ammonia as Nitrogen	**13**	J	**5.9**	**20**	**mg NH3-N/Kg-dry**	1	5/23/2016 14:37
NITROGEN, NITRITE			Method: **A4500-NO2 B**		Prep: EXTRACT / 5/20/16		Analyst: **LW**
Nitrogen, Nitrite	**0.057**	J	**0.013**	**1.1**	**mg/Kg-dry**	1	5/20/2016 15:15
NITROGEN, NITRATE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate	**0.31**	J	**0.076**	**1.6**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, NITRATE-NITRITE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**0.40**	J	**0.12**	**1.6**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, TOTAL INORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Inorganic	**13**		**0**	**0.032**	**mg/Kg-dry**	1	5/24/2016 15:50
NITROGEN, TOTAL ORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Organic	**740**		**1.6**	**1.6**	**mg/Kg-dry**	1	5/24/2016 15:40
PHOSPHORUS, TOTAL			Method: **E365.1 R2.0**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Total	**340**		**56**	**230**	**mg/Kg-dry**	30	5/20/2016 10:47
PH			Method: **SW9045D**		Prep: EXTRACT / 5/19/16		Analyst: **EDL**
pH	**8.8**		**0**		**s.u.**	1	5/19/2016 18:07
PHOSPHORUS, ORTHO-P (AS P)			Method: **A4500-P E-97**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**1.5**	J	**0.74**	**1.6**	**mg/Kg-dry**	1	5/20/2016 13:29
NITROGEN, TOTAL KJELDAHL			Method: **A4500-NH3 G-97**		Prep: A4500-N B / 5/23/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**740**		**37**	**80**	**mg/Kg-dry**	10	5/24/2016 13:58
ORGANIC CARBON - WALKLEY-BLACK			Method: **TITRAMETRIC**				Analyst: **KF**
Organic Carbon - W-B	**1.1**		**0.019**	**0.040**	**% by wt-dry**	1	5/23/2016 12:10

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-3
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-09
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 5/19/16		Analyst: **EB**
Aroclor 1016	U		15	130	µg/Kg-dry	1	5/21/2016 17:53
Aroclor 1221	U		15	130	µg/Kg-dry	1	5/21/2016 17:53
Aroclor 1232	U		15	130	µg/Kg-dry	1	5/21/2016 17:53
Aroclor 1242	U		15	130	µg/Kg-dry	1	5/21/2016 17:53
Aroclor 1248	U		15	130	µg/Kg-dry	1	5/21/2016 17:53
Aroclor 1254	U		19	130	µg/Kg-dry	1	5/21/2016 17:53
Aroclor 1260	U		19	130	µg/Kg-dry	1	5/21/2016 17:53
Surr: Decachlorobiphenyl	*85.1*			*40-140*	*%REC*	1	5/21/2016 17:53
Surr: Tetrachloro-m-xylene	*74.1*			*45-124*	*%REC*	1	5/21/2016 17:53
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 5/19/16		Analyst: **BLM**
4,4´-DDD	U		4.2	31	µg/Kg-dry	2	5/20/2016 18:47
4,4´-DDE	U		6.5	31	µg/Kg-dry	2	5/20/2016 18:47
4,4´-DDT	U		5.6	31	µg/Kg-dry	2	5/20/2016 18:47
Aldrin	U		4.9	31	µg/Kg-dry	2	5/20/2016 18:47
alpha-BHC	U		3.3	31	µg/Kg-dry	2	5/20/2016 18:47
alpha-Chlordane	U		5.3	31	µg/Kg-dry	2	5/20/2016 18:47
beta-BHC	U		11	31	µg/Kg-dry	2	5/20/2016 18:47
Chlordane, Technical	U		23	78	µg/Kg-dry	2	5/20/2016 18:47
delta-BHC	U		4.9	31	µg/Kg-dry	2	5/20/2016 18:47
Dieldrin	U		6.5	31	µg/Kg-dry	2	5/20/2016 18:47
Endosulfan I	U		4.1	31	µg/Kg-dry	2	5/20/2016 18:47
Endosulfan II	U		7.0	31	µg/Kg-dry	2	5/20/2016 18:47
Endosulfan sulfate	U		5.6	31	µg/Kg-dry	2	5/20/2016 18:47
Endrin	U		5.3	31	µg/Kg-dry	2	5/20/2016 18:47
Endrin aldehyde	U		13	31	µg/Kg-dry	2	5/20/2016 18:47
gamma-BHC (Lindane)	U		4.4	31	µg/Kg-dry	2	5/20/2016 18:47
Heptachlor	U		4.9	31	µg/Kg-dry	2	5/20/2016 18:47
Heptachlor epoxide	U		4.4	31	µg/Kg-dry	2	5/20/2016 18:47
Toxaphene	U		23	190	µg/Kg-dry	2	5/20/2016 18:47
Surr: Decachlorobiphenyl	*72.1*			*45-135*	*%REC*	2	5/20/2016 18:47
Surr: Tetrachloro-m-xylene	*70.1*			*45-124*	*%REC*	2	5/20/2016 18:47
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 5/20/16		Analyst: **LR**
Mercury	**0.027**		**0.0035**	**0.021**	**mg/Kg-dry**	1	5/23/2016 22:55
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Magnesium	**20,000**		**5.7**	**240**	**mg/Kg-dry**	10	5/22/2016 00:17
Potassium	**1,700**		**9.3**	**240**	**mg/Kg-dry**	10	5/22/2016 00:17
Sodium	**180**	J	**49**	**240**	**mg/Kg-dry**	10	5/22/2016 00:17

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-3
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-09
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/20/16		Analyst: **ML**
Antimony	**0.39**	J	**0.073**	**6.1**	**mg/Kg-dry**	10	5/21/2016 05:14
Arsenic	**11**		**0.96**	**6.1**	**mg/Kg-dry**	10	5/21/2016 05:14
Beryllium	**0.54**	J	**0.098**	**2.4**	**mg/Kg-dry**	10	5/21/2016 05:14
Cadmium	**0.28**	J	**0.098**	**2.4**	**mg/Kg-dry**	10	5/21/2016 05:14
Chromium	**17**		**0.98**	**6.1**	**mg/Kg-dry**	10	5/21/2016 05:14
Copper	**23**		**0.32**	**6.1**	**mg/Kg-dry**	10	5/21/2016 05:14
Lead	**12**		**0.15**	**6.1**	**mg/Kg-dry**	10	5/21/2016 05:14
Nickel	**28**		**1.1**	**6.1**	**mg/Kg-dry**	10	5/21/2016 05:14
Selenium	**2.9**	J	**0.96**	**6.1**	**mg/Kg-dry**	10	5/21/2016 05:14
Silver	U		0.17	6.1	mg/Kg-dry	10	5/21/2016 05:14
Thallium	**0.37**	J	**0.17**	**6.1**	**mg/Kg-dry**	10	5/21/2016 05:14
Zinc	**65**		**2.4**	**12**	**mg/Kg-dry**	10	5/21/2016 05:14
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 5/23/16		Analyst: **RS**
1,2-Diphenylhydrazine	U		6.6	78	µg/Kg-dry	1	5/24/2016 12:16
2,4,6-Trichlorophenol	U		15	78	µg/Kg-dry	1	5/24/2016 12:16
2,4-Dichlorophenol	U		16	78	µg/Kg-dry	1	5/24/2016 12:16
2,4-Dimethylphenol	U		19	78	µg/Kg-dry	1	5/24/2016 12:16
2,4-Dinitrophenol	U		24	78	µg/Kg-dry	1	5/24/2016 12:16
2,4-Dinitrotoluene	U		12	78	µg/Kg-dry	1	5/24/2016 12:16
2,6-Dinitrotoluene	U		17	78	µg/Kg-dry	1	5/24/2016 12:16
2-Chloronaphthalene	U		4.3	16	µg/Kg-dry	1	5/24/2016 12:16
2-Chlorophenol	U		14	78	µg/Kg-dry	1	5/24/2016 12:16
2-Nitrophenol	U		21	78	µg/Kg-dry	1	5/24/2016 12:16
3,3´-Dichlorobenzidine	U		100	400	µg/Kg-dry	1	5/24/2016 12:16
4,6-Dinitro-2-methylphenol	U		11	78	µg/Kg-dry	1	5/24/2016 12:16
4-Bromophenyl phenyl ether	U		12	78	µg/Kg-dry	1	5/24/2016 12:16
4-Chloro-3-methylphenol	U		12	78	µg/Kg-dry	1	5/24/2016 12:16
4-Chlorophenyl phenyl ether	U		14	78	µg/Kg-dry	1	5/24/2016 12:16
4-Nitrophenol	U		12	78	µg/Kg-dry	1	5/24/2016 12:16
Acenaphthene	U		5.9	16	µg/Kg-dry	1	5/24/2016 12:16
Acenaphthylene	**6.3**	J	**4.9**	**16**	**µg/Kg-dry**	1	5/24/2016 12:16
Anthracene	**13**	J	**7.6**	**16**	**µg/Kg-dry**	1	5/24/2016 12:16
Benzidine	U		81	400	µg/Kg-dry	1	5/24/2016 12:16
Benzo(a)anthracene	**58**		**9.6**	**16**	**µg/Kg-dry**	1	5/24/2016 12:16
Benzo(a)pyrene	**33**		**3.3**	**16**	**µg/Kg-dry**	1	5/24/2016 12:16
Benzo(b)fluoranthene	**43**		**5.4**	**16**	**µg/Kg-dry**	1	5/24/2016 12:16
Benzo(g,h,i)perylene	**31**		**6.9**	**16**	**µg/Kg-dry**	1	5/24/2016 12:16
Benzo(k)fluoranthene	**17**		**9.9**	**16**	**µg/Kg-dry**	1	5/24/2016 12:16

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-3
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-09
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		7.9	78	µg/Kg-dry	1	5/24/2016 12:16
Bis(2-chloroethyl)ether	U		8.8	78	µg/Kg-dry	1	5/24/2016 12:16
Bis(2-chloroisopropyl)ether	U		40	78	µg/Kg-dry	1	5/24/2016 12:16
Bis(2-ethylhexyl)phthalate	U		25	78	µg/Kg-dry	1	5/24/2016 12:16
Butyl benzyl phthalate	U		22	78	µg/Kg-dry	1	5/24/2016 12:16
Chrysene	**40**		**13**	**16**	**µg/Kg-dry**	1	5/24/2016 12:16
Dibenzo(a,h)anthracene	U		5.1	16	µg/Kg-dry	1	5/24/2016 12:16
Diethyl phthalate	**45**	J	**10**	**78**	**µg/Kg-dry**	1	5/24/2016 12:16
Dimethyl phthalate	**28**	J	**7.8**	**78**	**µg/Kg-dry**	1	5/24/2016 12:16
Di-n-butyl phthalate	U		21	78	µg/Kg-dry	1	5/24/2016 12:16
Di-n-octyl phthalate	U		21	78	µg/Kg-dry	1	5/24/2016 12:16
Fluoranthene	**63**		**9.7**	**16**	**µg/Kg-dry**	1	5/24/2016 12:16
Fluorene	**13**	J	**8.8**	**16**	**µg/Kg-dry**	1	5/24/2016 12:16
Hexachlorobenzene	U		13	78	µg/Kg-dry	1	5/24/2016 12:16
Hexachlorobutadiene	U		14	78	µg/Kg-dry	1	5/24/2016 12:16
Hexachlorocyclopentadiene	U		19	78	µg/Kg-dry	1	5/24/2016 12:16
Hexachloroethane	U		33	78	µg/Kg-dry	1	5/24/2016 12:16
Indeno(1,2,3-cd)pyrene	**28**		**9.9**	**16**	**µg/Kg-dry**	1	5/24/2016 12:16
Isophorone	U		14	400	µg/Kg-dry	1	5/24/2016 12:16
Naphthalene	**33**		**4.1**	**16**	**µg/Kg-dry**	1	5/24/2016 12:16
Nitrobenzene	U		17	400	µg/Kg-dry	1	5/24/2016 12:16
N-Nitrosodimethylamine	U		71	400	µg/Kg-dry	1	5/24/2016 12:16
N-Nitrosodi-n-propylamine	U		16	78	µg/Kg-dry	1	5/24/2016 12:16
N-Nitrosodiphenylamine	U		12	78	µg/Kg-dry	1	5/24/2016 12:16
Pentachlorophenol	U		27	78	µg/Kg-dry	1	5/24/2016 12:16
Phenanthrene	**43**		**8.8**	**16**	**µg/Kg-dry**	1	5/24/2016 12:16
Phenol	U		16	78	µg/Kg-dry	1	5/24/2016 12:16
Pyrene	**71**		**12**	**16**	**µg/Kg-dry**	1	5/24/2016 12:16
Surr: 2,4,6-Tribromophenol	*39.5*			*34-140*	*%REC*	1	5/24/2016 12:16
Surr: 2-Fluorobiphenyl	*69.1*			*12-100*	*%REC*	1	5/24/2016 12:16
Surr: 2-Fluorophenol	*70.4*			*33-117*	*%REC*	1	5/24/2016 12:16
Surr: 4-Terphenyl-d14	*99.6*			*25-137*	*%REC*	1	5/24/2016 12:16
Surr: Nitrobenzene-d5	*67.8*			*37-107*	*%REC*	1	5/24/2016 12:16
Surr: Phenol-d6	*70.6*			*40-106*	*%REC*	1	5/24/2016 12:16
VOLATILE ORGANICS - METHANOL CORRECTED		Method: **SW8260A**			Prep: SW5030A / 5/20/16		Analyst: **BG**
1,1,1-Trichloroethane	U		19	65	µg/Kg-dry	1	5/20/2016 19:28
1,1,2,2-Tetrachloroethane	U		16	65	µg/Kg-dry	1	5/20/2016 19:28
1,1,2-Trichloroethane	U		20	65	µg/Kg-dry	1	5/20/2016 19:28
1,1-Dichloroethane	U		17	65	µg/Kg-dry	1	5/20/2016 19:28

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-3
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-09
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		18	65	µg/Kg-dry	1	5/20/2016 19:28
1,2-Dichlorobenzene	U		19	65	µg/Kg-dry	1	5/20/2016 19:28
1,2-Dichloroethane	U		18	65	µg/Kg-dry	1	5/20/2016 19:28
1,2-Dichloropropane	U		18	65	µg/Kg-dry	1	5/20/2016 19:28
1,3-Dichlorobenzene	U		21	65	µg/Kg-dry	1	5/20/2016 19:28
1,4-Dichlorobenzene	U		17	65	µg/Kg-dry	1	5/20/2016 19:28
Acrolein	U		200	430	µg/Kg-dry	1	5/20/2016 19:28
Acrylonitrile	U		55	220	µg/Kg-dry	1	5/20/2016 19:28
Benzene	U		15	65	µg/Kg-dry	1	5/20/2016 19:28
Bromodichloromethane	U		17	65	µg/Kg-dry	1	5/20/2016 19:28
Bromoform	U		23	65	µg/Kg-dry	1	5/20/2016 19:28
Bromomethane	U		28	160	µg/Kg-dry	1	5/20/2016 19:28
Carbon tetrachloride	U		12	65	µg/Kg-dry	1	5/20/2016 19:28
Chlorobenzene	U		20	65	µg/Kg-dry	1	5/20/2016 19:28
Chloroethane	U		42	220	µg/Kg-dry	1	5/20/2016 19:28
Chloroform	U		22	65	µg/Kg-dry	1	5/20/2016 19:28
Chloromethane	U		26	220	µg/Kg-dry	1	5/20/2016 19:28
cis-1,2-Dichloroethene	U		18	65	µg/Kg-dry	1	5/20/2016 19:28
cis-1,3-Dichloropropene	U		25	65	µg/Kg-dry	1	5/20/2016 19:28
Dibromochloromethane	U		15	65	µg/Kg-dry	1	5/20/2016 19:28
Ethylbenzene	U		15	65	µg/Kg-dry	1	5/20/2016 19:28
Methylene chloride	U		30	65	µg/Kg-dry	1	5/20/2016 19:28
Tetrachloroethene	U		32	65	µg/Kg-dry	1	5/20/2016 19:28
Toluene	**24**	J	**22**	**65**	**µg/Kg-dry**	1	5/20/2016 19:28
trans-1,2-Dichloroethene	U		18	65	µg/Kg-dry	1	5/20/2016 19:28
trans-1,3-Dichloropropene	U		12	65	µg/Kg-dry	1	5/20/2016 19:28
Trichloroethene	U		17	65	µg/Kg-dry	1	5/20/2016 19:28
Vinyl chloride	U		21	65	µg/Kg-dry	1	5/20/2016 19:28
Surr: 1,2-Dichloroethane-d4	*99.0*			*70-120*	*%REC*	1	5/20/2016 19:28
Surr: 4-Bromofluorobenzene	*95.4*			*75-120*	*%REC*	1	5/20/2016 19:28
Surr: Dibromofluoromethane	*98.2*			*85-115*	*%REC*	1	5/20/2016 19:28
Surr: Toluene-d8	*97.7*			*85-120*	*%REC*	1	5/20/2016 19:28
BIOCHEMICAL OXYGEN DEMAND		Method:	**A5210B-97**		Prep: A5210B / 5/19/16		Analyst: **JRF**
Biochemical Oxygen Demand	*<32.25*		16	16	mg/Kg-dry	1	5/24/2016 10:30
CHLORIDE		Method:	**A4500-CL E-97**		Prep: EXTRACT / 5/18/16		Analyst: **ED**
Chloride	**44**		**1.7**	**16**	**mg/Kg-dry**	1	5/23/2016 20:30
CYANIDE, TOTAL		Method:	**SW9012B**		Prep: SW9012B / 5/20/16		Analyst: **JB**
Cyanide, Total	**0.092**	J	**0.018**	**0.81**	**mg/Kg-dry**	1	5/25/2016 10:14

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *26-May-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-3
Collection Date: 5/16/2016 01:30 PM

Work Order: 1605959
Lab ID: 1605959-09
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND			Method: **E410.4 R2.0**		Prep: EXTRACT / 5/20/16		Analyst: **JJG**
Chemical Oxygen Demand	**400**	J	**140**	**780**	**mg/Kg-dry**	1	5/20/2016 15:15
MOISTURE			Method: **SW3550C**				Analyst: **EDL**
Moisture	**37**		**0.025**	**0.050**	**% of sample**	1	5/19/2016 16:14
NITROGEN, TOTAL			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total	**790**		**0**	**1.6**	**mg/Kg-dry**	1	5/24/2016 15:40
AMMONIA AS NITROGEN			Method: **A4500-NH3 G-97**		Prep: A4500-NH3 B / 5/23/16		Analyst: **JJG**
Ammonia as Nitrogen	**9.5**	J	**5.6**	**19**	**mg NH3-N/Kg-dry**	1	5/23/2016 14:37
NITROGEN, NITRITE			Method: **A4500-NO2 B**		Prep: EXTRACT / 5/20/16		Analyst: **LW**
Nitrogen, Nitrite	U		0.013	1.1	mg/Kg-dry	1	5/20/2016 15:15
NITROGEN, NITRATE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate	**0.45**	J	**0.076**	**1.5**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, NITRATE-NITRITE			Method: **E353.2**		Prep: EXTRACT / 5/19/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**0.51**	J	**0.12**	**1.5**	**mg/Kg-dry**	1	5/24/2016 11:35
NITROGEN, TOTAL INORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Inorganic	**10**		**0**	**0.032**	**mg/Kg-dry**	1	5/24/2016 15:50
NITROGEN, TOTAL ORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Organic	**780**		**1.6**	**1.6**	**mg/Kg-dry**	1	5/24/2016 15:40
PHOSPHORUS, TOTAL			Method: **E365.1 R2.0**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Total	**320**		**58**	**240**	**mg/Kg-dry**	30	5/20/2016 10:47
PH			Method: **SW9045D**		Prep: EXTRACT / 5/19/16		Analyst: **EDL**
pH	**8.8**		**0**		**s.u.**	1	5/19/2016 18:07
PHOSPHORUS, ORTHO-P (AS P)			Method: **A4500-P E-97**		Prep: E365.1 R2.0 / 5/19/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**2.0**		**0.74**	**1.6**	**mg/Kg-dry**	1	5/20/2016 13:29
NITROGEN, TOTAL KJELDAHL			Method: **A4500-NH3 G-97**		Prep: A4500-N B / 5/23/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**800**		**37**	**80**	**mg/Kg-dry**	10	5/24/2016 13:58
ORGANIC CARBON - WALKLEY-BLACK			Method: **TITRAMETRIC**				Analyst: **KF**
Organic Carbon - W-B	**1.1**		**0.019**	**0.040**	**% by wt-dry**	1	5/23/2016 12:10

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 26-May-16

Client: Hull & Associates, Inc.

Work Order: 1605959

Project: RCK001

QC BATCH REPORT

Batch ID: **86268** Instrument ID **GC14** Method: **SW8082**

MBLK Sample ID: **PBLKS1-86268-86268** Units: **µg/Kg** Analysis Date: **5/20/2016 09:18 AM**

Client ID: Run ID: **GC14_160520B** SeqNo: **3842443** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	U	83								
Aroclor 1221	U	83								
Aroclor 1232	U	83								
Aroclor 1242	U	83								
Aroclor 1248	U	83								
Aroclor 1254	U	83								
Aroclor 1260	U	83								
Surr: Decachlorobiphenyl	*33*	0	*33.3*	0	*99.1*	*40-140*	0			
Surr: Tetrachloro-m-xylene	*29.67*	0	*33.3*	0	*89.1*	*45-124*	0			

LCS Sample ID: **PLCSS1-86268-86268** Units: **µg/Kg** Analysis Date: **5/20/2016 09:35 AM**

Client ID: Run ID: **GC14_160520B** SeqNo: **3842444** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	863.7	83	833	0	104	50-130	0			
Aroclor 1260	888	83	833	0	107	50-130	0			
Surr: Decachlorobiphenyl	*34*	0	*33.3*	0	*102*	*40-140*	0			
Surr: Tetrachloro-m-xylene	*29.33*	0	*33.3*	0	*88.1*	*45-124*	0			

MS Sample ID: **1605989-01A MS** Units: **µg/Kg** Analysis Date: **5/20/2016 10:11 AM**

Client ID: Run ID: **GC14_160520B** SeqNo: **3842446** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	934.5	82	820.3	0	114	40-140	0			
Aroclor 1260	2222	82	820.3	0	271	40-140	0			S
Surr: Decachlorobiphenyl	*31.84*	0	*32.79*	0	*97.1*	*40-140*	0			
Surr: Tetrachloro-m-xylene	*27.57*	0	*32.79*	0	*84.1*	*45-124*	0			

MSD Sample ID: **1605989-01A MSD** Units: **µg/Kg** Analysis Date: **5/20/2016 10:28 AM**

Client ID: Run ID: **GC14_160520B** SeqNo: **3842447** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	1016	83	830.2	0	122	40-140	934.5	8.38	50	
Aroclor 1260	4120	83	830.2	0	496	40-140	2222	59.8	50	SRE
Surr: Decachlorobiphenyl	*34.22*	0	*33.19*	0	*103*	*40-140*	31.84	*7.2*		
Surr: Tetrachloro-m-xylene	*30.9*	0	*33.19*	0	*93.1*	*45-124*	27.57	*11.4*		

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86269** Instrument ID **GC12** Method: **SW8081A**

MBLK Sample ID: **PBLKS1-86269-86269** Units: **µg/Kg** Analysis Date: **5/20/2016 02:21 PM**
Client ID: Run ID: **GC12_160520A** SeqNo: **3839080** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	U	10								
4,4´-DDE	U	10								
4,4´-DDT	U	10								
Aldrin	U	10								
alpha-BHC	U	10								
alpha-Chlordane	U	10								
beta-BHC	U	10								
Chlordane, Technical	U	25								
delta-BHC	U	10								
Dieldrin	U	10								
Endosulfan I	U	10								
Endosulfan II	U	10								
Endosulfan sulfate	U	10								
Endrin	U	10								
Endrin aldehyde	U	10								
gamma-BHC (Lindane)	U	10								
Heptachlor	U	10								
Heptachlor epoxide	U	10								
Toxaphene	U	60								
Surr: Decachlorobiphenyl	*33*	0	*33.3*	0	*99.1*	*45-135*	0			
Surr: Tetrachloro-m-xylene	*30.33*	0	*33.3*	0	*91.1*	*45-124*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86269** Instrument ID **GC12** Method: **SW8081A**

LCS Sample ID: **PLCSS1-86269-86269** Units: **µg/Kg** Analysis Date: **5/20/2016 02:37 PM**
Client ID: Run ID: **GC12_160520A** SeqNo: **3839081** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	28.67	10	33.33	0	86	30-135	0			
4,4´-DDE	31.67	10	33.33	0	95	70-125	0			
4,4´-DDT	58	10	33.33	0	174	45-140	0			S
Aldrin	27	10	33.33	0	81	45-140	0			
alpha-BHC	28.33	10	33.33	0	85	60-125	0			
alpha-Chlordane	28	10	33.33	0	84	50-150	0			
beta-BHC	28.33	10	33.33	0	85	60-125	0			
delta-BHC	29	10	33.33	0	87	55-130	0			
Dieldrin	45	10	33.33	0	135	65-125	0			S
Endosulfan I	30.33	10	33.33	0	91	15-135	0			
Endosulfan II	32.67	10	33.33	0	98	35-140	0			
Endosulfan sulfate	34	10	33.33	0	102	60-135	0			
Endrin	36.67	10	33.33	0	110	60-135	0			
Endrin aldehyde	43.33	10	33.33	0	130	35-145	0			
gamma-BHC (Lindane)	27.67	10	33.33	0	83	60-125	0			
Heptachlor	30	10	33.33	0	90	50-140	0			
Heptachlor epoxide	35.33	10	33.33	0	106	65-130	0			
Surr: Decachlorobiphenyl	*31.33*	0	*33.3*	0	*94.1*	*45-135*	0			
Surr: Tetrachloro-m-xylene	*31.33*	0	*33.3*	0	*94.1*	*45-124*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86269** Instrument ID **GC12** Method: **SW8081A**

MS Sample ID: **1605959-01B MS** Units: **µg/Kg** Analysis Date: **5/20/2016 03:55 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **GC12_160520A** SeqNo: **3841549** Prep Date: **5/19/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	24.01	19	31.59	0	76	30-135	0			
4,4´-DDE	24.64	19	31.59	0	78	70-125	0			
4,4´-DDT	23.38	19	31.59	0	74	45-140	0			
Aldrin	20.22	19	31.59	0	64	45-140	0			
alpha-BHC	24.01	19	31.59	0	76	60-125	0			
alpha-Chlordane	22.75	19	31.59	0	72	50-150	0			
beta-BHC	24.01	19	31.59	0	76	60-125	0			
delta-BHC	27.8	19	31.59	0	88	55-130	0			
Dieldrin	24.64	19	31.59	0	78	65-125	0			
Endosulfan I	24.64	19	31.59	0	78	15-135	0			
Endosulfan II	24.64	19	31.59	0	78	35-140	0			
Endosulfan sulfate	25.28	19	31.59	0	80	60-135	0			
Endrin	32.23	19	31.59	0	102	60-135	0			
Endrin aldehyde	22.12	19	31.59	0	70	35-145	0			
gamma-BHC (Lindane)	24.64	19	31.59	0	78	60-125	0			
Heptachlor	15.8	19	31.59	0	50	50-140	0			J
Heptachlor epoxide	24.64	19	31.59	0	78	65-130	0			
Surr: Decachlorobiphenyl	*23.38*	0	*31.56*	0	*74.1*	*45-135*	0			
Surr: Tetrachloro-m-xylene	*23.38*	0	*31.56*	0	*74.1*	*45-124*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86269** Instrument ID **GC12** Method: **SW8081A**

MSD Sample ID: **1605959-01B MSD** Units: **µg/Kg** Analysis Date: **5/20/2016 04:11 PM**

Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **GC12_160520A** SeqNo: **3841550** Prep Date: **5/19/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	25.65	20	32.88	0	78	30-135	24.01	6.59	35	
4,4´-DDE	26.96	20	32.88	0	82	70-125	24.64	8.99	35	
4,4´-DDT	25.65	20	32.88	0	78	45-140	23.38	9.25	35	
Aldrin	21.7	20	32.88	0	66	45-140	20.22	7.06	35	
alpha-BHC	24.99	20	32.88	0	76	60-125	24.01	3.99	35	
alpha-Chlordane	24.99	20	32.88	0	76	50-150	22.75	9.39	35	
beta-BHC	26.31	20	32.88	0	80	60-125	24.01	9.11	35	
delta-BHC	31.57	20	32.88	0	96	55-130	27.8	12.7	35	
Dieldrin	26.31	20	32.88	0	80	65-125	24.64	6.52	35	
Endosulfan I	26.96	20	32.88	0	82	15-135	24.64	8.99	35	
Endosulfan II	26.31	20	32.88	0	80	35-140	24.64	6.52	35	
Endosulfan sulfate	26.96	20	32.88	0	82	60-135	25.28	6.46	35	
Endrin	34.2	20	32.88	0	104	60-135	32.23	5.93	35	
Endrin aldehyde	23.02	20	32.88	0	70	35-145	22.12	3.99	35	
gamma-BHC (Lindane)	26.31	20	32.88	0	80	60-125	24.64	6.52	35	
Heptachlor	18.41	20	32.88	0	56	50-140	15.8	0	35	J
Heptachlor epoxide	26.31	20	32.88	0	80	65-130	24.64	6.52	35	
Surr: Decachlorobiphenyl	*26.96*	0	*32.85*	0	*82.1*	*45-135*	23.38	*14.2*	*35*	
Surr: Tetrachloro-m-xylene	*26.31*	0	*32.85*	0	*80.1*	*45-124*	23.38	*11.8*	*35*	

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86361** Instrument ID **HG1** Method: **SW7471A**

MBLK Sample ID: **MBLK-86361-86361** Units: **mg/Kg** Analysis Date: **5/23/2016 10:22 PM**
Client ID: Run ID: **HG1_160523A** SeqNo: **3843138** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.020								

LCS Sample ID: **LCS-86361-86361** Units: **mg/Kg** Analysis Date: **5/23/2016 10:24 PM**
Client ID: Run ID: **HG1_160523A** SeqNo: **3843139** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1708	0.020	0.1665	0	103	80-120	0			

MS Sample ID: **1605959-05BMS** Units: **mg/Kg** Analysis Date: **5/23/2016 10:44 PM**
Client ID: **RCK001:50/50:SB16-1160-3** Run ID: **HG1_160523A** SeqNo: **3843148** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1267	0.013	0.1115	0.01722	98.2	75-125	0			

MSD Sample ID: **1605959-05BMSD** Units: **mg/Kg** Analysis Date: **5/23/2016 10:46 PM**
Client ID: **RCK001:50/50:SB16-1160-3** Run ID: **HG1_160523A** SeqNo: **3843149** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1309	0.013	0.1117	0.01722	102	75-125	0.1267	3.26	35	

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86340** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-86340-86340** Units: **mg/Kg** Analysis Date: **5/21/2016 03:21 AM**
Client ID: Run ID: **ICPMS1_160520A** SeqNo: **3839768** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.50								
Arsenic	U	0.50								
Beryllium	U	0.50								
Cadmium	U	0.50								
Chromium	U	0.50								
Copper	U	0.50								
Lead	U	0.50								
Nickel	U	0.50								
Selenium	U	0.50								
Silver	U	0.50								
Thallium	U	0.50								
Zinc	U	0.50								

LCS Sample ID: **LCS-86340-86340** Units: **mg/Kg** Analysis Date: **5/21/2016 03:27 AM**
Client ID: Run ID: **ICPMS1_160520A** SeqNo: **3839769** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	4.876	0.50	5	0	97.5	80-120	0			
Arsenic	4.755	0.50	5	0	95.1	80-120	0			
Beryllium	4.514	0.50	5	0	90.3	80-120	0			
Cadmium	4.632	0.50	5	0	92.6	80-120	0			
Chromium	5.17	0.50	5	0	103	80-120	0			
Copper	5.015	0.50	5	0	100	80-120	0			
Lead	4.878	0.50	5	0	97.6	80-120	0			
Nickel	5.165	0.50	5	0	103	80-120	0			
Selenium	5.035	0.50	5	0	101	80-120	0			
Silver	4.87	0.50	5	0	97.4	80-120	0			
Thallium	4.746	0.50	5	0	94.9	80-120	0			
Zinc	4.678	0.50	5	0	93.6	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **86340** Instrument ID **ICPMS1** Method: **SW6020A**

MS Sample ID: **1605959-07BMS** Units: **mg/Kg** Analysis Date: **5/21/2016 04:36 AM**
Client ID: **RCK001:66/33:SB16-1161-3** Run ID: **ICPMS1_160520A** SeqNo: **3839780** Prep Date: **5/20/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	5.998	6.5	6.477	0.301	88	75-125	0			J
Arsenic	16.87	6.5	6.477	8.035	136	75-125	0			S
Cadmium	6.755	6.5	6.477	0.2427	101	75-125	0			
Chromium	23.44	6.5	6.477	17	99.4	75-125	0			
Copper	25.84	6.5	6.477	21.34	69.6	75-125	0			S
Lead	15.84	6.5	6.477	9.89	91.9	75-125	0			
Nickel	33.4	6.5	6.477	29.47	60.7	75-125	0			SO
Selenium	8.284	6.5	6.477	1.717	101	75-125	0			
Silver	6.452	6.5	6.477	0.07062	98.5	75-125	0			J
Thallium	6.412	6.5	6.477	0.3562	93.5	75-125	0			J
Zinc	60.19	6.5	6.477	61.41	-18.9	75-125	0			SO

MS Sample ID: **1605959-07BMS** Units: **mg/Kg** Analysis Date: **5/21/2016 11:59 PM**
Client ID: **RCK001:66/33:SB16-1161-3** Run ID: **ICPMS1_160521A** SeqNo: **3840942** Prep Date: **5/20/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.762	6.5	6.477	0.4986	96.7	75-125	0			

MSD Sample ID: **1605959-07BMSD** Units: **mg/Kg** Analysis Date: **5/21/2016 04:42 AM**
Client ID: **RCK001:66/33:SB16-1161-3** Run ID: **ICPMS1_160520A** SeqNo: **3839781** Prep Date: **5/20/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	5.833	6.4	6.443	0.301	85.9	75-125	5.998	0	25	J
Arsenic	14.18	6.4	6.443	8.035	95.3	75-125	16.87	17.3	25	
Cadmium	6.939	6.4	6.443	0.2427	104	75-125	6.755	2.69	25	
Chromium	24.88	6.4	6.443	17	122	75-125	23.44	5.95	25	
Copper	27.63	6.4	6.443	21.34	97.7	75-125	25.84	6.68	25	
Lead	16.69	6.4	6.443	9.89	106	75-125	15.84	5.2	25	
Nickel	31.62	6.4	6.443	29.47	33.5	75-125	33.4	5.46	25	SO
Selenium	8.267	6.4	6.443	1.717	102	75-125	8.284	0.205	25	
Silver	6.338	6.4	6.443	0.07062	97.3	75-125	6.452	0	25	J
Thallium	6.656	6.4	6.443	0.3562	97.8	75-125	6.412	3.73	25	
Zinc	64.04	6.4	6.443	61.41	40.8	75-125	60.19	6.2	25	SO

MSD Sample ID: **1605959-07BMSD** Units: **mg/Kg** Analysis Date: **5/22/2016 12:05 AM**
Client ID: **RCK001:66/33:SB16-1161-3** Run ID: **ICPMS1_160521A** SeqNo: **3840943** Prep Date: **5/20/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Beryllium	6.443	6.4	6.443	0.4986	92.3	75-125	6.762	4.83	25	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86340** Instrument ID **ICPMS1** Method: **SW6020A**

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86343** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-86340-86343** Units: **mg/Kg** Analysis Date: **5/21/2016 10:46 PM**
Client ID: Run ID: **ICPMS1_160521A** SeqNo: **3841457** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	0.248	10								J
Potassium	U	10								
Sodium	U	10								

LCS Sample ID: **LCS-86340-86343** Units: **mg/Kg** Analysis Date: **5/21/2016 10:52 PM**
Client ID: Run ID: **ICPMS1_160521A** SeqNo: **3841458** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	524	10	500	0	105	80-120	0			
Potassium	514.5	10	500	0	103	80-120	0			
Sodium	516.5	10	500	0	103	80-120	0			

MS Sample ID: **1605959-07BMS** Units: **mg/Kg** Analysis Date: **5/21/2016 11:59 PM**
Client ID: **RCK001:66/33:SB16-1161-3** Run ID: **ICPMS1_160521A** SeqNo: **3841466** Prep Date: **5/20/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	14070	130	647.7	12170	294	75-125	0			SO
Potassium	2635	130	647.7	1411	189	75-125	0			S
Sodium	762.3	130	647.7	108.3	101	75-125	0			

MSD Sample ID: **1605959-07BMSD** Units: **mg/Kg** Analysis Date: **5/22/2016 12:05 AM**
Client ID: **RCK001:66/33:SB16-1161-3** Run ID: **ICPMS1_160521A** SeqNo: **3841467** Prep Date: **5/20/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	12290	130	644.3	12170	19.8	75-125	14070	13.5	25	SO
Potassium	2448	130	644.3	1411	161	75-125	2635	7.38	25	S
Sodium	724.2	130	644.3	108.3	95.6	75-125	762.3	5.12	25	

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **86393** Instrument ID **SVMS5** Method: **SW8270C**

MBLK Sample ID: **SBLKS1-86393-86393** Units: **µg/Kg** Analysis Date: **5/23/2016 04:59 PM**
Client ID: Run ID: **SVMS5_160523A** SeqNo: **3844188** Prep Date: **5/23/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	33								
2,4,6-Trichlorophenol	U	33								
2,4-Dichlorophenol	U	33								
2,4-Dimethylphenol	U	33								
2,4-Dinitrophenol	U	33								
2,4-Dinitrotoluene	U	33								
2,6-Dinitrotoluene	U	33								
2-Chloronaphthalene	U	6.7								
2-Chlorophenol	U	33								
2-Nitrophenol	U	33								
3,3´-Dichlorobenzidine	U	170								
4,6-Dinitro-2-methylphenol	U	33								
4-Bromophenyl phenyl ether	U	33								
4-Chloro-3-methylphenol	U	33								
4-Chlorophenyl phenyl ether	U	33								
4-Nitrophenol	U	33								
Acenaphthene	U	6.7								
Acenaphthylene	U	6.7								
Anthracene	U	6.7								
Benzidine	U	670								
Benzo(a)anthracene	U	6.7								
Benzo(a)pyrene	U	6.7								
Benzo(b)fluoranthene	U	6.7								
Benzo(g,h,i)perylene	U	6.7								
Benzo(k)fluoranthene	U	6.7								
Bis(2-chloroethoxy)methane	U	33								
Bis(2-chloroethyl)ether	U	33								
Bis(2-chloroisopropyl)ether	U	33								
Bis(2-ethylhexyl)phthalate	U	33								
Butyl benzyl phthalate	U	33								
Chrysene	U	6.7								
Dibenzo(a,h)anthracene	U	6.7								
Diethyl phthalate	U	33								
Dimethyl phthalate	U	33								
Di-n-butyl phthalate	U	33								
Di-n-octyl phthalate	U	33								
Fluoranthene	U	6.7								
Fluorene	U	6.7								
Hexachlorobenzene	U	33								
Hexachlorobutadiene	U	33								
Hexachlorocyclopentadiene	U	33								
Hexachloroethane	U	33								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **86393** Instrument ID **SVMS5** Method: **SW8270C**

Indeno(1,2,3-cd)pyrene	U	6.7					
Isophorone	U	170					
Naphthalene	U	6.7					
Nitrobenzene	U	170					
N-Nitrosodimethylamine	U	170					
N-Nitrosodi-n-propylamine	U	33					
N-Nitrosodiphenylamine	U	33					
Pentachlorophenol	U	33					
Phenanthrene	U	6.7					
Phenol	U	33					
Pyrene	U	6.7					
Surr: 2,4,6-Tribromophenol	*1317*	0	*1667*	0	*79*	*34-140*	0
Surr: 2-Fluorobiphenyl	*1292*	0	*1667*	0	*77.5*	*12-100*	0
Surr: 2-Fluorophenol	*1695*	0	*1667*	0	*102*	*33-117*	0
Surr: 4-Terphenyl-d14	*1734*	0	*1667*	0	*104*	*25-137*	0
Surr: Nitrobenzene-d5	*1212*	0	*1667*	0	*72.7*	*37-107*	0
Surr: Phenol-d6	*1514*	0	*1667*	0	*90.8*	*40-106*	0

QC BATCH REPORT

Batch ID: **86393** Instrument ID **SVMS5** Method: **SW8270C**

LCS Sample ID: **SLCSS1-86393-86393** Units: **µg/Kg** Analysis Date: **5/24/2016 03:22 PM**
Client ID: Run ID: **SVMS5_160524A** SeqNo: **3846197** Prep Date: **5/23/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	645	33	666.7	0	96.7	55-115	0			
2,4,6-Trichlorophenol	540	33	666.7	0	81	45-110	0			
2,4-Dichlorophenol	661.3	33	666.7	0	99.2	45-110	0			
2,4-Dimethylphenol	613.3	33	666.7	0	92	30-105	0			
2,4-Dinitrophenol	409.7	33	666.7	0	61.4	15-130	0			
2,4-Dinitrotoluene	548.3	33	666.7	0	82.2	50-115	0			
2,6-Dinitrotoluene	548.3	33	666.7	0	82.2	50-110	0			
2-Chloronaphthalene	541	6.7	666.7	0	81.1	45-105	0			
2-Chlorophenol	638.7	33	666.7	0	95.8	45-105	0			
2-Nitrophenol	598	33	666.7	0	89.7	40-110	0			
3,3´-Dichlorobenzidine	579.7	170	666.7	0	86.9	30-120	0			
4,6-Dinitro-2-methylphenol	542	33	666.7	0	81.3	40-130	0			
4-Bromophenyl phenyl ether	615	33	666.7	0	92.2	45-115	0			
4-Chloro-3-methylphenol	679.7	33	666.7	0	102	45-115	0			
4-Chlorophenyl phenyl ether	572	33	666.7	0	85.8	45-110	0			
4-Nitrophenol	478.7	33	666.7	0	71.8	15-140	0			
Acenaphthene	531.3	6.7	666.7	0	79.7	45-110	0			
Acenaphthylene	569.7	6.7	666.7	0	85.4	45-105	0			
Anthracene	665.7	6.7	666.7	0	99.8	55-105	0			
Benzo(a)anthracene	670.7	6.7	666.7	0	101	50-110	0			
Benzo(a)pyrene	699.3	6.7	666.7	0	105	50-110	0			
Benzo(b)fluoranthene	693	6.7	666.7	0	104	45-115	0			
Benzo(g,h,i)perylene	621.7	6.7	666.7	0	93.2	40-125	0			
Benzo(k)fluoranthene	709.3	6.7	666.7	0	106	45-115	0			
Bis(2-chloroethoxy)methane	601.7	33	666.7	0	90.2	45-110	0			
Bis(2-chloroethyl)ether	538	33	666.7	0	80.7	40-105	0			
Bis(2-chloroisopropyl)ether	580	33	666.7	0	87	20-115	0			
Bis(2-ethylhexyl)phthalate	628.7	33	666.7	0	94.3	45-125	0			
Butyl benzyl phthalate	638.3	33	666.7	0	95.7	50-125	0			
Chrysene	664.3	6.7	666.7	0	99.6	55-110	0			
Dibenzo(a,h)anthracene	713	6.7	666.7	0	107	40-125	0			
Diethyl phthalate	575.3	33	666.7	0	86.3	50-115	0			
Dimethyl phthalate	564.7	33	666.7	0	84.7	50-110	0			
Di-n-butyl phthalate	695.7	33	666.7	0	104	55-110	0			
Di-n-octyl phthalate	720	33	666.7	0	108	40-130	0			
Fluoranthene	678	6.7	666.7	0	102	55-115	0			
Fluorene	575	6.7	666.7	0	86.2	50-110	0			
Hexachlorobenzene	620.7	33	666.7	0	93.1	45-120	0			
Hexachlorobutadiene	563.3	33	666.7	0	84.5	40-115	0			
Hexachlorocyclopentadiene	440.3	33	666.7	0	66	40-115	0			
Hexachloroethane	557.3	33	666.7	0	83.6	35-110	0			
Indeno(1,2,3-cd)pyrene	672.7	6.7	666.7	0	101	40-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **86393** Instrument ID **SVMS5** Method: **SW8270C**

Isophorone	580.7	170	666.7	0	87.1	45-110	0
Naphthalene	569	6.7	666.7	0	85.3	40-105	0
Nitrobenzene	597.7	170	666.7	0	89.6	40-115	0
N-Nitrosodimethylamine	683	170	666.7	0	102	20-115	0
N-Nitrosodi-n-propylamine	602.7	33	666.7	0	90.4	40-115	0
N-Nitrosodiphenylamine	693.3	33	666.7	0	104	50-115	0
Pentachlorophenol	502.7	33	666.7	0	75.4	25-120	0
Phenanthrene	637.7	6.7	666.7	0	95.6	50-110	0
Phenol	651.7	33	666.7	0	97.7	40-100	0
Pyrene	727	6.7	666.7	0	109	45-125	0
Surr: 2,4,6-Tribromophenol	*1512*	0	*1667*	0	*90.7*	*34-140*	0
Surr: 2-Fluorobiphenyl	*1322*	0	*1667*	0	*79.3*	*12-100*	0
Surr: 2-Fluorophenol	*1669*	0	*1667*	0	*100*	*33-117*	0
Surr: 4-Terphenyl-d14	*1733*	0	*1667*	0	*104*	*25-137*	0
Surr: Nitrobenzene-d5	*1330*	0	*1667*	0	*79.8*	*37-107*	0
Surr: Phenol-d6	*1544*	0	*1667*	0	*92.6*	*40-106*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86393** Instrument ID **SVMS5** Method: **SW8270C**

MS Sample ID: **1605959-07B MS** Units: **µg/Kg** Analysis Date: **5/23/2016 07:08 PM**

Client ID: **RCK001:66/33:SB16-1161-3** Run ID: **SVMS5_160523A** SeqNo: **3844190** Prep Date: **5/23/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	690.6	32	656.2	0	105	55-115	0			
2,4,6-Trichlorophenol	479.3	32	656.2	0	73	45-110	0			
2,4-Dichlorophenol	539.3	32	656.2	0	82.2	45-110	0			
2,4-Dimethylphenol	536.1	32	656.2	0	81.7	30-105	0			
2,4-Dinitrophenol	319.5	32	656.2	0	48.7	15-130	0			
2,4-Dinitrotoluene	487.5	32	656.2	0	74.3	50-115	0			
2,6-Dinitrotoluene	487.5	32	656.2	0	74.3	50-110	0			
2-Chloronaphthalene	464.2	6.6	656.2	0	70.7	45-105	0			
2-Chlorophenol	420.9	32	656.2	0	64.1	45-105	0			
2-Nitrophenol	471.8	32	656.2	0	71.9	40-110	0			
3,3´-Dichlorobenzidine	299.5	160	656.2	0	45.6	30-120	0			
4,6-Dinitro-2-methylphenol	399.3	32	656.2	38.31	55	40-130	0			
4-Bromophenyl phenyl ether	621.4	32	656.2	0	94.7	45-115	0			
4-Chloro-3-methylphenol	591.8	32	656.2	0	90.2	45-115	0			
4-Chlorophenyl phenyl ether	486.8	32	656.2	0	74.2	45-110	0			
4-Nitrophenol	386.1	32	656.2	0	58.8	15-140	0			
Acenaphthene	466.5	6.6	656.2	0	71.1	45-110	0			
Acenaphthylene	489.1	6.6	656.2	0	74.5	45-105	0			
Anthracene	597.4	6.6	656.2	0	91	55-105	0			
Benzo(a)anthracene	588.2	6.6	656.2	0	89.6	50-110	0			
Benzo(a)pyrene	593.8	6.6	656.2	0	90.5	50-110	0			
Benzo(b)fluoranthene	585.3	6.6	656.2	0	89.2	45-115	0			
Benzo(g,h,i)perylene	544.9	6.6	656.2	0	83	40-125	0			
Benzo(k)fluoranthene	581.3	6.6	656.2	0	88.6	45-115	0			
Bis(2-chloroethoxy)methane	430.4	32	656.2	0	65.6	45-110	0			
Bis(2-chloroethyl)ether	368.4	32	656.2	0	56.1	40-105	0			
Bis(2-ethylhexyl)phthalate	580.3	32	656.2	0	88.4	45-125	0			
Butyl benzyl phthalate	604.3	32	656.2	0	92.1	50-125	0			
Chrysene	581	6.6	656.2	0	88.5	55-110	0			
Dibenzo(a,h)anthracene	631.5	6.6	656.2	0	96.2	40-125	0			
Diethyl phthalate	488.2	32	656.2	26.09	70.4	50-115	0			
Dimethyl phthalate	479	32	656.2	19.81	70	50-110	0			
Di-n-butyl phthalate	599.4	32	656.2	0	91.3	55-110	0			
Di-n-octyl phthalate	639.1	32	656.2	0	97.4	40-130	0			
Fluoranthene	559	6.6	656.2	17.5	82.5	55-115	0			
Fluorene	488.8	6.6	656.2	15.52	72.1	50-110	0			
Hexachlorobenzene	578.4	32	656.2	0	88.1	45-120	0			
Hexachlorobutadiene	436.7	32	656.2	0	66.5	40-115	0			
Hexachlorocyclopentadiene	270.7	32	656.2	0	41.2	40-115	0			
Hexachloroethane	399.6	32	656.2	0	60.9	35-110	0			
Indeno(1,2,3-cd)pyrene	586.2	6.6	656.2	0	89.3	40-120	0			
Isophorone	425.8	160	656.2	0	64.9	45-110	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **86393** Instrument ID **SVMS5** Method: **SW8270C**

Naphthalene	444.2	6.6	656.2	36.32	62.2	40-105	0
Nitrobenzene	415	160	656.2	0	63.2	40-115	0
N-Nitrosodimethylamine	417	160	656.2	0	63.5	20-115	0
N-Nitrosodi-n-propylamine	436	32	656.2	0	66.4	40-115	0
N-Nitrosodiphenylamine	674.5	32	656.2	0	103	50-115	0
Pentachlorophenol	451.7	32	656.2	0	68.8	25-120	0
Phenanthrene	598.4	6.6	656.2	48.21	83.8	50-110	0
Phenol	455.4	32	656.2	0	69.4	40-100	0
Pyrene	683.4	6.6	656.2	23.78	101	45-125	0
Surr: 2,4,6-Tribromophenol	*1355*	0	*1640*	0	*82.6*	*34-140*	0
Surr: 2-Fluorobiphenyl	*1065*	0	*1640*	0	*64.9*	*12-100*	0
Surr: 2-Fluorophenol	*1049*	0	*1640*	0	*63.9*	*33-117*	0
Surr: 4-Terphenyl-d14	*1571*	0	*1640*	0	*95.8*	*25-137*	0
Surr: Nitrobenzene-d5	*856.9*	0	*1640*	0	*52.2*	*37-107*	0
Surr: Phenol-d6	*998*	0	*1640*	0	*60.8*	*40-106*	0

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86393** Instrument ID **SVMS5** Method: **SW8270C**

MSD Sample ID: **1605959-07B MSD** Units: **µg/Kg** Analysis Date: **5/24/2016 08:44 PM**

Client ID: **RCK001:66/33:SB16-1161-3** Run ID: **SVMS5_160524A** SeqNo: **3846198** Prep Date: **5/23/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	624.3	32	652.4	0	95.7	55-115	690.6	10.1	30	
2,4,6-Trichlorophenol	506.5	32	652.4	0	77.6	45-110	479.3	5.53	30	
2,4-Dichlorophenol	587.4	32	652.4	0	90	45-110	539.3	8.54	30	
2,4-Dimethylphenol	505.9	32	652.4	0	77.5	30-105	536.1	5.79	30	
2,4-Dinitrophenol	329.8	32	652.4	0	50.5	15-130	319.5	3.15	30	
2,4-Dinitrotoluene	477.5	32	652.4	0	73.2	50-115	487.5	2.07	30	
2,6-Dinitrotoluene	477.5	32	652.4	0	73.2	50-110	487.5	2.07	30	
2-Chloronaphthalene	461.5	6.5	652.4	0	70.7	45-105	464.2	0.579	30	
2-Chlorophenol	480.4	32	652.4	0	73.6	45-105	420.9	13.2	30	
2-Nitrophenol	464.5	32	652.4	0	71.2	40-110	471.8	1.56	30	
3,3´-Dichlorobenzidine	268.8	160	652.4	0	41.2	30-120	299.5	10.8	30	
4,6-Dinitro-2-methylphenol	383.6	32	652.4	38.31	52.9	40-130	399.3	4.01	30	
4-Bromophenyl phenyl ether	568.2	32	652.4	0	87.1	45-115	621.4	8.94	30	
4-Chloro-3-methylphenol	632.8	32	652.4	0	97	45-115	591.8	6.69	30	
4-Chlorophenyl phenyl ether	514	32	652.4	0	78.8	45-110	486.8	5.43	30	
4-Nitrophenol	462.2	32	652.4	0	70.8	15-140	386.1	17.9	30	
Acenaphthene	472.6	6.5	652.4	0	72.4	45-110	466.5	1.3	30	
Acenaphthylene	486.6	6.5	652.4	0	74.6	45-105	489.1	0.512	30	
Anthracene	596.9	6.5	652.4	0	91.5	55-105	597.4	0.086	30	
Benzo(a)anthracene	582.2	6.5	652.4	0	89.2	50-110	588.2	1.03	30	
Benzo(a)pyrene	586.8	6.5	652.4	0	89.9	50-110	593.8	1.19	30	
Benzo(b)fluoranthene	625.9	6.5	652.4	0	95.9	45-115	585.3	6.71	30	
Benzo(g,h,i)perylene	472.9	6.5	652.4	0	72.5	40-125	544.9	14.1	30	
Benzo(k)fluoranthene	587.1	6.5	652.4	0	90	45-115	581.3	0.989	30	
Bis(2-chloroethoxy)methane	447.5	32	652.4	0	68.6	45-110	430.4	3.89	30	
Bis(2-chloroethyl)ether	396.3	32	652.4	0	60.7	40-105	368.4	7.29	30	
Bis(2-ethylhexyl)phthalate	615.2	32	652.4	0	94.3	45-125	580.3	5.82	30	
Butyl benzyl phthalate	605.4	32	652.4	0	92.8	50-125	604.3	0.178	30	
Chrysene	566.2	6.5	652.4	0	86.8	55-110	581	2.57	30	
Dibenzo(a,h)anthracene	543.1	6.5	652.4	0	83.2	40-125	631.5	15.1	30	
Diethyl phthalate	510.8	32	652.4	26.09	74.3	50-115	488.2	4.53	30	
Dimethyl phthalate	491.2	32	652.4	19.81	72.3	50-110	479	2.52	30	
Di-n-butyl phthalate	613.2	32	652.4	0	94	55-110	599.4	2.28	30	
Di-n-octyl phthalate	827.2	32	652.4	0	127	40-130	639.1	25.7	30	
Fluoranthene	612.5	6.5	652.4	17.5	91.2	55-115	559	9.14	30	
Fluorene	521.5	6.5	652.4	15.52	77.6	50-110	488.8	6.48	30	
Hexachlorobenzene	557.1	32	652.4	0	85.4	45-120	578.4	3.75	30	
Hexachlorobutadiene	412.3	32	652.4	0	63.2	40-115	436.7	5.74	30	
Hexachlorocyclopentadiene	170.6	32	652.4	0	26.1	40-115	270.7	45.4	30	SR
Hexachloroethane	379.3	32	652.4	0	58.1	35-110	399.6	5.2	30	
Indeno(1,2,3-cd)pyrene	529.7	6.5	652.4	0	81.2	40-120	586.2	10.1	30	
Isophorone	442.9	160	652.4	0	67.9	45-110	425.8	3.94	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **86393** Instrument ID **SVMS5** Method: **SW8270C**

Naphthalene	440.3	6.5	652.4	36.32	61.9	40-105	444.2	0.875	30
Nitrobenzene	427.9	160	652.4	0	65.6	40-115	415	3.07	30
N-Nitrosodimethylamine	442.9	160	652.4	0	67.9	20-115	417	6.04	30
N-Nitrosodi-n-propylamine	454.4	32	652.4	0	69.6	40-115	436	4.12	30
N-Nitrosodiphenylamine	631.5	32	652.4	0	96.8	50-115	674.5	6.59	30
Pentachlorophenol	472.6	32	652.4	0	72.4	25-120	451.7	4.52	30
Phenanthrene	609.3	6.5	652.4	48.21	86	50-110	598.4	1.8	30
Phenol	527.4	32	652.4	0	80.8	40-100	455.4	14.7	30
Pyrene	649.4	6.5	652.4	23.78	95.9	45-125	683.4	5.1	30
Surr: 2,4,6-Tribromophenol	*1291*	0	*1631*	0	*79.2*	*34-140*	1355	*4.83*	*40*
Surr: 2-Fluorobiphenyl	*1038*	0	*1631*	0	*63.6*	*12-100*	1065	*2.6*	*40*
Surr: 2-Fluorophenol	*1186*	0	*1631*	0	*72.7*	*33-117*	1049	*12.2*	*40*
Surr: 4-Terphenyl-d14	*1508*	0	*1631*	0	*92.5*	*25-137*	1571	*4.11*	*40*
Surr: Nitrobenzene-d5	*906.7*	0	*1631*	0	*55.6*	*37-107*	856.9	*5.65*	*40*
Surr: Phenol-d6	*1159*	0	*1631*	0	*71*	*40-106*	998	*14.9*	*40*

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86325** Instrument ID **VMS5** Method: **SW8260A**

MBLK Sample ID: **MBLK-86325-86325** Units: **µg/Kg-dry** Analysis Date: **5/20/2016 03:04 PM**
Client ID: Run ID: **VMS5_160520A** SeqNo: **3841133** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	U	30								
1,1,2,2-Tetrachloroethane	U	30								
1,1,2-Trichloroethane	U	30								
1,1-Dichloroethane	U	30								
1,1-Dichloroethene	U	30								
1,2-Dichlorobenzene	U	30								
1,2-Dichloroethane	U	30								
1,2-Dichloropropane	U	30								
1,3-Dichlorobenzene	U	30								
1,4-Dichlorobenzene	U	30								
Acrolein	U	200								
Acrylonitrile	U	100								
Benzene	U	30								
Bromodichloromethane	U	30								
Bromoform	U	30								
Bromomethane	U	75								
Carbon tetrachloride	U	30								
Chlorobenzene	U	30								
Chloroethane	U	100								
Chloroform	U	30								
Chloromethane	U	100								
cis-1,2-Dichloroethene	U	30								
cis-1,3-Dichloropropene	U	30								
Dibromochloromethane	U	30								
Ethylbenzene	U	30								
Methylene chloride	U	30								
Tetrachloroethene	U	30								
Toluene	U	30								
trans-1,2-Dichloroethene	U	30								
trans-1,3-Dichloropropene	U	30								
Trichloroethene	U	30								
Vinyl chloride	U	30								
Surr: 1,2-Dichloroethane-d4	*973.5*	0	*1000*	0	*97.4*	*70-120*	0			
Surr: 4-Bromofluorobenzene	*961*	0	*1000*	0	*96.1*	*75-120*	0			
Surr: Dibromofluoromethane	*1007*	0	*1000*	0	*101*	*85-115*	0			
Surr: Toluene-d8	*985.5*	0	*1000*	0	*98.6*	*85-120*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86325** Instrument ID **VMS5** Method: **SW8260A**

LCS Sample ID: **LCS-86325-86325** Units: **µg/Kg-dry** Analysis Date: **5/20/2016 01:19 PM**
Client ID: Run ID: **VMS5_160520A** SeqNo: **3841129** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	1132	30	1000	0	113	70-135	0			
1,1,2,2-Tetrachloroethane	1084	30	1000	0	108	55-130	0			
1,1,2-Trichloroethane	1101	30	1000	0	110	60-125	0			
1,1-Dichloroethane	1136	30	1000	0	114	75-125	0			
1,1-Dichloroethene	1141	30	1000	0	114	65-135	0			
1,2-Dichlorobenzene	1092	30	1000	0	109	75-120	0			
1,2-Dichloroethane	1042	30	1000	0	104	70-135	0			
1,2-Dichloropropane	1076	30	1000	0	108	70-120	0			
1,3-Dichlorobenzene	1129	30	1000	0	113	70-125	0			
1,4-Dichlorobenzene	1087	30	1000	0	109	70-125	0			
Acrylonitrile	1004	100	1000	0	100	70-135	0			
Benzene	1138	30	1000	0	114	75-125	0			
Bromodichloromethane	1114	30	1000	0	111	70-130	0			
Bromoform	980	30	1000	0	98	55-135	0			
Bromomethane	1256	75	1000	0	126	30-160	0			
Carbon tetrachloride	1046	30	1000	0	105	65-135	0			
Chlorobenzene	1093	30	1000	0	109	75-125	0			
Chloroethane	1096	100	1000	0	110	40-155	0			
Chloroform	1056	30	1000	0	106	70-125	0			
Chloromethane	1042	100	1000	0	104	50-130	0			
cis-1,2-Dichloroethene	1064	30	1000	0	106	65-125	0			
cis-1,3-Dichloropropene	1192	30	1000	0	119	70-125	0			
Dibromochloromethane	1072	30	1000	0	107	65-135	0			
Ethylbenzene	1124	30	1000	0	112	75-125	0			
Methylene chloride	1090	30	1000	0	109	55-145	0			
Tetrachloroethene	1129	30	1000	0	113	64-140	0			
Toluene	1084	30	1000	0	108	70-125	0			
trans-1,2-Dichloroethene	1136	30	1000	0	114	65-135	0			
trans-1,3-Dichloropropene	960.5	30	1000	0	96	65-125	0			
Trichloroethene	1156	30	1000	0	116	75-125	0			
Vinyl chloride	1187	30	1000	0	119	60-125	0			
Surr: 1,2-Dichloroethane-d4	*966.5*	0	*1000*	0	*96.6*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*995.5*	0	*1000*	0	*99.6*	*70-130*	0			
Surr: Dibromofluoromethane	*998*	0	*1000*	0	*99.8*	*70-130*	0			
Surr: Toluene-d8	*989.5*	0	*1000*	0	*99*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86325** Instrument ID **VMS5** Method: **SW8260A**

MS Sample ID: **1605959-02A MS** Units: **µg/Kg-dry** Analysis Date: **5/20/2016 10:31 PM**

Client ID: **RCK001:66/33:SB16-1161-1** Run ID: **VMS5_160520A** SeqNo: **3840563** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	1482	45	1500	0	98.8	70-135	0			
1,1,2,2-Tetrachloroethane	1416	45	1500	0	94.4	55-130	0			
1,1,2-Trichloroethane	1598	45	1500	0	107	60-125	0			
1,1-Dichloroethane	1594	45	1500	0	106	75-125	0			
1,1-Dichloroethene	1583	45	1500	0	106	65-135	0			
1,2-Dichlorobenzene	1484	45	1500	0	99	75-120	0			
1,2-Dichloroethane	1494	45	1500	0	99.6	70-135	0			
1,2-Dichloropropane	1598	45	1500	0	107	70-120	0			
1,3-Dichlorobenzene	1476	45	1500	0	98.4	70-125	0			
1,4-Dichlorobenzene	1450	45	1500	0	96.6	70-125	0			
Acrylonitrile	1562	150	1500	0	104	70-135	0			
Benzene	1598	45	1500	0	107	75-125	0			
Bromodichloromethane	1509	45	1500	0	101	70-130	0			
Bromoform	1276	45	1500	0	85.1	55-135	0			
Bromomethane	754.5	110	1500	0	50.3	30-160	0			
Carbon tetrachloride	1439	45	1500	0	96	65-135	0			
Chlorobenzene	1518	45	1500	0	101	75-125	0			
Chloroethane	1280	150	1500	0	85.3	40-155	0			
Chloroform	1500	45	1500	0	100	70-125	0			
Chloromethane	1521	150	1500	0	101	50-130	0			
cis-1,2-Dichloroethene	1486	45	1500	0	99.1	65-125	0			
cis-1,3-Dichloropropene	1601	45	1500	0	107	70-125	0			
Dibromochloromethane	1410	45	1500	0	94	65-135	0			
Ethylbenzene	1544	45	1500	0	103	75-125	0			
Methylene chloride	1617	45	1500	0	108	55-145	0			
Tetrachloroethene	2650	45	1500	0	177	64-140	0			S
Toluene	1503	45	1500	22.5	98.7	70-125	0			
trans-1,2-Dichloroethene	1564	45	1500	0	104	65-135	0			
trans-1,3-Dichloropropene	1302	45	1500	0	86.8	65-125	0			
Trichloroethene	1624	45	1500	0	108	75-125	0			
Vinyl chloride	1614	45	1500	0	108	60-125	0			
Surr: 1,2-Dichloroethane-d4	*1449*	0	*1500*	0	*96.6*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1531*	0	*1500*	0	*102*	*70-130*	0			
Surr: Dibromofluoromethane	*1513*	0	*1500*	0	*101*	*70-130*	0			
Surr: Toluene-d8	*1468*	0	*1500*	0	*97.8*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86325** Instrument ID **VMS5** Method: **SW8260A**

MSD Sample ID: **1605959-02A MSD** Units: **µg/Kg-dry** Analysis Date: **5/20/2016 10:57 PM**

Client ID: **RCK001:66/33:SB16-1161-1** Run ID: **VMS5_160520A** SeqNo: **3840565** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	1586	45	1500	0	106	70-135	1482	6.75	30	
1,1,2,2-Tetrachloroethane	1312	45	1500	0	87.4	55-130	1416	7.64	30	
1,1,2-Trichloroethane	1623	45	1500	0	108	60-125	1598	1.54	30	
1,1-Dichloroethane	1649	45	1500	0	110	75-125	1594	3.42	30	
1,1-Dichloroethene	1688	45	1500	0	113	65-135	1583	6.42	30	
1,2-Dichlorobenzene	1582	45	1500	0	106	75-120	1484	6.41	30	
1,2-Dichloroethane	1508	45	1500	0	101	70-135	1494	0.949	30	
1,2-Dichloropropane	1629	45	1500	0	109	70-120	1598	1.91	30	
1,3-Dichlorobenzene	1569	45	1500	0	105	70-125	1476	6.11	30	
1,4-Dichlorobenzene	1550	45	1500	0	103	70-125	1450	6.65	30	
Acrylonitrile	1558	150	1500	0	104	70-135	1562	0.288	30	
Benzene	1642	45	1500	0	109	75-125	1598	2.69	30	
Bromodichloromethane	1540	45	1500	0	103	70-130	1509	2.02	30	
Bromoform	1318	45	1500	0	87.8	55-135	1276	3.18	30	
Bromomethane	879.8	110	1500	0	58.6	30-160	754.5	15.3	30	
Carbon tetrachloride	1516	45	1500	0	101	65-135	1439	5.18	30	
Chlorobenzene	1570	45	1500	0	105	75-125	1518	3.4	30	
Chloroethane	1366	150	1500	0	91	40-155	1280	6.52	30	
Chloroform	1558	45	1500	0	104	70-125	1500	3.78	30	
Chloromethane	1575	150	1500	0	105	50-130	1521	3.49	30	
cis-1,2-Dichloroethene	1522	45	1500	0	101	65-125	1486	2.34	30	
cis-1,3-Dichloropropene	1642	45	1500	0	109	70-125	1601	2.5	30	
Dibromochloromethane	1442	45	1500	0	96.1	65-135	1410	2.21	30	
Ethylbenzene	1616	45	1500	0	108	75-125	1544	4.51	30	
Methylene chloride	1666	45	1500	0	111	55-145	1617	2.97	30	
Tetrachloroethene	2914	45	1500	0	194	64-140	2650	9.52	30	S
Toluene	1591	45	1500	22.5	105	70-125	1503	5.67	30	
trans-1,2-Dichloroethene	1651	45	1500	0	110	65-135	1564	5.41	30	
trans-1,3-Dichloropropene	1345	45	1500	0	89.6	65-125	1302	3.23	30	
Trichloroethene	1822	45	1500	0	121	75-125	1624	11.4	30	
Vinyl chloride	1703	45	1500	0	114	60-125	1614	5.38	30	
Surr: 1,2-Dichloroethane-d4	*1437*	0	*1500*	0	*95.8*	*70-130*	1449	*0.832*	*30*	
Surr: 4-Bromofluorobenzene	*1530*	0	*1500*	0	*102*	*70-130*	1531	*0.049*	*30*	
Surr: Dibromofluoromethane	*1476*	0	*1500*	0	*98.4*	*70-130*	1513	*2.46*	*30*	
Surr: Toluene-d8	*1484*	0	*1500*	0	*98.9*	*70-130*	1468	*1.07*	*30*	

The following samples were analyzed in this batch:

1605959-01A	1605959-02A	1605959-03A
1605959-04A	1605959-05A	1605959-06A
1605959-07A	1605959-08A	1605959-09A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86207** Instrument ID **WETCHEM** Method: **SW9045D**

LCS Sample ID: **LCS-86207-86207** Units: **s.u.** Analysis Date: **5/18/2016 01:30 PM**
Client ID: Run ID: **WETCHEM_160518L** SeqNo: **3834558** Prep Date: **5/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	4.04	0	4	0	101	90-110	0			

DUP Sample ID: **1605943-01A DUP** Units: **s.u.** Analysis Date: **5/18/2016 01:30 PM**
Client ID: Run ID: **WETCHEM_160518L** SeqNo: **3834562** Prep Date: **5/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	6.18	0	0	0	0	0-0	6.14	0.649	20	HH

DUP Sample ID: **1605959-01B DUP** Units: **s.u.** Analysis Date: **5/18/2016 01:30 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **WETCHEM_160518L** SeqNo: **3834565** Prep Date: **5/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	8.66	0	0	0	0	0-0	8.57	1.04	20	

The following samples were analyzed in this batch: 1605959-01B 1605959-02B 1605959-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86226** Instrument ID **WETCHEM** Method: **A5210B-97**

MBLK Sample ID: **MBLK-86226-86226** Units: **mg/Kg** Analysis Date: **5/24/2016 10:30 AM**
Client ID: Run ID: **WETCHEM_160524C** SeqNo: **3843846** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	U	20								

LCS Sample ID: **LCS-86226-86226** Units: **mg/Kg** Analysis Date: **5/24/2016 10:30 AM**
Client ID: Run ID: **WETCHEM_160524C** SeqNo: **3843847** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	1734	20	1980	0	87.6	85-115	0			

DUP Sample ID: **1605959-01B DUP** Units: **mg/Kg** Analysis Date: **5/24/2016 10:30 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **WETCHEM_160524C** SeqNo: **3843849** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	U	10	0	0	0		0	0	20	

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86239** Instrument ID **GALLERY** Method: **A4500-Cl E-97**

MBLK Sample ID: **MBLK-86239-86239** Units: **mg/Kg** Analysis Date: **5/23/2016 08:30 PM**
Client ID: Run ID: **GALLERY_160523D** SeqNo: **3842694** Prep Date: **5/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	10								

MS Sample ID: **1605959-04B MS** Units: **mg/Kg** Analysis Date: **5/23/2016 08:30 PM**
Client ID: **RCK001:50/50:SB16-1160-2** Run ID: **GALLERY_160523D** SeqNo: **3842699** Prep Date: **5/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	524	10	499	18.96	101	75-125	0			

MSD Sample ID: **1605959-04B MSD** Units: **mg/Kg** Analysis Date: **5/23/2016 08:30 PM**
Client ID: **RCK001:50/50:SB16-1160-2** Run ID: **GALLERY_160523D** SeqNo: **3842700** Prep Date: **5/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	523.3	9.9	497	18.96	101	75-125	524	0.132	25	

LCS1 Sample ID: **LCS1-86239-86239** Units: **mg/Kg** Analysis Date: **5/23/2016 08:30 PM**
Client ID: Run ID: **GALLERY_160523D** SeqNo: **3842706** Prep Date: **5/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	99.19	10	100	0	99.2	80-120	0			

LCS2 Sample ID: **LCS2-86239-86239** Units: **mg/Kg** Analysis Date: **5/23/2016 08:30 PM**
Client ID: Run ID: **GALLERY_160523D** SeqNo: **3842707** Prep Date: **5/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	513.8	10	500	0	103	80-120	0			

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86240** Instrument ID **WETCHEM** Method: **E410.4 R2.0**

MBLK Sample ID: **MBLK-86240-86240** Units: **mg/Kg** Analysis Date: **5/18/2016 12:25 PM**
Client ID: Run ID: **WETCHEM_160518V** SeqNo: **3835104** Prep Date: **5/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	U	500								

LCS Sample ID: **LCS-86240-86240** Units: **mg/Kg** Analysis Date: **5/18/2016 12:25 PM**
Client ID: Run ID: **WETCHEM_160518V** SeqNo: **3835105** Prep Date: **5/18/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	6104	500	6000	0	102	90-110	0			

MS Sample ID: **1605959-01B MS** Units: **mg/Kg** Analysis Date: **5/18/2016 12:25 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **WETCHEM_160518V** SeqNo: **3835108** Prep Date: **5/18/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	6386	1,000	5976	306.9	102	80-120	0			

MSD Sample ID: **1605959-01B MSD** Units: **mg/Kg** Analysis Date: **5/18/2016 12:25 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **WETCHEM_160518V** SeqNo: **3835109** Prep Date: **5/18/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	6453	980	5906	306.9	104	80-120	6386	1.05	20	

The following samples were analyzed in this batch: 1605959-01B 1605959-02B 1605959-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86302** Instrument ID **WETCHEM** Method: **SW9045D**

LCS	Sample ID: **LCS-86302-86302**				Units: **s.u.**			Analysis Date: **5/19/2016 06:07 PM**			
Client ID:	Run ID: **WETCHEM_160519J**				SeqNo: **3837507**			Prep Date: **5/19/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
pH	3.97	0	4	0	99.2	90-110	0				

DUP	Sample ID: **16051021-01A DUP**				Units: **s.u.**			Analysis Date: **5/19/2016 06:07 PM**			
Client ID:	Run ID: **WETCHEM_160519J**				SeqNo: **3837438**			Prep Date: **5/19/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual	
pH	8.44	0	0	0	0	0-0	8.27	2.03	20		

The following samples were analyzed in this batch:

1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86331** Instrument ID **LACHAT** Method: **SW9012B**

MBLK Sample ID: **MBLK-86331-86331** Units: **mg/Kg** Analysis Date: **5/25/2016 10:14 AM**
Client ID: Run ID: **LACHAT_160525A** SeqNo: **3846450** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	U	0.50								

LCS Sample ID: **LCS-86331-86331** Units: **mg/Kg** Analysis Date: **5/25/2016 10:14 AM**
Client ID: Run ID: **LACHAT_160525A** SeqNo: **3846451** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.282	0.50	2.5	0	91.3	85-119	0			

MS Sample ID: **1605959-01B MS** Units: **mg/Kg** Analysis Date: **5/25/2016 10:14 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT_160525A** SeqNo: **3846453** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.137	0.50	2.5	0.04299	83.8	70-130	0			

MSD Sample ID: **1605959-01B MSD** Units: **mg/Kg** Analysis Date: **5/25/2016 10:14 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT_160525A** SeqNo: **3846454** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	1.932	0.49	2.47	0.04299	76.5	70-130	2.137	10.1	30	

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86334** Instrument ID **LACHAT2** Method: **E365.1 R2.0**

MBLK Sample ID: **MBLK-86334-86334** Units: **mg/Kg** Analysis Date: **5/20/2016 10:47 AM**
Client ID: Run ID: **LACHAT2_160520C** SeqNo: **3838857** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	U	5.0								

LCS Sample ID: **LCS-86334-86334** Units: **mg/Kg** Analysis Date: **5/20/2016 10:47 AM**
Client ID: Run ID: **LACHAT2_160520C** SeqNo: **3838858** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	10.45	5.0	10	0	104	90-110	0			

MS Sample ID: **1605959-01B MS** Units: **mg/Kg** Analysis Date: **5/20/2016 10:47 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT2_160520C** SeqNo: **3838874** Prep Date: **5/19/2016** DF: **30**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	212	150	9.709	222.1	-103	90-110	0			SO

MS Sample ID: **1605822-01A MS** Units: **mg/Kg** Analysis Date: **5/20/2016 10:47 AM**
Client ID: Run ID: **LACHAT2_160520C** SeqNo: **3838884** Prep Date: **5/19/2016** DF: **200**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	4209	2,100	21.37	5293	-5070	90-110	0			SO

MSD Sample ID: **1605959-01B MSD** Units: **mg/Kg** Analysis Date: **5/20/2016 10:47 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT2_160520C** SeqNo: **3838875** Prep Date: **5/19/2016** DF: **30**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	193.5	150	10	222.1	-286	90-110	212	9.13	20	SO

MSD Sample ID: **1605822-01A MSD** Units: **mg/Kg** Analysis Date: **5/20/2016 10:47 AM**
Client ID: Run ID: **LACHAT2_160520C** SeqNo: **3838885** Prep Date: **5/19/2016** DF: **200**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	5794	2,000	19.84	5293	2520	90-110	4209	31.7	20	SRO

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86335** Instrument ID **WETCHEM** Method: **A4500-NO2 B**

MBLK Sample ID: **MBLK-86335-86335** Units: **mg/Kg** Analysis Date: **5/20/2016 03:15 PM**
Client ID: Run ID: **WETCHEM_160520K** SeqNo: **3839425** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	U	0.70								

LCS Sample ID: **LCS-86335-86335** Units: **mg/Kg** Analysis Date: **5/20/2016 03:15 PM**
Client ID: Run ID: **WETCHEM_160520K** SeqNo: **3839426** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	1.916	0.70	2	0	95.8	80-120	0			

MS Sample ID: **1605959-01B MS** Units: **mg/Kg** Analysis Date: **5/20/2016 03:15 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **WETCHEM_160520K** SeqNo: **3839432** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	1.747	0.70	2	0.033	85.7	75-125	0			

MSD Sample ID: **1605959-01B MSD** Units: **mg/Kg** Analysis Date: **5/20/2016 03:15 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **WETCHEM_160520K** SeqNo: **3839433** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	1.893	0.70	2	0.033	93	75-125	1.747	8.02	20	

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86336** Instrument ID **LACHAT2** Method: **E353.2**

MBLK Sample ID: **MBLK-86336-86336** Units: **mg/Kg** Analysis Date: **5/24/2016 11:35 AM**
Client ID: Run ID: **LACHAT2_160524C** SeqNo: **3844283** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	U	1.0								

LCS Sample ID: **LCS-86336-86336** Units: **mg/Kg** Analysis Date: **5/24/2016 11:35 AM**
Client ID: Run ID: **LACHAT2_160524C** SeqNo: **3844284** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	52.04	1.0	50	0	104	80-120	0			

MS Sample ID: **1605959-01B MS** Units: **mg/Kg** Analysis Date: **5/24/2016 11:35 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT2_160524C** SeqNo: **3844289** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	49.54	1.0	50	0.5489	98	75-125	0			

MSD Sample ID: **1605959-01B MSD** Units: **mg/Kg** Analysis Date: **5/24/2016 11:35 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT2_160524C** SeqNo: **3844290** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	46.7	0.97	48.64	0.5489	94.9	75-125	49.54	5.9	35	

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86337** Instrument ID **LACHAT2** Method: **E353.2**

MBLK Sample ID: **MBLK-86337-86337** Units: **mg/Kg** Analysis Date: **5/24/2016 11:35 AM**
Client ID: Run ID: **LACHAT2_160524E** SeqNo: **3844328** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	U	1.0								

LCS Sample ID: **LCS-86337-86337** Units: **mg/Kg** Analysis Date: **5/24/2016 11:35 AM**
Client ID: Run ID: **LACHAT2_160524E** SeqNo: **3844329** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	49.1	1.0	50	0	98.2	80-120	0			

MS Sample ID: **1605959-01B MS** Units: **mg/Kg** Analysis Date: **5/24/2016 11:35 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT2_160524E** SeqNo: **3844331** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	47.58	1.0	50	0.5359	94.1	75-125	0			

MSD Sample ID: **1605959-01B MSD** Units: **mg/Kg** Analysis Date: **5/24/2016 11:35 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT2_160524E** SeqNo: **3844332** Prep Date: **5/19/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	46.13	0.97	48.64	0.5359	93.7	75-125	47.58	3.1	35	

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86338** Instrument ID **LACHAT2** Method: **A4500-P E-97**

MBLK	Sample ID: **MBLK-86338-86338**				Units: **mg/Kg**			Analysis Date: **5/20/2016 01:29 PM**		
Client ID:	Run ID: **LACHAT2_160520E**				SeqNo: **3838990**			Prep Date: **5/19/2016**		DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	U	1.0								

LCS	Sample ID: **LCS-86338-86338**				Units: **mg/Kg**			Analysis Date: **5/20/2016 01:29 PM**		
Client ID:	Run ID: **LACHAT2_160520E**				SeqNo: **3838991**			Prep Date: **5/19/2016**		DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	9.53	1.0	10	0	95.3	90-110	0			

MS	Sample ID: **1605959-01B MS**				Units: **mg/Kg**			Analysis Date: **5/20/2016 01:29 PM**		
Client ID: **RCK001:50/50:SB16-1160-1**	Run ID: **LACHAT2_160520E**				SeqNo: **3838993**			Prep Date: **5/19/2016**		DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	10.82	0.97	9.653	1.11	101	90-110	0			

MSD	Sample ID: **1605959-01B MSD**				Units: **mg/Kg**			Analysis Date: **5/20/2016 01:29 PM**		
Client ID: **RCK001:50/50:SB16-1160-1**	Run ID: **LACHAT2_160520E**				SeqNo: **3838994**			Prep Date: **5/19/2016**		DF: **1**
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	11.01	0.99	9.862	1.11	100	90-110	10.82	1.7	20	

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86413** Instrument ID **LACHAT2** Method: **A4500-NH3 G-97**

MBLK Sample ID: **MBLK-86413-86413** Units: **mg NH3-N/Kg** Analysis Date: **5/23/2016 02:37 PM**
Client ID: Run ID: **LACHAT2_160523F** SeqNo: **3842286** Prep Date: **5/23/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	U	15								

LCS Sample ID: **LCS-86413-86413** Units: **mg NH3-N/Kg** Analysis Date: **5/23/2016 02:37 PM**
Client ID: Run ID: **LACHAT2_160523F** SeqNo: **3842287** Prep Date: **5/23/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	42.61	15	50	0	85.2	70-130	0			

MS Sample ID: **1605959-01B MS** Units: **mg NH3-N/Kg** Analysis Date: **5/23/2016 02:37 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT2_160523F** SeqNo: **3842324** Prep Date: **5/23/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	40.88	13	44.64	16.53	54.5	70-130	0			S

MSD Sample ID: **1605959-01B MSD** Units: **mg NH3-N/Kg** Analysis Date: **5/23/2016 02:37 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT2_160523F** SeqNo: **3842325** Prep Date: **5/23/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	41.85	13	43.86	16.53	57.7	70-130	40.88	2.34	30	S

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86418** Instrument ID **LACHAT** Method: **A4500-NH3 G-97**

MBLK	Sample ID: **MBLK-86418-86418**			Units: **mg/Kg**			Analysis Date: **5/24/2016 01:58 PM**			
Client ID:	Run ID: **LACHAT_160524B**			SeqNo: **3844606**			Prep Date: **5/23/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	U	5.0								

LCS	Sample ID: **LCS-86418-86418**			Units: **mg/Kg**			Analysis Date: **5/24/2016 01:58 PM**			
Client ID:	Run ID: **LACHAT_160524B**			SeqNo: **3844607**			Prep Date: **5/23/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	101.5	5.0	100	0	102	80-120	0			

MS	Sample ID: **1605959-01B MS**			Units: **mg/Kg**			Analysis Date: **5/24/2016 01:58 PM**			
Client ID: **RCK001:50/50:SB16-1160-1**	Run ID: **LACHAT_160524B**			SeqNo: **3844610**			Prep Date: **5/23/2016**		DF: **10**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	576.5	48	95.6	481.7	99.1	75-125	0			O

MSD	Sample ID: **1605959-01B MSD**			Units: **mg/Kg**			Analysis Date: **5/24/2016 01:58 PM**			
Client ID: **RCK001:50/50:SB16-1160-1**	Run ID: **LACHAT_160524B**			SeqNo: **3844611**			Prep Date: **5/23/2016**		DF: **10**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	544.3	48	96.9	481.7	64.6	75-125	576.5	5.75	35	SO

LCS2	Sample ID: **LCS2-86418-86418**			Units: **mg/Kg**			Analysis Date: **5/24/2016 01:58 PM**			
Client ID:	Run ID: **LACHAT_160524B**			SeqNo: **3844616**			Prep Date: **5/23/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	97.31	5.0	100	0	97.3	80-120	0			

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **86433** Instrument ID **WETCHEM** Method: **E410.4 R2.0**

MBLK Sample ID: **MBLK-86433-86433** Units: **mg/Kg** Analysis Date: **5/20/2016 03:15 PM**
Client ID: Run ID: **WETCHEM_160520P** SeqNo: **3842135** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	U	500								

LCS Sample ID: **LCS-86433-86433** Units: **mg/Kg** Analysis Date: **5/20/2016 03:15 PM**
Client ID: Run ID: **WETCHEM_160520P** SeqNo: **3842136** Prep Date: **5/20/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	6394	500	6000	0	107	90-110	0			

MS Sample ID: **1605959-04B MS** Units: **mg/Kg** Analysis Date: **5/20/2016 03:15 PM**
Client ID: **RCK001:50/50:SB16-1160-2** Run ID: **WETCHEM_160520P** SeqNo: **3842138** Prep Date: **5/20/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	6225	970	5825	210.1	103	80-120	0			

MSD Sample ID: **1605959-04B MSD** Units: **mg/Kg** Analysis Date: **5/20/2016 03:15 PM**
Client ID: **RCK001:50/50:SB16-1160-2** Run ID: **WETCHEM_160520P** SeqNo: **3842139** Prep Date: **5/20/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	6073	980	5906	210.1	99.3	80-120	6225	2.47	20	

The following samples were analyzed in this batch:

1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **R187768** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R187768** Units: **% of sample** Analysis Date: **5/17/2016 06:35 PM**
Client ID: Run ID: **MOIST_160517C** SeqNo: **3834353** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	U	0.050								

LCS Sample ID: **LCS-R187768** Units: **% of sample** Analysis Date: **5/17/2016 06:35 PM**
Client ID: Run ID: **MOIST_160517C** SeqNo: **3834352** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1605929-28C DUP** Units: **% of sample** Analysis Date: **5/17/2016 06:35 PM**
Client ID: Run ID: **MOIST_160517C** SeqNo: **3834335** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	10.62	0.050	0	0	0		10.67	0.47	20	

DUP Sample ID: **1605959-01B DUP** Units: **% of sample** Analysis Date: **5/17/2016 06:35 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **MOIST_160517C** SeqNo: **3834351** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	31.1	0.050	0	0	0		31.3	0.641	20	

The following samples were analyzed in this batch: 1605959-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **R187840** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R187840** Units: **% of sample** Analysis Date: **5/18/2016 04:29 PM**
Client ID: Run ID: **MOIST_160518B** SeqNo: **3836057** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	U	0.050								

LCS Sample ID: **LCS-R187840** Units: **% of sample** Analysis Date: **5/18/2016 04:29 PM**
Client ID: Run ID: **MOIST_160518B** SeqNo: **3836056** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1605959-03B DUP** Units: **% of sample** Analysis Date: **5/18/2016 04:29 PM**
Client ID: **RCK001:33/66:SB16-1162-1** Run ID: **MOIST_160518B** SeqNo: **3836036** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	38.55	0.050	0	0	0		37.46	2.87	20	

DUP Sample ID: **1605974-02A DUP** Units: **% of sample** Analysis Date: **5/18/2016 04:29 PM**
Client ID: Run ID: **MOIST_160518B** SeqNo: **3836040** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	22.06	0.050	0	0	0		25.04	12.7	20	

The following samples were analyzed in this batch: 1605959-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **R187941** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R187941** Units: **% of sample** Analysis Date: **5/19/2016 04:14 PM**
Client ID: Run ID: **MOIST_160519A** SeqNo: **3838268** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	U	0.050								

LCS Sample ID: **LCS-R187941** Units: **% of sample** Analysis Date: **5/19/2016 04:14 PM**
Client ID: Run ID: **MOIST_160519A** SeqNo: **3838267** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **1605959-04B DUP** Units: **% of sample** Analysis Date: **5/19/2016 04:14 PM**
Client ID: **RCK001:50/50:SB16-1160-2** Run ID: **MOIST_160519A** SeqNo: **3838258** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	31.71	0.050	0	0	0		30.95	2.43	20	

DUP Sample ID: **1605959-05B DUP** Units: **% of sample** Analysis Date: **5/19/2016 04:14 PM**
Client ID: **RCK001:50/50:SB16-1160-3** Run ID: **MOIST_160519A** SeqNo: **3838260** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	29.88	0.050	0	0	0		30.76	2.9	20	

The following samples were analyzed in this batch:

1605959-02B	1605959-04B	1605959-05B
1605959-06B	1605959-07B	1605959-08B
1605959-09B		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1605959
Project: RCK001

QC BATCH REPORT

Batch ID: **R188080** Instrument ID **WETCHEM** Method: **TITRAMETRIC**

MBLK Sample ID: **WBLKS1-160523-R188080** Units: **% by wt** Analysis Date: **5/23/2016 12:10 PM**
Client ID: Run ID: **WETCHEM_160523I** SeqNo: **3841918** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	U	0.025								

LCS Sample ID: **WLCSS1-160523-R188080** Units: **% by wt** Analysis Date: **5/23/2016 12:10 PM**
Client ID: Run ID: **WETCHEM_160523I** SeqNo: **3841919** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	0.1131	0.025	0.1	0	113	91-143	0			

MS Sample ID: **1605959-01B MS** Units: **% by wt** Analysis Date: **5/23/2016 12:10 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **WETCHEM_160523I** SeqNo: **3841921** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	1.134	0.025	0.3968	0.6284	127	91-143	0			

MSD Sample ID: **1605959-01B MSD** Units: **% by wt** Analysis Date: **5/23/2016 12:10 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **WETCHEM_160523I** SeqNo: **3841922** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	1.116	0.025	0.4132	0.6284	118	91-143	1.134	1.57	20	

The following samples were analyzed in this batch:

1605959-01B	1605959-02B	1605959-03B
1605959-04B	1605959-05B	1605959-06B
1605959-07B	1605959-08B	1605959-09B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

HULL

CHAIN OF CUSTODY RECORD

16005959

PAGE 1 OF 1

NO. 0018

Dublin, OH	Indianapolis, IN	Mason, OH	Bedford, OH	Toledo, OH	St. Clairsville, OH	Pittsburgh, PA
6397 Emerald Pkwy	8445 Keystone Crossing	4770 Duke Dr.	4 Hemisphere Way	3401 Glendale Ave.	146 W. Main St.	Campbells Run Business Center
Suite 200	Suite 135	Suite 300	Bedford, OH 44146	Suite 300	2nd Floor	300 Business Center Dr., Suite 320
Dublin, OH 43016	Indianapolis, IN 46240	Mason, OH 45040	P: (440) 232-9945	Toledo, OH 43614	St. Clairsville, OH 43950	Pittsburgh, PA 15205
P: (614) 793-8777	P: (800) 241-7173	P: (513) 459-9677		P: (419) 385-2018	P: (800) 241-7173	P: (412) 446-0315

REPORT TO: Matt Bell

Client: Rocky Ridge Development

Site: Rocky Ridge

Project #: RCK001 Phase:

Samplers: J. Maniaci

Purchase Order #

SAMPLE MATRIX
AA-AMBIENT AIR
C-ASBESTOS
D-SEDIMENT
G-GROUNDWATER
IA-INDOOR AIR
L-LEACHATE
P-PRODUCT
S-SOIL
SG-SOIL GAS
SS-SUBSLAB
VAPOR
W-WATER
X-CONCRETE

PRESERVATIVES
A-Cool only, <4 deg. C
B-HNO_3 pH<2
C-H_2SO_4 pH<2
D-NaOH pH>12
E-ZnAcetate + NaOH, pH>9
F-$Na_2S_2O_3$ (0.008%)
G-HCL pH <2
H-EDTA
I-5ml 1:1 HCL
J-none
K-Stored in dark
L-NH_4Cl
M-Methanol
S-Sodium

METALS
N - Not filtered
F45u- filtered with 0.45 micron
F5u- filtered with 5 micron

ANALYSES / PRESERVATIVES

PROJECT NO. : SAMPLE LOCATION : SAMPLE MATRIX & ID	NO. OF CONT.	SAMPLE TYPE (discrete, composite)	COLLECTION DATE/TIME	METALS	COMMENTS
RCK001 : 50/50 : S B16-1160	9	Composite	05162016 / 12:30		
RCK001 : 66/33 : S B16-1161	9	Composite	05162016 / 13:00		
RCK001 : 33/66 : S B16-1162	15	Composite	05162016 / 13:30		
: :			/		
: :			/		
: :			/		
: :			/		
: :			/		
: :			/		
: :			/		
: :			/		
: :			/		

RELINQUISHED BY:	DATE: 5/16/16	RECEIVED BY:	DATE: 5/17/16
	TIME: 4:00pm		TIME: 900
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:		TIME:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:		TIME:

Deliver To: ALS

Method of Delivery: Fed EX

Airbill Number:

Regulatory Program:

Required Limits:

COOLER TEMPERATURE AS RECEIVED: 3.0 °C

DISTRIBUTION: WHITE -LAB USE (MUST BE RETURNED WITH REPORT); YELLOW -LAB USE; PINK -RETAINED BY HULL

NOTES:

TURN AROUND TIME: _____ DAYS

ORIGIN ID:LNNA (000) 000-0000
JX MANIACI
HULL & ASSOCIATES
4 HEMISPHERE WAY
STE D
BEDFORD, OH 44146
UNITED STATES US

SHIP DATE: 16MAY16
ACTWGT: 35.50 LB
CAD: 6991623/SSFD1704
DIMS: 23x14x14 IN

BILL THIRD PARTY

TO LABORATORY RECIEVING
ALS GLOBAL
3552 128TH AVE

HOLLAND MI 49424
(000) 000-0000 REF:
INV:
PO: DEPT:

Fe

CUSTODY SEAL
SIGNATURE
QEC
Quality Environmental

1 of 2
TRK# 0201 7830 8784 9835
MASTER
NA HLMA

TUE - 17 MAY
STANDARD OVER

49424
MI-US GRR

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **HULL&ASSOC-TOLEDO** Date/Time Received: **17-May-16 00:00**

Work Order: **1605959** Received by: **MEB**

Checklist completed by Meghan Broadbent eSignature 17-May-16 Date Reviewed by: Bill Carey eSignature 19-May-16 Date

Matrices: soil
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.0/3.0	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	5/17/2016 3:22:34 PM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

09-May-2016

Matt Beil
Hull & Associates, Inc.
3401 Glendale Ave
Suite 300
Toledo, OH 43614

Re: **RCK001 Lagoon E** Work Order: **16041611**

Dear Matt,

ALS Environmental received 3 samples on 28-Apr-2016 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 58.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Certificate No: OH: CL 103

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

ALS Group USA, Corp

Date: 09-May-16

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Work Order: **16041611**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
16041611-01	RCK001:E1:D000180	Soil	E1	4/26/2016 16:30	4/28/2016 09:30	☐
16041611-02	RCK001:E2:D000160	Soil	E2	4/26/2016 16:30	4/28/2016 09:30	☐
16041611-03	RCK001:E3:D000160	Soil	E3	4/26/2016 16:30	4/28/2016 09:30	☐

ALS Group USA, Corp

Date: 09-May-16

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
WorkOrder: **16041611**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and PQL, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
% of sample	Percent of Sample
µg/Kg-dry	Micrograms per Kilogram Dry Weight
mg/Kg-dry	Milligrams per Kilogram Dry Weight
s.u.	Standard Units

ALS Group USA, Corp

Date: 09-May-16

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Work Order: 16041611

Case Narrative

Samples for the above noted Work Order were received on 4/28/2016. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

With the following exceptions, all sample analyses achieved analytical criteria.

Volatile Organics:
No other deviations or anomalies were noted.

Extractable Organics:
No other deviations or anomalies were noted.

Metals:
No other deviations or anomalies were noted.

Wet Chemistry:
No other deviations or anomalies were noted.

ALS Group USA, Corp

Date: *09-May-16*

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E1:D000180
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 5/2/16		Analyst: **EB**
Aroclor 1016	U		130	1,100	µg/Kg-dry	1	5/3/2016 00:59
Aroclor 1221	U		130	1,100	µg/Kg-dry	1	5/3/2016 00:59
Aroclor 1232	U		130	1,100	µg/Kg-dry	1	5/3/2016 00:59
Aroclor 1242	U		130	1,100	µg/Kg-dry	1	5/3/2016 00:59
Aroclor 1248	U		130	1,100	µg/Kg-dry	1	5/3/2016 00:59
Aroclor 1254	U		170	1,100	µg/Kg-dry	1	5/3/2016 00:59
Aroclor 1260	U		170	1,100	µg/Kg-dry	1	5/3/2016 00:59
Surr: Decachlorobiphenyl	*79.1*			*40-140*	*%REC*	1	5/3/2016 00:59
Surr: Tetrachloro-m-xylene	*71.1*			*45-124*	*%REC*	1	5/3/2016 00:59
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 5/2/16		Analyst: **BLM**
4,4´-DDD	U		36	270	µg/Kg-dry	2	5/2/2016 17:49
4,4´-DDE	U		56	270	µg/Kg-dry	2	5/2/2016 17:49
4,4´-DDT	U		49	270	µg/Kg-dry	2	5/2/2016 17:49
Aldrin	U		42	270	µg/Kg-dry	2	5/2/2016 17:49
alpha-BHC	U		28	270	µg/Kg-dry	2	5/2/2016 17:49
alpha-Chlordane	U		46	270	µg/Kg-dry	2	5/2/2016 17:49
beta-BHC	U		96	270	µg/Kg-dry	2	5/2/2016 17:49
Chlordane, Technical	U		200	680	µg/Kg-dry	2	5/2/2016 17:49
delta-BHC	U		42	270	µg/Kg-dry	2	5/2/2016 17:49
Dieldrin	U		57	270	µg/Kg-dry	2	5/2/2016 17:49
Endosulfan I	U		36	270	µg/Kg-dry	2	5/2/2016 17:49
Endosulfan II	U		61	270	µg/Kg-dry	2	5/2/2016 17:49
Endosulfan sulfate	U		48	270	µg/Kg-dry	2	5/2/2016 17:49
Endrin	U		46	270	µg/Kg-dry	2	5/2/2016 17:49
Endrin aldehyde	U		110	270	µg/Kg-dry	2	5/2/2016 17:49
gamma-BHC (Lindane)	U		38	270	µg/Kg-dry	2	5/2/2016 17:49
Heptachlor	U		42	270	µg/Kg-dry	2	5/2/2016 17:49
Heptachlor epoxide	U		38	270	µg/Kg-dry	2	5/2/2016 17:49
Toxaphene	U		200	1,600	µg/Kg-dry	2	5/2/2016 17:49
Surr: Decachlorobiphenyl	*104*			*45-135*	*%REC*	2	5/2/2016 17:49
Surr: Tetrachloro-m-xylene	*82.1*			*45-124*	*%REC*	2	5/2/2016 17:49
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 5/3/16		Analyst: **LR**
Mercury	**0.032**	J	**0.0082**	**0.096**	**mg/Kg-dry**	1	5/3/2016 16:14
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/2/16		Analyst: **ML**
Magnesium	**38,000**		**29**	**1,000**	**mg/Kg-dry**	10	5/3/2016 05:11
Potassium	**800**	J	**180**	**1,000**	**mg/Kg-dry**	10	5/3/2016 05:11
Sodium	**330**	J	**110**	**1,000**	**mg/Kg-dry**	10	5/3/2016 05:11

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-May-16*

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E1:D000180
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/2/16		Analyst: **ML**
Antimony	U		0.31	26	mg/Kg-dry	10	5/3/2016 05:11
Arsenic	**4.5**	J	**4.0**	**26**	**mg/Kg-dry**	10	5/3/2016 05:11
Beryllium	U		0.41	10	mg/Kg-dry	10	5/3/2016 05:11
Cadmium	U		0.41	10	mg/Kg-dry	10	5/3/2016 05:11
Chromium	**7.0**	J	**4.1**	**26**	**mg/Kg-dry**	10	5/3/2016 05:11
Copper	**9.8**	J	**1.3**	**26**	**mg/Kg-dry**	10	5/3/2016 05:11
Lead	**4.6**	J	**0.62**	**26**	**mg/Kg-dry**	10	5/3/2016 05:11
Nickel	**13**	J	**4.5**	**26**	**mg/Kg-dry**	10	5/3/2016 05:11
Selenium	U		4.0	26	mg/Kg-dry	10	5/3/2016 05:11
Silver	U		0.73	26	mg/Kg-dry	10	5/3/2016 05:11
Thallium	U		0.73	26	mg/Kg-dry	10	5/3/2016 05:11
Zinc	**44**	J	**10**	**52**	**mg/Kg-dry**	10	5/3/2016 05:11
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 5/3/16		Analyst: **RM**
1,2-Diphenylhydrazine	U		33	640	µg/Kg-dry	1	5/4/2016 01:39
2,4,6-Trichlorophenol	U		170	640	µg/Kg-dry	1	5/4/2016 01:39
2,4-Dichlorophenol	U		140	640	µg/Kg-dry	1	5/4/2016 01:39
2,4-Dimethylphenol	U		130	640	µg/Kg-dry	1	5/4/2016 01:39
2,4-Dinitrophenol	U		350	640	µg/Kg-dry	1	5/4/2016 01:39
2,4-Dinitrotoluene	U		170	640	µg/Kg-dry	1	5/4/2016 01:39
2,6-Dinitrotoluene	U		110	640	µg/Kg-dry	1	5/4/2016 01:39
2-Chloronaphthalene	U		90	130	µg/Kg-dry	1	5/4/2016 01:39
2-Chlorophenol	U		200	640	µg/Kg-dry	1	5/4/2016 01:39
2-Nitrophenol	U		180	640	µg/Kg-dry	1	5/4/2016 01:39
3,3´-Dichlorobenzidine	U		96	3,200	µg/Kg-dry	1	5/4/2016 01:39
4,6-Dinitro-2-methylphenol	U		160	640	µg/Kg-dry	1	5/4/2016 01:39
4-Bromophenyl phenyl ether	U		170	640	µg/Kg-dry	1	5/4/2016 01:39
4-Chloro-3-methylphenol	U		180	640	µg/Kg-dry	1	5/4/2016 01:39
4-Chlorophenyl phenyl ether	U		180	640	µg/Kg-dry	1	5/4/2016 01:39
4-Nitrophenol	U		580	640	µg/Kg-dry	1	5/4/2016 01:39
Acenaphthene	U		93	130	µg/Kg-dry	1	5/4/2016 01:39
Acenaphthylene	U		110	130	µg/Kg-dry	1	5/4/2016 01:39
Anthracene	U		91	130	µg/Kg-dry	1	5/4/2016 01:39
Benzidine	U		5,000	13,000	µg/Kg-dry	1	5/4/2016 01:39
Benzo(a)anthracene	U		110	130	µg/Kg-dry	1	5/4/2016 01:39
Benzo(a)pyrene	U		79	130	µg/Kg-dry	1	5/4/2016 01:39
Benzo(b)fluoranthene	U		96	130	µg/Kg-dry	1	5/4/2016 01:39
Benzo(g,h,i)perylene	U		99	130	µg/Kg-dry	1	5/4/2016 01:39
Benzo(k)fluoranthene	U		98	130	µg/Kg-dry	1	5/4/2016 01:39

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E1:D000180
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		62	640	µg/Kg-dry	1	5/4/2016 01:39
Bis(2-chloroethyl)ether	U		180	640	µg/Kg-dry	1	5/4/2016 01:39
Bis(2-chloroisopropyl)ether	U		150	640	µg/Kg-dry	1	5/4/2016 01:39
Bis(2-ethylhexyl)phthalate	U		110	640	µg/Kg-dry	1	5/4/2016 01:39
Butyl benzyl phthalate	U		110	640	µg/Kg-dry	1	5/4/2016 01:39
Chrysene	U		100	130	µg/Kg-dry	1	5/4/2016 01:39
Dibenzo(a,h)anthracene	U		70	130	µg/Kg-dry	1	5/4/2016 01:39
Diethyl phthalate	U		99	640	µg/Kg-dry	1	5/4/2016 01:39
Dimethyl phthalate	U		130	640	µg/Kg-dry	1	5/4/2016 01:39
Di-n-butyl phthalate	U		120	640	µg/Kg-dry	1	5/4/2016 01:39
Di-n-octyl phthalate	U		120	640	µg/Kg-dry	1	5/4/2016 01:39
Fluoranthene	U		62	130	µg/Kg-dry	1	5/4/2016 01:39
Fluorene	U		94	130	µg/Kg-dry	1	5/4/2016 01:39
Hexachlorobenzene	U		190	640	µg/Kg-dry	1	5/4/2016 01:39
Hexachlorobutadiene	U		350	640	µg/Kg-dry	1	5/4/2016 01:39
Hexachlorocyclopentadiene	U		220	640	µg/Kg-dry	1	5/4/2016 01:39
Hexachloroethane	U		270	640	µg/Kg-dry	1	5/4/2016 01:39
Indeno(1,2,3-cd)pyrene	U		90	130	µg/Kg-dry	1	5/4/2016 01:39
Isophorone	U		130	3,200	µg/Kg-dry	1	5/4/2016 01:39
Naphthalene	U		83	130	µg/Kg-dry	1	5/4/2016 01:39
Nitrobenzene	U		220	3,200	µg/Kg-dry	1	5/4/2016 01:39
N-Nitrosodimethylamine	U		210	3,200	µg/Kg-dry	1	5/4/2016 01:39
N-Nitrosodi-n-propylamine	U		110	640	µg/Kg-dry	1	5/4/2016 01:39
N-Nitrosodiphenylamine	U		62	640	µg/Kg-dry	1	5/4/2016 01:39
Pentachlorophenol	U		240	640	µg/Kg-dry	1	5/4/2016 01:39
Phenanthrene	U		60	130	µg/Kg-dry	1	5/4/2016 01:39
Phenol	**2,700**		**160**	**640**	**µg/Kg-dry**	1	5/4/2016 01:39
Pyrene	U		23	130	µg/Kg-dry	1	5/4/2016 01:39
Surr: 2,4,6-Tribromophenol	*78.9*			*34-140*	*%REC*	1	5/4/2016 01:39
Surr: 2-Fluorobiphenyl	*80.7*			*12-100*	*%REC*	1	5/4/2016 01:39
Surr: 2-Fluorophenol	*83.8*			*33-117*	*%REC*	1	5/4/2016 01:39
Surr: 4-Terphenyl-d14	*85.3*			*25-137*	*%REC*	1	5/4/2016 01:39
Surr: Nitrobenzene-d5	*93.1*			*37-107*	*%REC*	1	5/4/2016 01:39
Surr: Phenol-d6	*83.9*			*40-106*	*%REC*	1	5/4/2016 01:39
VOLATILE ORGANICS - METHANOL CORRECTED		Method:	**SW8260B**		Prep: SW5035 / 4/29/16		Analyst: **LSY**
1,1,1-Trichloroethane	U		120	430	µg/Kg-dry	1	5/7/2016 01:04
1,1,2,2-Tetrachloroethane	U		100	430	µg/Kg-dry	1	5/7/2016 01:04
1,1,2-Trichloroethane	U		130	430	µg/Kg-dry	1	5/7/2016 01:04
1,1-Dichloroethane	U		110	430	µg/Kg-dry	1	5/7/2016 01:04

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-May-16*

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E1:D000180
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		120	430	µg/Kg-dry	1	5/7/2016 01:04
1,2-Dichlorobenzene	U		130	430	µg/Kg-dry	1	5/7/2016 01:04
1,2-Dichloroethane	U		120	430	µg/Kg-dry	1	5/7/2016 01:04
1,2-Dichloropropane	U		120	430	µg/Kg-dry	1	5/7/2016 01:04
1,3-Dichlorobenzene	U		140	430	µg/Kg-dry	1	5/7/2016 01:04
1,4-Dichlorobenzene	U		110	430	µg/Kg-dry	1	5/7/2016 01:04
Acrolein	U		1,300	2,900	µg/Kg-dry	1	5/7/2016 01:04
Acrylonitrile	U		360	1,400	µg/Kg-dry	1	5/7/2016 01:04
Benzene	U		98	430	µg/Kg-dry	1	5/7/2016 01:04
Bromodichloromethane	U		120	430	µg/Kg-dry	1	5/7/2016 01:04
Bromoform	U		150	430	µg/Kg-dry	1	5/7/2016 01:04
Bromomethane	U		190	1,100	µg/Kg-dry	1	5/7/2016 01:04
Carbon tetrachloride	U		77	430	µg/Kg-dry	1	5/7/2016 01:04
Chlorobenzene	U		130	430	µg/Kg-dry	1	5/7/2016 01:04
Chloroethane	U		270	1,400	µg/Kg-dry	1	5/7/2016 01:04
Chloroform	U		150	430	µg/Kg-dry	1	5/7/2016 01:04
Chloromethane	U		170	1,400	µg/Kg-dry	1	5/7/2016 01:04
cis-1,2-Dichloroethene	U		120	430	µg/Kg-dry	1	5/7/2016 01:04
cis-1,3-Dichloropropene	U		170	430	µg/Kg-dry	1	5/7/2016 01:04
Dibromochloromethane	U		98	430	µg/Kg-dry	1	5/7/2016 01:04
Ethylbenzene	U		100	430	µg/Kg-dry	1	5/7/2016 01:04
Methylene chloride	U		200	430	µg/Kg-dry	1	5/7/2016 01:04
Tetrachloroethene	U		210	430	µg/Kg-dry	1	5/7/2016 01:04
Toluene	U		140	430	µg/Kg-dry	1	5/7/2016 01:04
trans-1,2-Dichloroethene	U		120	430	µg/Kg-dry	1	5/7/2016 01:04
trans-1,3-Dichloropropene	U		77	430	µg/Kg-dry	1	5/7/2016 01:04
Trichloroethene	U		120	430	µg/Kg-dry	1	5/7/2016 01:04
Vinyl chloride	U		140	430	µg/Kg-dry	1	5/7/2016 01:04
Surr: 1,2-Dichloroethane-d4	*105*			*70-130*	*%REC*	1	5/7/2016 01:04
Surr: 4-Bromofluorobenzene	*89.6*			*70-130*	*%REC*	1	5/7/2016 01:04
Surr: Dibromofluoromethane	*96.6*			*70-130*	*%REC*	1	5/7/2016 01:04
Surr: Toluene-d8	*97.0*			*70-130*	*%REC*	1	5/7/2016 01:04
BIOCHEMICAL OXYGEN DEMAND		Method:	**A5210B-97**		Prep: A5210B / 4/29/16		Analyst: **JRF**
Biochemical Oxygen Demand	**500**		**76**	**76**	**mg/Kg-dry**	1	5/4/2016 10:00
CHLORIDE		Method:	**A4500-CL E-97**		Prep: EXTRACT / 5/2/16		Analyst: **ED**
Chloride	**160**		**8.3**	**76**	**mg/Kg-dry**	1	5/3/2016 14:00
CYANIDE, TOTAL		Method:	**SW9012B**		Prep: SW9012B / 5/2/16		Analyst: **JB**
Cyanide, Total	U		0.073	3.3	mg/Kg-dry	1	5/2/2016 15:09

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-May-16*

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E1:D000180
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-01
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND		Method: **E410.4 R2.0**			Prep: EXTRACT / 5/4/16		Analyst: **JJG**
Chemical Oxygen Demand	U		1,000	5,700	mg/Kg-dry	1	5/5/2016 09:30
MOISTURE		Method: **SW3550C**					Analyst: **LW**
Moisture	**87**		**0.025**	**0.050**	**% of sample**	1	4/29/2016 18:30
NITROGEN, TOTAL		Method: **CALCULATION**					Analyst: **JB**
Nitrogen, Total	**1,500**		**0**	**7.6**	**mg/Kg-dry**	1	5/3/2016 10:00
AMMONIA AS NITROGEN		Method: **A4500-NH3 G-97**					Analyst: **JJG**
Ammonia as Nitrogen	**310**		**44**	**150**	**mg NH3-N/Kg-dry**	1	5/4/2016 11:54
NITROGEN, NITRITE		Method: **A4500-NO2 B**			Prep: EXTRACT / 4/29/16		Analyst: **JB**
Nitrogen, Nitrite	U		0.056	4.9	mg/Kg-dry	1	5/2/2016 12:00
NITROGEN, NITRATE		Method: **E353.2**			Prep: EXTRACT / 4/29/16		Analyst: **JJG**
Nitrogen, Nitrate	**3.0**	J	**0.34**	**7.0**	**mg/Kg-dry**	1	5/2/2016 11:46
NITROGEN, NITRATE-NITRITE		Method: **E353.2**			Prep: EXTRACT / 4/29/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**3.2**	J	**0.54**	**7.0**	**mg/Kg-dry**	1	5/2/2016 11:46
NITROGEN, TOTAL INORGANIC		Method: **CALCULATION**					Analyst: **JB**
Nitrogen, Total Inorganic	**310**		**0**	**0.15**	**mg/Kg-dry**	1	5/5/2016 08:00
NITROGEN, TOTAL ORGANIC		Method: **CALCULATION**					Analyst: **JB**
Nitrogen, Total Organic	**1,200**		**7.6**	**7.6**	**mg/Kg-dry**	1	5/5/2016 08:00
PHOSPHORUS, TOTAL		Method: **E365.1 R2.0**			Prep: E365.1 R2.0 / 5/2/16		Analyst: **JJG**
Phosphorus, Total	**300**		**48**	**200**	**mg/Kg-dry**	5	5/3/2016 10:52
PH		Method: **SW9045D**			Prep: EXTRACT / 5/2/16		Analyst: **STP**
pH	**9.4**		**0**		**s.u.**	1	5/2/2016 16:30
PHOSPHORUS, ORTHO-P (AS P)		Method: **A4500-P E-97**			Prep: E365.1 R2.0 / 4/29/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	U		4.4	9.3	mg/Kg-dry	1	4/29/2016 15:56
NITROGEN, TOTAL KJELDAHL		Method: **A4500-NH3 G-97**			Prep: A4500-N B / 4/29/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**1,500**		**71**	**150**	**mg/Kg-dry**	1	5/2/2016 13:22
ORGANIC CARBON - WALKLEY-BLACK		Method: **TITRAMETRIC**					Analyst: **KF**
Organic Carbon - W-B	**3.5**		**0.091**	**0.19**	**% by wt-dry**	1	4/29/2016 09:33

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-May-16*

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E2:D000160
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 5/2/16		Analyst: **EB**
Aroclor 1016	U		71	610	µg/Kg-dry	1	5/3/2016 01:16
Aroclor 1221	U		71	610	µg/Kg-dry	1	5/3/2016 01:16
Aroclor 1232	U		71	610	µg/Kg-dry	1	5/3/2016 01:16
Aroclor 1242	U		71	610	µg/Kg-dry	1	5/3/2016 01:16
Aroclor 1248	U		71	610	µg/Kg-dry	1	5/3/2016 01:16
Aroclor 1254	U		90	610	µg/Kg-dry	1	5/3/2016 01:16
Aroclor 1260	U		90	610	µg/Kg-dry	1	5/3/2016 01:16
Surr: Decachlorobiphenyl	*82.1*			*40-140*	*%REC*	1	5/3/2016 01:16
Surr: Tetrachloro-m-xylene	*70.1*			*45-124*	*%REC*	1	5/3/2016 01:16
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 5/2/16		Analyst: **BLM**
4,4´-DDD	U		19	150	µg/Kg-dry	2	5/2/2016 18:21
4,4´-DDE	U		30	150	µg/Kg-dry	2	5/2/2016 18:21
4,4´-DDT	U		26	150	µg/Kg-dry	2	5/2/2016 18:21
Aldrin	U		23	150	µg/Kg-dry	2	5/2/2016 18:21
alpha-BHC	U		15	150	µg/Kg-dry	2	5/2/2016 18:21
alpha-Chlordane	U		25	150	µg/Kg-dry	2	5/2/2016 18:21
beta-BHC	U		52	150	µg/Kg-dry	2	5/2/2016 18:21
Chlordane, Technical	U		110	360	µg/Kg-dry	2	5/2/2016 18:21
delta-BHC	U		23	150	µg/Kg-dry	2	5/2/2016 18:21
Dieldrin	U		30	150	µg/Kg-dry	2	5/2/2016 18:21
Endosulfan I	U		19	150	µg/Kg-dry	2	5/2/2016 18:21
Endosulfan II	U		33	150	µg/Kg-dry	2	5/2/2016 18:21
Endosulfan sulfate	U		26	150	µg/Kg-dry	2	5/2/2016 18:21
Endrin	U		25	150	µg/Kg-dry	2	5/2/2016 18:21
Endrin aldehyde	U		59	150	µg/Kg-dry	2	5/2/2016 18:21
gamma-BHC (Lindane)	U		20	150	µg/Kg-dry	2	5/2/2016 18:21
Heptachlor	U		23	150	µg/Kg-dry	2	5/2/2016 18:21
Heptachlor epoxide	U		20	150	µg/Kg-dry	2	5/2/2016 18:21
Toxaphene	U		110	870	µg/Kg-dry	2	5/2/2016 18:21
Surr: Decachlorobiphenyl	*102*			*45-135*	*%REC*	2	5/2/2016 18:21
Surr: Tetrachloro-m-xylene	*80.1*			*45-124*	*%REC*	2	5/2/2016 18:21
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 5/3/16		Analyst: **LR**
Mercury	**0.024**	J	**0.0066**	**0.078**	**mg/Kg-dry**	1	5/3/2016 16:27
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/2/16		Analyst: **ML**
Magnesium	**30,000**		**26**	**930**	**mg/Kg-dry**	10	5/3/2016 05:17
Potassium	**940**	J	**160**	**930**	**mg/Kg-dry**	10	5/3/2016 05:17
Sodium	**300**	J	**95**	**930**	**mg/Kg-dry**	10	5/3/2016 05:17

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-May-16*

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E2:D000160
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/2/16		Analyst: **ML**
Antimony	U		0.28	23	mg/Kg-dry	10	5/3/2016 05:17
Arsenic	**4.7**	J	**3.6**	**23**	**mg/Kg-dry**	10	5/3/2016 05:17
Beryllium	U		0.37	9.3	mg/Kg-dry	10	5/3/2016 05:17
Cadmium	U		0.37	9.3	mg/Kg-dry	10	5/3/2016 05:17
Chromium	**5.9**	J	**3.7**	**23**	**mg/Kg-dry**	10	5/3/2016 05:17
Copper	**9.4**	J	**1.2**	**23**	**mg/Kg-dry**	10	5/3/2016 05:17
Lead	**4.1**	J	**0.56**	**23**	**mg/Kg-dry**	10	5/3/2016 05:17
Nickel	**11**	J	**4.0**	**23**	**mg/Kg-dry**	10	5/3/2016 05:17
Selenium	U		3.6	23	mg/Kg-dry	10	5/3/2016 05:17
Silver	U		0.65	23	mg/Kg-dry	10	5/3/2016 05:17
Thallium	U		0.65	23	mg/Kg-dry	10	5/3/2016 05:17
Zinc	**27**	J	**9.3**	**47**	**mg/Kg-dry**	10	5/3/2016 05:17
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 5/3/16		Analyst: **RM**
1,2-Diphenylhydrazine	U		30	580	µg/Kg-dry	1	5/4/2016 01:59
2,4,6-Trichlorophenol	U		160	580	µg/Kg-dry	1	5/4/2016 01:59
2,4-Dichlorophenol	U		120	580	µg/Kg-dry	1	5/4/2016 01:59
2,4-Dimethylphenol	U		120	580	µg/Kg-dry	1	5/4/2016 01:59
2,4-Dinitrophenol	U		320	580	µg/Kg-dry	1	5/4/2016 01:59
2,4-Dinitrotoluene	U		150	580	µg/Kg-dry	1	5/4/2016 01:59
2,6-Dinitrotoluene	U		97	580	µg/Kg-dry	1	5/4/2016 01:59
2-Chloronaphthalene	U		82	120	µg/Kg-dry	1	5/4/2016 01:59
2-Chlorophenol	U		180	580	µg/Kg-dry	1	5/4/2016 01:59
2-Nitrophenol	U		170	580	µg/Kg-dry	1	5/4/2016 01:59
3,3´-Dichlorobenzidine	U		87	2,900	µg/Kg-dry	1	5/4/2016 01:59
4,6-Dinitro-2-methylphenol	U		150	580	µg/Kg-dry	1	5/4/2016 01:59
4-Bromophenyl phenyl ether	U		160	580	µg/Kg-dry	1	5/4/2016 01:59
4-Chloro-3-methylphenol	U		170	580	µg/Kg-dry	1	5/4/2016 01:59
4-Chlorophenyl phenyl ether	U		160	580	µg/Kg-dry	1	5/4/2016 01:59
4-Nitrophenol	U		520	580	µg/Kg-dry	1	5/4/2016 01:59
Acenaphthene	**110**	J	**85**	**120**	**µg/Kg-dry**	1	5/4/2016 01:59
Acenaphthylene	U		100	120	µg/Kg-dry	1	5/4/2016 01:59
Anthracene	**220**		**82**	**120**	**µg/Kg-dry**	1	5/4/2016 01:59
Benzidine	U		4,500	12,000	µg/Kg-dry	1	5/4/2016 01:59
Benzo(a)anthracene	**290**		**100**	**120**	**µg/Kg-dry**	1	5/4/2016 01:59
Benzo(a)pyrene	**330**		**72**	**120**	**µg/Kg-dry**	1	5/4/2016 01:59
Benzo(b)fluoranthene	**400**		**87**	**120**	**µg/Kg-dry**	1	5/4/2016 01:59
Benzo(g,h,i)perylene	**190**		**90**	**120**	**µg/Kg-dry**	1	5/4/2016 01:59
Benzo(k)fluoranthene	**160**		**89**	**120**	**µg/Kg-dry**	1	5/4/2016 01:59

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-May-16*

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E2:D000160
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		56	580	µg/Kg-dry	1	5/4/2016 01:59
Bis(2-chloroethyl)ether	U		170	580	µg/Kg-dry	1	5/4/2016 01:59
Bis(2-chloroisopropyl)ether	U		140	580	µg/Kg-dry	1	5/4/2016 01:59
Bis(2-ethylhexyl)phthalate	U		100	580	µg/Kg-dry	1	5/4/2016 01:59
Butyl benzyl phthalate	U		99	580	µg/Kg-dry	1	5/4/2016 01:59
Chrysene	**300**		**95**	**120**	**µg/Kg-dry**	1	5/4/2016 01:59
Dibenzo(a,h)anthracene	U		63	120	µg/Kg-dry	1	5/4/2016 01:59
Diethyl phthalate	U		90	580	µg/Kg-dry	1	5/4/2016 01:59
Dimethyl phthalate	U		110	580	µg/Kg-dry	1	5/4/2016 01:59
Di-n-butyl phthalate	U		110	580	µg/Kg-dry	1	5/4/2016 01:59
Di-n-octyl phthalate	U		110	580	µg/Kg-dry	1	5/4/2016 01:59
Fluoranthene	U		56	120	µg/Kg-dry	1	5/4/2016 01:59
Fluorene	**130**		**85**	**120**	**µg/Kg-dry**	1	5/4/2016 01:59
Hexachlorobenzene	U		170	580	µg/Kg-dry	1	5/4/2016 01:59
Hexachlorobutadiene	U		320	580	µg/Kg-dry	1	5/4/2016 01:59
Hexachlorocyclopentadiene	U		200	580	µg/Kg-dry	1	5/4/2016 01:59
Hexachloroethane	U		240	580	µg/Kg-dry	1	5/4/2016 01:59
Indeno(1,2,3-cd)pyrene	**220**		**81**	**120**	**µg/Kg-dry**	1	5/4/2016 01:59
Isophorone	U		110	2,900	µg/Kg-dry	1	5/4/2016 01:59
Naphthalene	**120**	J	**75**	**120**	**µg/Kg-dry**	1	5/4/2016 01:59
Nitrobenzene	U		200	2,900	µg/Kg-dry	1	5/4/2016 01:59
N-Nitrosodimethylamine	U		190	2,900	µg/Kg-dry	1	5/4/2016 01:59
N-Nitrosodi-n-propylamine	U		97	580	µg/Kg-dry	1	5/4/2016 01:59
N-Nitrosodiphenylamine	U		56	580	µg/Kg-dry	1	5/4/2016 01:59
Pentachlorophenol	U		220	580	µg/Kg-dry	1	5/4/2016 01:59
Phenanthrene	**1,300**		**54**	**120**	**µg/Kg-dry**	1	5/4/2016 01:59
Phenol	**2,400**		**150**	**580**	**µg/Kg-dry**	1	5/4/2016 01:59
Pyrene	**710**		**21**	**120**	**µg/Kg-dry**	1	5/4/2016 01:59
Surr: 2,4,6-Tribromophenol	*74.3*			*34-140*	*%REC*	1	5/4/2016 01:59
Surr: 2-Fluorobiphenyl	*70.1*			*12-100*	*%REC*	1	5/4/2016 01:59
Surr: 2-Fluorophenol	*74.0*			*33-117*	*%REC*	1	5/4/2016 01:59
Surr: 4-Terphenyl-d14	*78.1*			*25-137*	*%REC*	1	5/4/2016 01:59
Surr: Nitrobenzene-d5	*78.5*			*37-107*	*%REC*	1	5/4/2016 01:59
Surr: Phenol-d6	*74.9*			*40-106*	*%REC*	1	5/4/2016 01:59
VOLATILE ORGANICS - METHANOL CORRECTED		Method: **SW8260B**			Prep: SW5035 / 4/29/16		Analyst: **LSY**
1,1,1-Trichloroethane	U		100	350	µg/Kg-dry	1	5/7/2016 01:29
1,1,2,2-Tetrachloroethane	U		85	350	µg/Kg-dry	1	5/7/2016 01:29
1,1,2-Trichloroethane	U		110	350	µg/Kg-dry	1	5/7/2016 01:29
1,1-Dichloroethane	U		89	350	µg/Kg-dry	1	5/7/2016 01:29

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-May-16*

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E2:D000160
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		94	350	µg/Kg-dry	1	5/7/2016 01:29
1,2-Dichlorobenzene	U		100	350	µg/Kg-dry	1	5/7/2016 01:29
1,2-Dichloroethane	U		96	350	µg/Kg-dry	1	5/7/2016 01:29
1,2-Dichloropropane	U		97	350	µg/Kg-dry	1	5/7/2016 01:29
1,3-Dichlorobenzene	U		110	350	µg/Kg-dry	1	5/7/2016 01:29
1,4-Dichlorobenzene	U		92	350	µg/Kg-dry	1	5/7/2016 01:29
Acrolein	U		1,100	2,300	µg/Kg-dry	1	5/7/2016 01:29
Acrylonitrile	U		300	1,200	µg/Kg-dry	1	5/7/2016 01:29
Benzene	U		79	350	µg/Kg-dry	1	5/7/2016 01:29
Bromodichloromethane	U		94	350	µg/Kg-dry	1	5/7/2016 01:29
Bromoform	U		120	350	µg/Kg-dry	1	5/7/2016 01:29
Bromomethane	U		150	880	µg/Kg-dry	1	5/7/2016 01:29
Carbon tetrachloride	U		62	350	µg/Kg-dry	1	5/7/2016 01:29
Chlorobenzene	U		110	350	µg/Kg-dry	1	5/7/2016 01:29
Chloroethane	U		220	1,200	µg/Kg-dry	1	5/7/2016 01:29
Chloroform	U		120	350	µg/Kg-dry	1	5/7/2016 01:29
Chloromethane	U		140	1,200	µg/Kg-dry	1	5/7/2016 01:29
cis-1,2-Dichloroethene	U		99	350	µg/Kg-dry	1	5/7/2016 01:29
cis-1,3-Dichloropropene	U		130	350	µg/Kg-dry	1	5/7/2016 01:29
Dibromochloromethane	U		80	350	µg/Kg-dry	1	5/7/2016 01:29
Ethylbenzene	U		82	350	µg/Kg-dry	1	5/7/2016 01:29
Methylene chloride	**520**		**160**	**350**	**µg/Kg-dry**	1	5/7/2016 01:29
Tetrachloroethene	U		170	350	µg/Kg-dry	1	5/7/2016 01:29
Toluene	U		120	350	µg/Kg-dry	1	5/7/2016 01:29
trans-1,2-Dichloroethene	U		99	350	µg/Kg-dry	1	5/7/2016 01:29
trans-1,3-Dichloropropene	U		63	350	µg/Kg-dry	1	5/7/2016 01:29
Trichloroethene	U		94	350	µg/Kg-dry	1	5/7/2016 01:29
Vinyl chloride	U		110	350	µg/Kg-dry	1	5/7/2016 01:29
Surr: 1,2-Dichloroethane-d4	*106*			*70-130*	*%REC*	1	5/7/2016 01:29
Surr: 4-Bromofluorobenzene	*93.4*			*70-130*	*%REC*	1	5/7/2016 01:29
Surr: Dibromofluoromethane	*99.0*			*70-130*	*%REC*	1	5/7/2016 01:29
Surr: Toluene-d8	*100*			*70-130*	*%REC*	1	5/7/2016 01:29
BIOCHEMICAL OXYGEN DEMAND		Method:	**A5210B-97**		Prep: A5210B / 4/29/16		Analyst: **JRF**
Biochemical Oxygen Demand	**140**		**59**	**59**	**mg/Kg-dry**	1	5/4/2016 10:00
CHLORIDE		Method:	**A4500-CL E-97**		Prep: EXTRACT / 5/2/16		Analyst: **ED**
Chloride	**120**		**6.4**	**59**	**mg/Kg-dry**	1	5/3/2016 14:00
CYANIDE, TOTAL		Method:	**SW9012B**		Prep: SW9012B / 5/2/16		Analyst: **JB**
Cyanide, Total	U		0.053	2.4	mg/Kg-dry	1	5/2/2016 15:09

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-May-16*

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E2:D000160
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-02
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND		Method: **E410.4 R2.0**			Prep: EXTRACT / 5/4/16		Analyst: **JJG**
Chemical Oxygen Demand	U		660	3,600	mg/Kg-dry	1	5/5/2016 09:30
MOISTURE		Method: **SW3550C**					Analyst: **LW**
Moisture	**83**		**0.025**	**0.050**	**% of sample**	1	4/29/2016 18:30
NITROGEN, TOTAL		Method: **CALCULATION**					Analyst: **JB**
Nitrogen, Total	**1,300**		**0**	**5.9**	**mg/Kg-dry**	1	5/3/2016 10:00
AMMONIA AS NITROGEN		Method: **A4500-NH3 G-97**					Analyst: **JJG**
Ammonia as Nitrogen	**100**	J	**35**	**120**	**mg NH3-N/Kg-dry**	1	5/4/2016 11:54
NITROGEN, NITRITE		Method: **A4500-NO2 B**			Prep: EXTRACT / 4/29/16		Analyst: **JB**
Nitrogen, Nitrite	U		0.043	3.8	mg/Kg-dry	1	5/2/2016 12:00
NITROGEN, NITRATE		Method: **E353.2**			Prep: EXTRACT / 4/29/16		Analyst: **JJG**
Nitrogen, Nitrate	**1.7**	J	**0.29**	**5.9**	**mg/Kg-dry**	1	5/2/2016 11:46
NITROGEN, NITRATE-NITRITE		Method: **E353.2**			Prep: EXTRACT / 4/29/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**2.0**	J	**0.45**	**5.9**	**mg/Kg-dry**	1	5/2/2016 11:46
NITROGEN, TOTAL INORGANIC		Method: **CALCULATION**					Analyst: **JB**
Nitrogen, Total Inorganic	**1,300**		**0**	**0.12**	**mg/Kg-dry**	1	5/5/2016 08:00
NITROGEN, TOTAL ORGANIC		Method: **CALCULATION**					Analyst: **JB**
Nitrogen, Total Organic	**1,200**		**5.9**	**5.9**	**mg/Kg-dry**	1	5/5/2016 08:00
PHOSPHORUS, TOTAL		Method: **E365.1 R2.0**			Prep: E365.1 R2.0 / 5/2/16		Analyst: **JJG**
Phosphorus, Total	**360**		**42**	**170**	**mg/Kg-dry**	5	5/3/2016 10:52
PH		Method: **SW9045D**			Prep: EXTRACT / 5/2/16		Analyst: **STP**
pH	**9.3**		**0**		**s.u.**	1	5/2/2016 16:30
PHOSPHORUS, ORTHO-P (AS P)		Method: **A4500-P E-97**			Prep: E365.1 R2.0 / 4/29/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	U		3.4	7.3	mg/Kg-dry	1	4/29/2016 15:56
NITROGEN, TOTAL KJELDAHL		Method: **A4500-NH3 G-97**			Prep: A4500-N B / 4/29/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**1,300**		**58**	**120**	**mg/Kg-dry**	1	5/2/2016 13:22
ORGANIC CARBON - WALKLEY-BLACK		Method: **TITRAMETRIC**					Analyst: **KF**
Organic Carbon - W-B	**3.5**		**0.071**	**0.15**	**% by wt-dry**	1	4/29/2016 09:33

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-May-16*

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E3:D000160
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3541 / 5/2/16		Analyst: **EB**
Aroclor 1016	U		74	620	µg/Kg-dry	1	5/3/2016 01:34
Aroclor 1221	U		74	620	µg/Kg-dry	1	5/3/2016 01:34
Aroclor 1232	U		74	620	µg/Kg-dry	1	5/3/2016 01:34
Aroclor 1242	U		74	620	µg/Kg-dry	1	5/3/2016 01:34
Aroclor 1248	U		74	620	µg/Kg-dry	1	5/3/2016 01:34
Aroclor 1254	U		93	620	µg/Kg-dry	1	5/3/2016 01:34
Aroclor 1260	U		93	620	µg/Kg-dry	1	5/3/2016 01:34
Surr: Decachlorobiphenyl	*78.1*			*40-140*	*%REC*	1	5/3/2016 01:34
Surr: Tetrachloro-m-xylene	*57.1*			*45-124*	*%REC*	1	5/3/2016 01:34
PESTICIDES		Method: **SW8081A**			Prep: SW3541 / 5/2/16		Analyst: **BLM**
4,4´-DDD	U		20	150	µg/Kg-dry	2	5/3/2016 08:45
4,4´-DDE	U		31	150	µg/Kg-dry	2	5/3/2016 08:45
4,4´-DDT	U		27	150	µg/Kg-dry	2	5/3/2016 08:45
Aldrin	U		23	150	µg/Kg-dry	2	5/3/2016 08:45
alpha-BHC	U		16	150	µg/Kg-dry	2	5/3/2016 08:45
alpha-Chlordane	U		25	150	µg/Kg-dry	2	5/3/2016 08:45
beta-BHC	U		53	150	µg/Kg-dry	2	5/3/2016 08:45
Chlordane, Technical	U		110	370	µg/Kg-dry	2	5/3/2016 08:45
delta-BHC	U		23	150	µg/Kg-dry	2	5/3/2016 08:45
Dieldrin	U		31	150	µg/Kg-dry	2	5/3/2016 08:45
Endosulfan I	U		20	150	µg/Kg-dry	2	5/3/2016 08:45
Endosulfan II	U		34	150	µg/Kg-dry	2	5/3/2016 08:45
Endosulfan sulfate	U		27	150	µg/Kg-dry	2	5/3/2016 08:45
Endrin	U		25	150	µg/Kg-dry	2	5/3/2016 08:45
Endrin aldehyde	U		61	150	µg/Kg-dry	2	5/3/2016 08:45
gamma-BHC (Lindane)	U		21	150	µg/Kg-dry	2	5/3/2016 08:45
Heptachlor	U		23	150	µg/Kg-dry	2	5/3/2016 08:45
Heptachlor epoxide	U		21	150	µg/Kg-dry	2	5/3/2016 08:45
Toxaphene	U		110	900	µg/Kg-dry	2	5/3/2016 08:45
Surr: Decachlorobiphenyl	*78.1*			*45-135*	*%REC*	2	5/3/2016 08:45
Surr: Tetrachloro-m-xylene	*58.1*			*45-124*	*%REC*	2	5/3/2016 08:45
MERCURY BY CVAA		Method: **SW7471A**			Prep: SW7471A / 5/3/16		Analyst: **LR**
Mercury	**0.023**	J	**0.0057**	**0.067**	**mg/Kg-dry**	1	5/3/2016 16:29
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/2/16		Analyst: **ML**
Magnesium	**27,000**		**19**	**660**	**mg/Kg-dry**	10	5/3/2016 05:42
Potassium	**780**		**110**	**660**	**mg/Kg-dry**	10	5/3/2016 05:42
Sodium	**240**	J	**67**	**660**	**mg/Kg-dry**	10	5/3/2016 05:42

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-May-16*

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E3:D000160
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3050B / 5/2/16		Analyst: **ML**
Antimony	U		0.20	16	mg/Kg-dry	10	5/3/2016 05:42
Arsenic	**3.4**	J	**2.6**	**16**	**mg/Kg-dry**	10	5/3/2016 05:42
Beryllium	**0.29**	J	**0.26**	**6.6**	**mg/Kg-dry**	10	5/3/2016 05:42
Cadmium	U		0.26	6.6	mg/Kg-dry	10	5/3/2016 05:42
Chromium	**5.1**	J	**2.6**	**16**	**mg/Kg-dry**	10	5/3/2016 05:42
Copper	**8.7**	J	**0.86**	**16**	**mg/Kg-dry**	10	5/3/2016 05:42
Lead	**3.9**	J	**0.39**	**16**	**mg/Kg-dry**	10	5/3/2016 05:42
Nickel	**11**	J	**2.8**	**16**	**mg/Kg-dry**	10	5/3/2016 05:42
Selenium	U		2.6	16	mg/Kg-dry	10	5/3/2016 05:42
Silver	U		0.46	16	mg/Kg-dry	10	5/3/2016 05:42
Thallium	U		0.46	16	mg/Kg-dry	10	5/3/2016 05:42
Zinc	**24**	J	**6.6**	**33**	**mg/Kg-dry**	10	5/3/2016 05:42
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3541 / 5/3/16		Analyst: **RM**
1,2-Diphenylhydrazine	U		26	500	µg/Kg-dry	1	5/4/2016 02:19
2,4,6-Trichlorophenol	U		140	500	µg/Kg-dry	1	5/4/2016 02:19
2,4-Dichlorophenol	U		110	500	µg/Kg-dry	1	5/4/2016 02:19
2,4-Dimethylphenol	U		100	500	µg/Kg-dry	1	5/4/2016 02:19
2,4-Dinitrophenol	U		280	500	µg/Kg-dry	1	5/4/2016 02:19
2,4-Dinitrotoluene	U		130	500	µg/Kg-dry	1	5/4/2016 02:19
2,6-Dinitrotoluene	U		84	500	µg/Kg-dry	1	5/4/2016 02:19
2-Chloronaphthalene	U		71	100	µg/Kg-dry	1	5/4/2016 02:19
2-Chlorophenol	U		160	500	µg/Kg-dry	1	5/4/2016 02:19
2-Nitrophenol	U		150	500	µg/Kg-dry	1	5/4/2016 02:19
3,3´-Dichlorobenzidine	U		76	2,600	µg/Kg-dry	1	5/4/2016 02:19
4,6-Dinitro-2-methylphenol	U		130	500	µg/Kg-dry	1	5/4/2016 02:19
4-Bromophenyl phenyl ether	U		140	500	µg/Kg-dry	1	5/4/2016 02:19
4-Chloro-3-methylphenol	U		150	500	µg/Kg-dry	1	5/4/2016 02:19
4-Chlorophenyl phenyl ether	U		140	500	µg/Kg-dry	1	5/4/2016 02:19
4-Nitrophenol	U		460	500	µg/Kg-dry	1	5/4/2016 02:19
Acenaphthene	U		74	100	µg/Kg-dry	1	5/4/2016 02:19
Acenaphthylene	U		88	100	µg/Kg-dry	1	5/4/2016 02:19
Anthracene	U		72	100	µg/Kg-dry	1	5/4/2016 02:19
Benzidine	U		3,900	10,000	µg/Kg-dry	1	5/4/2016 02:19
Benzo(a)anthracene	U		88	100	µg/Kg-dry	1	5/4/2016 02:19
Benzo(a)pyrene	U		63	100	µg/Kg-dry	1	5/4/2016 02:19
Benzo(b)fluoranthene	U		76	100	µg/Kg-dry	1	5/4/2016 02:19
Benzo(g,h,i)perylene	U		78	100	µg/Kg-dry	1	5/4/2016 02:19
Benzo(k)fluoranthene	U		77	100	µg/Kg-dry	1	5/4/2016 02:19

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-May-16*

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E3:D000160
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U		49	500	µg/Kg-dry	1	5/4/2016 02:19
Bis(2-chloroethyl)ether	U		140	500	µg/Kg-dry	1	5/4/2016 02:19
Bis(2-chloroisopropyl)ether	U		120	500	µg/Kg-dry	1	5/4/2016 02:19
Bis(2-ethylhexyl)phthalate	U		88	500	µg/Kg-dry	1	5/4/2016 02:19
Butyl benzyl phthalate	U		86	500	µg/Kg-dry	1	5/4/2016 02:19
Chrysene	U		82	100	µg/Kg-dry	1	5/4/2016 02:19
Dibenzo(a,h)anthracene	U		55	100	µg/Kg-dry	1	5/4/2016 02:19
Diethyl phthalate	U		78	500	µg/Kg-dry	1	5/4/2016 02:19
Dimethyl phthalate	U		99	500	µg/Kg-dry	1	5/4/2016 02:19
Di-n-butyl phthalate	U		93	500	µg/Kg-dry	1	5/4/2016 02:19
Di-n-octyl phthalate	U		98	500	µg/Kg-dry	1	5/4/2016 02:19
Fluoranthene	U		49	100	µg/Kg-dry	1	5/4/2016 02:19
Fluorene	U		74	100	µg/Kg-dry	1	5/4/2016 02:19
Hexachlorobenzene	U		150	500	µg/Kg-dry	1	5/4/2016 02:19
Hexachlorobutadiene	U		280	500	µg/Kg-dry	1	5/4/2016 02:19
Hexachlorocyclopentadiene	U		170	500	µg/Kg-dry	1	5/4/2016 02:19
Hexachloroethane	U		210	500	µg/Kg-dry	1	5/4/2016 02:19
Indeno(1,2,3-cd)pyrene	U		71	100	µg/Kg-dry	1	5/4/2016 02:19
Isophorone	U		100	2,600	µg/Kg-dry	1	5/4/2016 02:19
Naphthalene	U		65	100	µg/Kg-dry	1	5/4/2016 02:19
Nitrobenzene	U		170	2,600	µg/Kg-dry	1	5/4/2016 02:19
N-Nitrosodimethylamine	U		170	2,600	µg/Kg-dry	1	5/4/2016 02:19
N-Nitrosodi-n-propylamine	U		84	500	µg/Kg-dry	1	5/4/2016 02:19
N-Nitrosodiphenylamine	U		49	500	µg/Kg-dry	1	5/4/2016 02:19
Pentachlorophenol	U		190	500	µg/Kg-dry	1	5/4/2016 02:19
Phenanthrene	U		47	100	µg/Kg-dry	1	5/4/2016 02:19
Phenol	**1,200**		**130**	**500**	**µg/Kg-dry**	1	5/4/2016 02:19
Pyrene	U		19	100	µg/Kg-dry	1	5/4/2016 02:19
Surr: 2,4,6-Tribromophenol	*76.5*			*34-140*	*%REC*	1	5/4/2016 02:19
Surr: 2-Fluorobiphenyl	*78.6*			*12-100*	*%REC*	1	5/4/2016 02:19
Surr: 2-Fluorophenol	*85.2*			*33-117*	*%REC*	1	5/4/2016 02:19
Surr: 4-Terphenyl-d14	*77.2*			*25-137*	*%REC*	1	5/4/2016 02:19
Surr: Nitrobenzene-d5	*87.2*			*37-107*	*%REC*	1	5/4/2016 02:19
Surr: Phenol-d6	*81.2*			*40-106*	*%REC*	1	5/4/2016 02:19
VOLATILE ORGANICS - METHANOL CORRECTED		Method: **SW8260B**			Prep: SW5035 / 4/29/16		Analyst: **LSY**
1,1,1-Trichloroethane	U		110	370	µg/Kg-dry	1	5/7/2016 01:54
1,1,2,2-Tetrachloroethane	U		90	370	µg/Kg-dry	1	5/7/2016 01:54
1,1,2-Trichloroethane	U		110	370	µg/Kg-dry	1	5/7/2016 01:54
1,1-Dichloroethane	U		95	370	µg/Kg-dry	1	5/7/2016 01:54

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-May-16*

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E3:D000160
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,1-Dichloroethene	U		100	370	µg/Kg-dry	1	5/7/2016 01:54
1,2-Dichlorobenzene	U		110	370	µg/Kg-dry	1	5/7/2016 01:54
1,2-Dichloroethane	U		100	370	µg/Kg-dry	1	5/7/2016 01:54
1,2-Dichloropropane	U		100	370	µg/Kg-dry	1	5/7/2016 01:54
1,3-Dichlorobenzene	U		120	370	µg/Kg-dry	1	5/7/2016 01:54
1,4-Dichlorobenzene	U		97	370	µg/Kg-dry	1	5/7/2016 01:54
Acrolein	U		1,100	2,500	µg/Kg-dry	1	5/7/2016 01:54
Acrylonitrile	U		310	1,200	µg/Kg-dry	1	5/7/2016 01:54
Benzene	U		84	370	µg/Kg-dry	1	5/7/2016 01:54
Bromodichloromethane	U		100	370	µg/Kg-dry	1	5/7/2016 01:54
Bromoform	U		130	370	µg/Kg-dry	1	5/7/2016 01:54
Bromomethane	U		160	930	µg/Kg-dry	1	5/7/2016 01:54
Carbon tetrachloride	U		66	370	µg/Kg-dry	1	5/7/2016 01:54
Chlorobenzene	U		110	370	µg/Kg-dry	1	5/7/2016 01:54
Chloroethane	U		240	1,200	µg/Kg-dry	1	5/7/2016 01:54
Chloroform	U		130	370	µg/Kg-dry	1	5/7/2016 01:54
Chloromethane	U		150	1,200	µg/Kg-dry	1	5/7/2016 01:54
cis-1,2-Dichloroethene	U		110	370	µg/Kg-dry	1	5/7/2016 01:54
cis-1,3-Dichloropropene	U		140	370	µg/Kg-dry	1	5/7/2016 01:54
Dibromochloromethane	U		85	370	µg/Kg-dry	1	5/7/2016 01:54
Ethylbenzene	U		87	370	µg/Kg-dry	1	5/7/2016 01:54
Methylene chloride	U		170	370	µg/Kg-dry	1	5/7/2016 01:54
Tetrachloroethene	U		180	370	µg/Kg-dry	1	5/7/2016 01:54
Toluene	U		120	370	µg/Kg-dry	1	5/7/2016 01:54
trans-1,2-Dichloroethene	U		110	370	µg/Kg-dry	1	5/7/2016 01:54
trans-1,3-Dichloropropene	U		67	370	µg/Kg-dry	1	5/7/2016 01:54
Trichloroethene	U		99	370	µg/Kg-dry	1	5/7/2016 01:54
Vinyl chloride	U		120	370	µg/Kg-dry	1	5/7/2016 01:54
Surr: 1,2-Dichloroethane-d4	*103*			*70-130*	*%REC*	1	5/7/2016 01:54
Surr: 4-Bromofluorobenzene	*92.6*			*70-130*	*%REC*	1	5/7/2016 01:54
Surr: Dibromofluoromethane	*95.2*			*70-130*	*%REC*	1	5/7/2016 01:54
Surr: Toluene-d8	*99.4*			*70-130*	*%REC*	1	5/7/2016 01:54
BIOCHEMICAL OXYGEN DEMAND		Method:	**A5210B-97**		Prep: A5210B / 4/29/16		Analyst: **JRF**
Biochemical Oxygen Demand	**140**		**51**	**51**	**mg/Kg-dry**	1	5/4/2016 10:00
CHLORIDE		Method:	**A4500-CL E-97**		Prep: EXTRACT / 5/2/16		Analyst: **ED**
Chloride	**99**		**5.6**	**51**	**mg/Kg-dry**	1	5/3/2016 14:00
CYANIDE, TOTAL		Method:	**SW9012B**		Prep: SW9012B / 5/2/16		Analyst: **JB**
Cyanide, Total	U		0.049	2.2	mg/Kg-dry	1	5/2/2016 15:09

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *09-May-16*

Client: Hull & Associates, Inc.
Project: RCK001 Lagoon E
Sample ID: RCK001:E3:D000160
Collection Date: 4/26/2016 04:30 PM

Work Order: 16041611
Lab ID: 16041611-03
Matrix: SOIL

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
CHEMICAL OXYGEN DEMAND			Method: **E410.4 R2.0**		Prep: EXTRACT / 5/4/16		Analyst: **JJG**
Chemical Oxygen Demand	**560**	J	**450**	**2,400**	**mg/Kg-dry**	1	5/5/2016 09:30
MOISTURE			Method: **SW3550C**				Analyst: **LW**
Moisture	**81**		**0.025**	**0.050**	**% of sample**	1	4/29/2016 18:30
NITROGEN, TOTAL			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total	**1,200**		**0**	**5.2**	**mg/Kg-dry**	1	5/3/2016 10:00
AMMONIA AS NITROGEN			Method: **A4500-NH3 G-97**				Analyst: **JJG**
Ammonia as Nitrogen	**78**	J	**41**	**140**	**mg NH3-N/Kg-dry**	1	5/4/2016 11:54
NITROGEN, NITRITE			Method: **A4500-NO2 B**		Prep: EXTRACT / 4/29/16		Analyst: **JB**
Nitrogen, Nitrite	U		0.039	3.4	mg/Kg-dry	1	5/2/2016 12:00
NITROGEN, NITRATE			Method: **E353.2**		Prep: EXTRACT / 4/29/16		Analyst: **JJG**
Nitrogen, Nitrate	**2.4**	J	**0.24**	**5.0**	**mg/Kg-dry**	1	5/2/2016 11:46
NITROGEN, NITRATE-NITRITE			Method: **E353.2**		Prep: EXTRACT / 4/29/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**2.6**	J	**0.38**	**5.0**	**mg/Kg-dry**	1	5/2/2016 11:46
NITROGEN, TOTAL INORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Inorganic	**1,200**		**0**	**0.10**	**mg/Kg-dry**	1	5/5/2016 08:00
NITROGEN, TOTAL ORGANIC			Method: **CALCULATION**				Analyst: **JB**
Nitrogen, Total Organic	**1,200**		**5.2**	**5.2**	**mg/Kg-dry**	1	5/5/2016 08:00
PHOSPHORUS, TOTAL			Method: **E365.1 R2.0**		Prep: E365.1 R2.0 / 5/2/16		Analyst: **JJG**
Phosphorus, Total	**330**		**34**	**140**	**mg/Kg-dry**	5	5/3/2016 10:52
PH			Method: **SW9045D**		Prep: EXTRACT / 5/2/16		Analyst: **STP**
pH	**9.3**		**0**		**s.u.**	1	5/2/2016 16:30
PHOSPHORUS, ORTHO-P (AS P)			Method: **A4500-P E-97**		Prep: E365.1 R2.0 / 4/29/16		Analyst: **JJG**
Phosphorus, Ortho-P (As P)	U		2.7	5.7	mg/Kg-dry	1	4/29/2016 15:56
NITROGEN, TOTAL KJELDAHL			Method: **A4500-NH3 G-97**		Prep: A4500-N B / 4/29/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	**1,200**		**53**	**110**	**mg/Kg-dry**	1	5/2/2016 13:22
ORGANIC CARBON - WALKLEY-BLACK			Method: **TITRAMETRIC**				Analyst: **KF**
Organic Carbon - W-B	**3.4**		**0.062**	**0.13**	**% by wt-dry**	1	4/29/2016 09:33

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 09-May-16

Client: Hull & Associates, Inc.

Work Order: 16041611

Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85455** Instrument ID **GC14** Method: **SW8082**

MBLK Sample ID: **PBLKS1-85455-85455** Units: **µg/Kg** Analysis Date: **5/2/2016 05:40 PM**

Client ID: Run ID: **GC14_160502A** SeqNo: **3807236** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	U	83								
Aroclor 1221	U	83								
Aroclor 1232	U	83								
Aroclor 1242	U	83								
Aroclor 1248	U	83								
Aroclor 1254	U	83								
Aroclor 1260	U	83								
Surr: Decachlorobiphenyl	*31*	0	*33.3*	0	*93.1*	*40-140*	0			
Surr: Tetrachloro-m-xylene	*26.67*	0	*33.3*	0	*80.1*	*45-124*	0			

LCS Sample ID: **PLCSS1-85455-85455** Units: **µg/Kg** Analysis Date: **5/2/2016 05:58 PM**

Client ID: Run ID: **GC14_160502A** SeqNo: **3807237** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	975.7	83	833	0	117	50-130	0			
Aroclor 1260	990.7	83	833	0	119	50-130	0			
Surr: Decachlorobiphenyl	*33*	0	*33.3*	0	*99.1*	*40-140*	0			
Surr: Tetrachloro-m-xylene	*26.67*	0	*33.3*	0	*80.1*	*45-124*	0			

MS Sample ID: **1605001-01C MS** Units: **µg/Kg** Analysis Date: **5/2/2016 06:33 PM**

Client ID: Run ID: **GC14_160502A** SeqNo: **3807239** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	922.1	81	807.4	0	114	40-140	0			
Aroclor 1260	943.1	81	807.4	0	117	40-140	0			
Surr: Decachlorobiphenyl	*31.34*	0	*32.28*	0	*97.1*	*40-140*	0			
Surr: Tetrachloro-m-xylene	*25.2*	0	*32.28*	0	*78.1*	*45-124*	0			

MSD Sample ID: **1605001-01C MSD** Units: **µg/Kg** Analysis Date: **5/2/2016 06:50 PM**

Client ID: Run ID: **GC14_160502A** SeqNo: **3807240** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	930	78	784.1	0	119	40-140	922.1	0.859	50	
Aroclor 1260	945.4	78	784.1	0	121	40-140	943.1	0.247	50	
Surr: Decachlorobiphenyl	*30.75*	0	*31.35*	0	*98.1*	*40-140*	31.34	*1.9*		
Surr: Tetrachloro-m-xylene	*25.42*	0	*31.35*	0	*81.1*	*45-124*	25.2	*0.851*		

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85456** Instrument ID **GC12** Method: **SW8081A**

MBLK Sample ID: **PBLKS1-85456-85456** Units: **µg/Kg** Analysis Date: **5/2/2016 03:58 PM**
Client ID: Run ID: **GC12_160502A** SeqNo: **3808767** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	U	10								
4,4´-DDE	U	10								
4,4´-DDT	U	10								
Aldrin	U	10								
alpha-BHC	U	10								
alpha-Chlordane	U	10								
beta-BHC	U	10								
Chlordane, Technical	U	25								
delta-BHC	U	10								
Dieldrin	U	10								
Endosulfan I	U	10								
Endosulfan II	U	10								
Endosulfan sulfate	U	10								
Endrin	U	10								
Endrin aldehyde	U	10								
gamma-BHC (Lindane)	U	10								
Heptachlor	U	10								
Heptachlor epoxide	U	10								
Toxaphene	U	60								
Surr: Decachlorobiphenyl	*38.33*	0	*33.3*	0	*115*	*45-135*	0			
Surr: Tetrachloro-m-xylene	*33*	0	*33.3*	0	*99.1*	*45-124*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85456** Instrument ID **GC12** Method: **SW8081A**

LCS Sample ID: **PLCSS1-85456-85456** Units: **µg/Kg** Analysis Date: **5/2/2016 04:15 PM**
Client ID: Run ID: **GC12_160502A** SeqNo: **3808768** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	33.33	10	33.33	0	100	30-135	0			
4,4´-DDE	31.67	10	33.33	0	95	70-125	0			
4,4´-DDT	32.67	10	33.33	0	98	45-140	0			
Aldrin	31	10	33.33	0	93	45-140	0			
alpha-BHC	30.33	10	33.33	0	91	60-125	0			
alpha-Chlordane	33.33	10	33.33	0	100	50-150	0			
beta-BHC	32.33	10	33.33	0	97	60-125	0			
delta-BHC	32	10	33.33	0	96	55-130	0			
Dieldrin	32	10	33.33	0	96	65-125	0			
Endosulfan I	31.67	10	33.33	0	95	15-135	0			
Endosulfan II	33	10	33.33	0	99	35-140	0			
Endosulfan sulfate	34	10	33.33	0	102	60-135	0			
Endrin	39	10	33.33	0	117	60-135	0			
Endrin aldehyde	25	10	33.33	0	75	35-145	0			
gamma-BHC (Lindane)	30	10	33.33	0	90	60-125	0			
Heptachlor	32.33	10	33.33	0	97	50-140	0			
Heptachlor epoxide	32.33	10	33.33	0	97	65-130	0			
Surr: Decachlorobiphenyl	*38.33*	0	*33.3*	0	*115*	*45-135*	0			
Surr: Tetrachloro-m-xylene	*32.67*	0	*33.3*	0	*98.1*	*45-124*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85456** Instrument ID **GC12** Method: **SW8081A**

MS Sample ID: **16041716-01A MS** Units: **µg/Kg** Analysis Date: **5/3/2016 03:25 PM**

Client ID: Run ID: **GC12_160502A** SeqNo: **3808773** Prep Date: **5/2/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	31.61	23	37.63	0	84	30-135	0			
4,4´-DDE	24.84	23	37.63	0	66	70-125	0			S
4,4´-DDT	6.775	23	37.63	0	18	45-140	0			JS
Aldrin	17.31	23	37.63	0	46	45-140	0			J
alpha-BHC	22.58	23	37.63	0	60	60-125	0			J
alpha-Chlordane	19.57	23	37.63	0	52	50-150	0			J
beta-BHC	24.84	23	37.63	0	66	60-125	0			
delta-BHC	24.84	23	37.63	0	66	55-130	0			
Dieldrin	24.09	23	37.63	0	64	65-125	0			S
Endosulfan I	23.33	23	37.63	0	62	15-135	0			
Endosulfan II	24.09	23	37.63	0	64	35-140	0			
Endosulfan sulfate	22.58	23	37.63	0	60	60-135	0			J
Endrin	27.1	23	37.63	0	72	60-135	0			
Endrin aldehyde	U	23	37.63	0	0	35-145	0			S
gamma-BHC (Lindane)	33.87	23	37.63	0	90	60-125	0			
Heptachlor	17.31	23	37.63	0	46	50-140	0			JS
Heptachlor epoxide	24.84	23	37.63	0	66	65-130	0			
Surr: Decachlorobiphenyl	*30.11*	0	*37.6*	0	*80.1*	*45-135*	0			
Surr: Tetrachloro-m-xylene	*24.84*	0	*37.6*	0	*66.1*	*45-124*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85456** Instrument ID **GC12** Method: **SW8081A**

MSD Sample ID: **16041716-01A MSD** Units: **µg/Kg** Analysis Date: **5/3/2016 03:56 PM**

Client ID: Run ID: **GC12_160502A** SeqNo: **3808774** Prep Date: **5/2/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	25.98	21	34.18	0	76	30-135	31.61	19.6	35	
4,4´-DDE	21.19	21	34.18	0	62	70-125	24.84	15.9	35	S
4,4´-DDT	4.785	21	34.18	0	14	45-140	6.775	0	35	JS
Aldrin	14.36	21	34.18	0	42	45-140	17.31	0	35	JS
alpha-BHC	17.09	21	34.18	0	50	60-125	22.58	0	35	JS
alpha-Chlordane	15.72	21	34.18	0	46	50-150	19.57	0	35	JS
beta-BHC	21.19	21	34.18	0	62	60-125	24.84	15.9	35	
delta-BHC	17.77	21	34.18	0	52	55-130	24.84	0	35	JS
Dieldrin	18.46	21	34.18	0	54	65-125	24.09	0	35	JS
Endosulfan I	20.51	21	34.18	0	60	15-135	23.33	0	35	J
Endosulfan II	20.51	21	34.18	0	60	35-140	24.09	0	35	J
Endosulfan sulfate	15.72	21	34.18	0	46	60-135	22.58	0	35	JS
Endrin	24.61	21	34.18	0	72	60-135	27.1	9.63	35	
Endrin aldehyde	U	21	34.18	0	0	35-145	6.775	0	35	S
gamma-BHC (Lindane)	23.24	21	34.18	0	68	60-125	33.87	37.2	35	R
Heptachlor	13.67	21	34.18	0	40	50-140	17.31	0	35	JS
Heptachlor epoxide	20.51	21	34.18	0	60	65-130	24.84	0	35	JS
Surr: Decachlorobiphenyl	*25.29*	0	*34.14*	0	*74.1*	*45-135*	30.11	*17.4*	*35*	
Surr: Tetrachloro-m-xylene	*19.14*	0	*34.14*	0	*56.1*	*45-124*	24.84	*25.9*	*35*	

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85528** Instrument ID **HG1** Method: **SW7471A**

MBLK Sample ID: **MBLK-85528-85528** Units: **mg/Kg** Analysis Date: **5/3/2016 04:09 PM**
Client ID: Run ID: **HG1_160503A** SeqNo: **3808283** Prep Date: **5/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.020								

LCS Sample ID: **LCS-85528-85528** Units: **mg/Kg** Analysis Date: **5/3/2016 04:12 PM**
Client ID: Run ID: **HG1_160503A** SeqNo: **3808284** Prep Date: **5/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1692	0.020	0.1665	0	102	80-120	0			

MS Sample ID: **16041611-01BMS** Units: **mg/Kg** Analysis Date: **5/3/2016 04:16 PM**
Client ID: **RCK001:E1:D000180** Run ID: **HG1_160503A** SeqNo: **3808286** Prep Date: **5/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.1081	0.013	0.107	0.004171	97.2	75-125	0			

MSD Sample ID: **16041611-01BMSD** Units: **mg/Kg** Analysis Date: **5/3/2016 04:18 PM**
Client ID: **RCK001:E1:D000180** Run ID: **HG1_160503A** SeqNo: **3808287** Prep Date: **5/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.113	0.013	0.1086	0.004171	100	75-125	0.1081	4.44	35	

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85461** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-85461-85461** Units: **mg/Kg** Analysis Date: **5/3/2016 04:27 AM**
Client ID: Run ID: **ICPMS1_160502A** SeqNo: **3805834** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	0.295	10								J
Potassium	U	10								
Sodium	U	10								

LCS Sample ID: **LCS-85461-85461** Units: **mg/Kg** Analysis Date: **5/3/2016 04:33 AM**
Client ID: Run ID: **ICPMS1_160502A** SeqNo: **3805835** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	472.2	10	500	0	94.4	80-120	0			
Potassium	456.6	10	500	0	91.3	80-120	0			
Sodium	467.1	10	500	0	93.4	80-120	0			

MS Sample ID: **16041659-03AMS** Units: **mg/Kg** Analysis Date: **5/3/2016 07:36 AM**
Client ID: Run ID: **ICPMS1_160502A** SeqNo: **3805862** Prep Date: **5/2/2016** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	11470	58	722.5	26530	-2080	75-125	0			SO
Potassium	1267	58	722.5	244.5	142	75-125	0			S
Sodium	900.3	58	722.5	65.34	116	75-125	0			

MSD Sample ID: **16041659-03AMSD** Units: **mg/Kg** Analysis Date: **5/3/2016 07:42 AM**
Client ID: Run ID: **ICPMS1_160502A** SeqNo: **3805863** Prep Date: **5/2/2016** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	11820	58	719.4	26530	-2040	75-125	11470	2.94	25	SO
Potassium	1139	58	719.4	244.5	124	75-125	1267	10.7	25	
Sodium	831.7	58	719.4	65.34	107	75-125	900.3	7.93	25	

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85488** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-85488-85488** Units: **mg/Kg** Analysis Date: **5/3/2016 04:27 AM**
Client ID: Run ID: **ICPMS1_160502A** SeqNo: **3810851** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.50								
Arsenic	U	0.50								
Beryllium	U	0.50								
Cadmium	U	0.50								
Chromium	U	0.50								
Copper	U	0.50								
Lead	0.01504	0.50								J
Nickel	U	0.50								
Selenium	U	0.50								
Silver	U	0.50								
Thallium	U	0.50								
Zinc	U	0.50								

LCS Sample ID: **LCS-85488-85488** Units: **mg/Kg** Analysis Date: **5/3/2016 04:33 AM**
Client ID: Run ID: **ICPMS1_160502A** SeqNo: **3810852** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	4.53	0.50	5	0	90.6	80-120	0			
Arsenic	4.332	0.50	5	0	86.6	80-120	0			
Beryllium	4.684	0.50	5	0	93.7	80-120	0			
Cadmium	4.488	0.50	5	0	89.8	80-120	0			
Chromium	4.659	0.50	5	0	93.2	80-120	0			
Copper	4.534	0.50	5	0	90.7	80-120	0			
Lead	4.578	0.50	5	0	91.6	80-120	0			
Nickel	4.612	0.50	5	0	92.2	80-120	0			
Selenium	4.466	0.50	5	0	89.3	80-120	0			
Silver	4.499	0.50	5	0	90	80-120	0			
Thallium	4.366	0.50	5	0	87.3	80-120	0			
Zinc	4.356	0.50	5	0	87.1	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85488** Instrument ID **ICPMS1** Method: **SW6020A**

MS Sample ID: **16041659-03AMS** Units: **mg/Kg** Analysis Date: **5/3/2016 07:36 AM**
Client ID: Run ID: **ICPMS1_160502A** SeqNo: **3810857** Prep Date: **5/2/2016** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	7.416	2.9	7.225	0.08433	101	75-125	0			
Arsenic	9.208	2.9	7.225	1.195	111	75-125	0			
Beryllium	8.751	2.9	7.225	0.09524	120	75-125	0			
Cadmium	7.994	2.9	7.225	0.2709	107	75-125	0			
Chromium	13.3	2.9	7.225	3.781	132	75-125	0			S
Copper	13.44	2.9	7.225	4.147	129	75-125	0			S
Lead	24.86	2.9	7.225	19.02	80.8	75-125	0			
Nickel	12.29	2.9	7.225	3.778	118	75-125	0			
Selenium	7.613	2.9	7.225	0.1978	103	75-125	0			
Silver	6.939	2.9	7.225	0.009137	95.9	75-125	0			
Thallium	7.72	2.9	7.225	0.02921	106	75-125	0			
Zinc	91.91	2.9	7.225	66.9	346	75-125	0			SEO

MSD Sample ID: **16041659-03AMSD** Units: **mg/Kg** Analysis Date: **5/3/2016 07:42 AM**
Client ID: Run ID: **ICPMS1_160502A** SeqNo: **3810858** Prep Date: **5/2/2016** DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	6.647	2.9	7.194	0.08433	91.2	75-125	7.416	10.9	25	
Arsenic	8.158	2.9	7.194	1.195	96.8	75-125	9.208	12.1	25	
Beryllium	7.77	2.9	7.194	0.09524	107	75-125	8.751	11.9	25	
Cadmium	7.105	2.9	7.194	0.2709	95	75-125	7.994	11.8	25	
Chromium	12.73	2.9	7.194	3.781	124	75-125	13.3	4.4	25	
Copper	13.57	2.9	7.194	4.147	131	75-125	13.44	0.977	25	S
Lead	20.41	2.9	7.194	19.02	19.3	75-125	24.86	19.7	25	S
Nickel	11.82	2.9	7.194	3.778	112	75-125	12.29	3.95	25	
Selenium	7.022	2.9	7.194	0.1978	94.9	75-125	7.613	8.08	25	
Silver	6.354	2.9	7.194	0.009137	88.2	75-125	6.939	8.81	25	
Thallium	6.967	2.9	7.194	0.02921	96.4	75-125	7.72	10.3	25	
Zinc	88.29	2.9	7.194	66.9	297	75-125	91.91	4.02	25	SEO

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **85523** Instrument ID **SVMS8** Method: **SW8270C**

MBLK Sample ID: **SBLKS1-85522-85523** Units: **µg/Kg** Analysis Date: **5/3/2016 04:41 PM**

Client ID: Run ID: **SVMS8_160503A** SeqNo: **3810222** Prep Date: **5/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	33								
2,4,6-Trichlorophenol	U	33								
2,4-Dichlorophenol	U	33								
2,4-Dimethylphenol	U	33								
2,4-Dinitrophenol	U	33								
2,4-Dinitrotoluene	U	33								
2,6-Dinitrotoluene	U	33								
2-Chloronaphthalene	U	6.7								
2-Chlorophenol	U	33								
2-Nitrophenol	U	33								
3,3´-Dichlorobenzidine	U	170								
4,6-Dinitro-2-methylphenol	U	33								
4-Bromophenyl phenyl ether	U	33								
4-Chloro-3-methylphenol	U	33								
4-Chlorophenyl phenyl ether	U	33								
4-Nitrophenol	U	33								
Acenaphthene	U	6.7								
Acenaphthylene	U	6.7								
Anthracene	U	6.7								
Benzidine	U	670								
Benzo(a)anthracene	U	6.7								
Benzo(a)pyrene	U	6.7								
Benzo(b)fluoranthene	U	6.7								
Benzo(g,h,i)perylene	U	6.7								
Benzo(k)fluoranthene	U	6.7								
Bis(2-chloroethoxy)methane	U	33								
Bis(2-chloroethyl)ether	U	33								
Bis(2-chloroisopropyl)ether	U	33								
Bis(2-ethylhexyl)phthalate	U	33								
Butyl benzyl phthalate	U	33								
Chrysene	U	6.7								
Dibenzo(a,h)anthracene	U	6.7								
Diethyl phthalate	U	33								
Dimethyl phthalate	U	33								
Di-n-butyl phthalate	U	33								
Di-n-octyl phthalate	U	33								
Fluoranthene	U	6.7								
Fluorene	U	6.7								
Hexachlorobenzene	U	33								
Hexachlorobutadiene	U	33								
Hexachlorocyclopentadiene	U	33								
Hexachloroethane	U	33								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **85523** Instrument ID **SVMS8** Method: **SW8270C**

Indeno(1,2,3-cd)pyrene	U	6.7					
Isophorone	U	170					
Naphthalene	U	6.7					
Nitrobenzene	U	170					
N-Nitrosodimethylamine	U	170					
N-Nitrosodi-n-propylamine	U	33					
N-Nitrosodiphenylamine	U	33					
Pentachlorophenol	U	33					
Phenanthrene	U	6.7					
Phenol	U	33					
Pyrene	U	6.7					
Surr: 2,4,6-Tribromophenol	*1283*	0	*1667*	0	*77*	*34-140*	0
Surr: 2-Fluorobiphenyl	*1224*	0	*1667*	0	*73.5*	*12-100*	0
Surr: 2-Fluorophenol	*1463*	0	*1667*	0	*87.8*	*33-117*	0
Surr: 4-Terphenyl-d14	*1804*	0	*1667*	0	*108*	*25-137*	0
Surr: Nitrobenzene-d5	*1319*	0	*1667*	0	*79.1*	*37-107*	0
Surr: Phenol-d6	*1484*	0	*1667*	0	*89.1*	*40-106*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85523** Instrument ID **SVMS8** Method: **SW8270C**

LCS Sample ID: **SLCSS1-85522-85523** Units: **µg/Kg** Analysis Date: **5/3/2016 05:01 PM**

Client ID: Run ID: **SVMS8_160503A** SeqNo: **3810223** Prep Date: **5/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	615.3	33	666.7	0	92.3	55-115	0			
2,4,6-Trichlorophenol	515.3	33	666.7	0	77.3	45-110	0			
2,4-Dichlorophenol	570	33	666.7	0	85.5	45-110	0			
2,4-Dimethylphenol	519.7	33	666.7	0	77.9	30-105	0			
2,4-Dinitrophenol	265	33	666.7	0	39.7	15-130	0			
2,4-Dinitrotoluene	529.3	33	666.7	0	79.4	50-115	0			
2,6-Dinitrotoluene	522.3	33	666.7	0	78.3	50-110	0			
2-Chloronaphthalene	494.7	6.7	666.7	0	74.2	45-105	0			
2-Chlorophenol	569.7	33	666.7	0	85.4	45-105	0			
2-Nitrophenol	556.7	33	666.7	0	83.5	40-110	0			
3,3´-Dichlorobenzidine	566.3	170	666.7	0	84.9	30-120	0			
4,6-Dinitro-2-methylphenol	445.7	33	666.7	0	66.8	40-130	0			
4-Bromophenyl phenyl ether	656.3	33	666.7	0	98.4	45-115	0			
4-Chloro-3-methylphenol	572.3	33	666.7	0	85.8	45-115	0			
4-Chlorophenyl phenyl ether	496.3	33	666.7	0	74.4	45-110	0			
4-Nitrophenol	470.3	33	666.7	0	70.5	15-140	0			
Acenaphthene	479	6.7	666.7	0	71.8	45-110	0			
Acenaphthylene	521.3	6.7	666.7	0	78.2	45-105	0			
Anthracene	629	6.7	666.7	0	94.3	55-105	0			
Benzo(a)anthracene	634.7	6.7	666.7	0	95.2	50-110	0			
Benzo(a)pyrene	728	6.7	666.7	0	109	50-110	0			
Benzo(b)fluoranthene	763.7	6.7	666.7	0	115	45-115	0			
Benzo(g,h,i)perylene	748	6.7	666.7	0	112	40-125	0			
Benzo(k)fluoranthene	756.3	6.7	666.7	0	113	45-115	0			
Bis(2-chloroethoxy)methane	552.3	33	666.7	0	82.8	45-110	0			
Bis(2-chloroethyl)ether	531.7	33	666.7	0	79.7	40-105	0			
Bis(2-chloroisopropyl)ether	563	33	666.7	0	84.4	20-115	0			
Bis(2-ethylhexyl)phthalate	633.3	33	666.7	0	95	45-125	0			
Butyl benzyl phthalate	702.7	33	666.7	0	105	50-125	0			
Chrysene	615.3	6.7	666.7	0	92.3	55-110	0			
Dibenzo(a,h)anthracene	691.3	6.7	666.7	0	104	40-125	0			
Diethyl phthalate	506	33	666.7	0	75.9	50-115	0			
Dimethyl phthalate	512.7	33	666.7	0	76.9	50-110	0			
Di-n-butyl phthalate	642.3	33	666.7	0	96.3	55-110	0			
Di-n-octyl phthalate	782	33	666.7	0	117	40-130	0			
Fluoranthene	635.3	6.7	666.7	0	95.3	55-115	0			
Fluorene	505.7	6.7	666.7	0	75.8	50-110	0			
Hexachlorobenzene	621.3	33	666.7	0	93.2	45-120	0			
Hexachlorobutadiene	577.3	33	666.7	0	86.6	40-115	0			
Hexachlorocyclopentadiene	551.3	33	666.7	0	82.7	40-115	0			
Hexachloroethane	536	33	666.7	0	80.4	35-110	0			
Indeno(1,2,3-cd)pyrene	754.3	6.7	666.7	0	113	40-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **85523** Instrument ID **SVMS8** Method: **SW8270C**

Isophorone	529.7	170	666.7	0	79.4	45-110	0
Naphthalene	532	6.7	666.7	0	79.8	40-105	0
Nitrobenzene	562.7	170	666.7	0	84.4	40-115	0
N-Nitrosodimethylamine	559.7	170	666.7	0	83.9	20-115	0
N-Nitrosodi-n-propylamine	560	33	666.7	0	84	40-115	0
N-Nitrosodiphenylamine	649	33	666.7	0	97.3	50-115	0
Pentachlorophenol	435	33	666.7	0	65.2	25-120	0
Phenanthrene	584.7	6.7	666.7	0	87.7	50-110	0
Phenol	601.7	33	666.7	0	90.2	40-100	0
Pyrene	703.7	6.7	666.7	0	106	45-125	0
Surr: 2,4,6-Tribromophenol	*1432*	0	*1667*	0	*85.9*	*34-140*	0
Surr: 2-Fluorobiphenyl	*1212*	0	*1667*	0	*72.7*	*12-100*	0
Surr: 2-Fluorophenol	*1394*	0	*1667*	0	*83.6*	*33-117*	0
Surr: 4-Terphenyl-d14	*1660*	0	*1667*	0	*99.6*	*25-137*	0
Surr: Nitrobenzene-d5	*1369*	0	*1667*	0	*82.2*	*37-107*	0
Surr: Phenol-d6	*1328*	0	*1667*	0	*79.7*	*40-106*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85523** Instrument ID **SVMS8** Method: **SW8270C**

MS Sample ID: **1605001-02C MS** Units: **µg/Kg** Analysis Date: **5/3/2016 06:11 PM**

Client ID: Run ID: **SVMS8_160503A** SeqNo: **3810224** Prep Date: **5/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	667.7	32	656.5	0	102	55-115	0			
2,4,6-Trichlorophenol	554.8	32	656.5	0	84.5	45-110	0			
2,4-Dichlorophenol	579	32	656.5	0	88.2	45-110	0			
2,4-Dimethylphenol	545.6	32	656.5	0	83.1	30-105	0			
2,4-Dinitrophenol	484.5	32	656.5	0	73.8	15-130	0			
2,4-Dinitrotoluene	541	32	656.5	0	82.4	50-115	0			
2,6-Dinitrotoluene	530.1	32	656.5	0	80.7	50-110	0			
2-Chloronaphthalene	489.8	6.6	656.5	0	74.6	45-105	0			
2-Chlorophenol	557.4	32	656.5	0	84.9	45-105	0			
2-Nitrophenol	593.8	32	656.5	0	90.4	40-110	0			
3,3´-Dichlorobenzidine	578.1	160	656.5	0	88	30-120	0			
4,6-Dinitro-2-methylphenol	618.1	32	656.5	0	94.1	40-130	0			
4-Bromophenyl phenyl ether	697.5	32	656.5	0	106	45-115	0			
4-Chloro-3-methylphenol	586.9	32	656.5	0	89.4	45-115	0			
4-Chlorophenyl phenyl ether	528.2	32	656.5	0	80.4	45-110	0			
4-Nitrophenol	480.9	32	656.5	0	73.2	15-140	0			
Acenaphthene	499.3	6.6	656.5	0	76	45-110	0			
Acenaphthylene	522.3	6.6	656.5	0	79.5	45-105	0			
Anthracene	649.6	6.6	656.5	0	98.9	55-105	0			
Benzo(a)anthracene	633.9	6.6	656.5	0	96.5	50-110	0			
Benzo(a)pyrene	763.9	6.6	656.5	0	116	50-110	0			S
Benzo(b)fluoranthene	730	6.6	656.5	0	111	45-115	0			
Benzo(g,h,i)perylene	760.6	6.6	656.5	0	116	40-125	0			
Benzo(k)fluoranthene	718.9	6.6	656.5	0	109	45-115	0			
Bis(2-chloroethoxy)methane	537.7	32	656.5	0	81.9	45-110	0			
Bis(2-chloroethyl)ether	535.4	32	656.5	0	81.5	40-105	0			
Bis(2-chloroisopropyl)ether	556.4	32	656.5	0	84.7	20-115	0			
Bis(2-ethylhexyl)phthalate	634.8	32	656.5	239	60.3	45-125	0			
Butyl benzyl phthalate	701.8	32	656.5	0	107	50-125	0			
Chrysene	610.2	6.6	656.5	0	92.9	55-110	0			
Dibenzo(a,h)anthracene	700.5	6.6	656.5	0	107	40-125	0			
Diethyl phthalate	523.9	32	656.5	0	79.8	50-115	0			
Dimethyl phthalate	528.2	32	656.5	0	80.4	50-110	0			
Di-n-butyl phthalate	652.6	32	656.5	0	99.4	55-110	0			
Di-n-octyl phthalate	726.4	32	656.5	0	111	40-130	0			
Fluoranthene	630.3	6.6	656.5	0	96	55-115	0			
Fluorene	532.1	6.6	656.5	0	81	50-110	0			
Hexachlorobenzene	652.9	32	656.5	0	99.4	45-120	0			
Hexachlorobutadiene	550.2	32	656.5	0	83.8	40-115	0			
Hexachlorocyclopentadiene	514.7	32	656.5	0	78.4	40-115	0			
Hexachloroethane	534.1	32	656.5	0	81.3	35-110	0			
Indeno(1,2,3-cd)pyrene	772.4	6.6	656.5	0	118	40-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **85523** Instrument ID **SVMS8** Method: **SW8270C**

Isophorone	524.9	160	656.5	0	79.9	45-110	0
Naphthalene	510.8	6.6	656.5	0	77.8	40-105	0
Nitrobenzene	565.9	160	656.5	0	86.2	40-115	0
N-Nitrosodimethylamine	542.9	160	656.5	0	82.7	20-115	0
N-Nitrosodi-n-propylamine	556.4	32	656.5	0	84.7	40-115	0
N-Nitrosodiphenylamine	683.1	32	656.5	0	104	50-115	0
Pentachlorophenol	617.5	32	656.5	0	94	25-120	0
Phenanthrene	602.4	6.6	656.5	0	91.7	50-110	0
Phenol	622	32	656.5	0	94.7	40-100	0
Pyrene	692.9	6.6	656.5	0	106	45-125	0
Surr: 2,4,6-Tribromophenol	*1540*	0	*1641*	0	*93.8*	*34-140*	0
Surr: 2-Fluorobiphenyl	*1191*	0	*1641*	0	*72.5*	*12-100*	0
Surr: 2-Fluorophenol	*1406*	0	*1641*	0	*85.7*	*33-117*	0
Surr: 4-Terphenyl-d14	*1617*	0	*1641*	0	*98.5*	*25-137*	0
Surr: Nitrobenzene-d5	*1372*	0	*1641*	0	*83.6*	*37-107*	0
Surr: Phenol-d6	*1358*	0	*1641*	0	*82.7*	*40-106*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85523** Instrument ID **SVMS8** Method: **SW8270C**

MSD Sample ID: **1605001-02C MSD** Units: **µg/Kg** Analysis Date: **5/3/2016 06:32 PM**

Client ID: Run ID: **SVMS8_160503A** SeqNo: **3810225** Prep Date: **5/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	608.2	33	660	0	92.1	55-115	667.7	9.32	30	
2,4,6-Trichlorophenol	500.9	33	660	0	75.9	45-110	554.8	10.2	30	
2,4-Dichlorophenol	535.3	33	660	0	81.1	45-110	579	7.86	30	
2,4-Dimethylphenol	496.7	33	660	0	75.2	30-105	545.6	9.39	30	
2,4-Dinitrophenol	383.1	33	660	0	58	15-130	484.5	23.4	30	
2,4-Dinitrotoluene	502.9	33	660	0	76.2	50-115	541	7.29	30	
2,6-Dinitrotoluene	489.7	33	660	0	74.2	50-110	530.1	7.93	30	
2-Chloronaphthalene	461	6.6	660	0	69.8	45-105	489.8	6.05	30	
2-Chlorophenol	566.6	33	660	0	85.8	45-105	557.4	1.64	30	
2-Nitrophenol	552.1	33	660	0	83.6	40-110	593.8	7.28	30	
3,3´-Dichlorobenzidine	537.6	170	660	0	81.4	30-120	578.1	7.26	30	
4,6-Dinitro-2-methylphenol	547.5	33	660	0	82.9	40-130	618.1	12.1	30	
4-Bromophenyl phenyl ether	625.7	33	660	0	94.8	45-115	697.5	10.9	30	
4-Chloro-3-methylphenol	540.9	33	660	0	81.9	45-115	586.9	8.17	30	
4-Chlorophenyl phenyl ether	477.8	33	660	0	72.4	45-110	528.2	10	30	
4-Nitrophenol	444.2	33	660	0	67.3	15-140	480.9	7.94	30	
Acenaphthene	462.3	6.6	660	0	70	45-110	499.3	7.68	30	
Acenaphthylene	491	6.6	660	0	74.4	45-105	522.3	6.16	30	
Anthracene	586.4	6.6	660	0	88.8	55-105	649.6	10.2	30	
Benzo(a)anthracene	577.2	6.6	660	0	87.4	50-110	633.9	9.36	30	
Benzo(a)pyrene	676.5	6.6	660	0	102	50-110	763.9	12.1	30	
Benzo(b)fluoranthene	669.9	6.6	660	0	101	45-115	730	8.59	30	
Benzo(g,h,i)perylene	698	6.6	660	0	106	40-125	760.6	8.59	30	
Benzo(k)fluoranthene	666.9	6.6	660	0	101	45-115	718.9	7.5	30	
Bis(2-chloroethoxy)methane	504.9	33	660	0	76.5	45-110	537.7	6.29	30	
Bis(2-chloroethyl)ether	539.9	33	660	0	81.8	40-105	535.4	0.836	30	
Bis(2-chloroisopropyl)ether	570.6	33	660	0	86.4	20-115	556.4	2.52	30	
Bis(2-ethylhexyl)phthalate	571.9	33	660	239	50.4	45-125	634.8	10.4	30	
Butyl benzyl phthalate	633.3	33	660	0	95.9	50-125	701.8	10.3	30	
Chrysene	576.2	6.6	660	0	87.3	55-110	610.2	5.74	30	
Dibenzo(a,h)anthracene	650.1	6.6	660	0	98.5	40-125	700.5	7.46	30	
Diethyl phthalate	491.7	33	660	0	74.5	50-115	523.9	6.34	30	
Dimethyl phthalate	487.1	33	660	0	73.8	50-110	528.2	8.09	30	
Di-n-butyl phthalate	600.3	33	660	0	90.9	55-110	652.6	8.35	30	
Di-n-octyl phthalate	678.5	33	660	0	103	40-130	726.4	6.83	30	
Fluoranthene	576.2	6.6	660	0	87.3	55-115	630.3	8.96	30	
Fluorene	495.7	6.6	660	0	75.1	50-110	532.1	7.09	30	
Hexachlorobenzene	611.8	33	660	0	92.7	45-120	652.9	6.5	30	
Hexachlorobutadiene	515.5	33	660	0	78.1	40-115	550.2	6.51	30	
Hexachlorocyclopentadiene	507.9	33	660	0	76.9	40-115	514.7	1.34	30	
Hexachloroethane	540.9	33	660	0	81.9	35-110	534.1	1.26	30	
Indeno(1,2,3-cd)pyrene	720.4	6.6	660	0	109	40-120	772.4	6.97	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **85523** Instrument ID **SVMS8** Method: **SW8270C**

Isophorone	494.7	170	660	0	74.9	45-110	524.9	5.93	30
Naphthalene	486.8	6.6	660	0	73.7	40-105	510.8	4.82	30
Nitrobenzene	532.3	170	660	0	80.6	40-115	565.9	6.12	30
N-Nitrosodimethylamine	521.1	170	660	0	78.9	20-115	542.9	4.11	30
N-Nitrosodi-n-propylamine	598.3	33	660	0	90.6	40-115	556.4	7.26	30
N-Nitrosodiphenylamine	621.4	33	660	0	94.1	50-115	683.1	9.46	30
Pentachlorophenol	530.6	33	660	0	80.4	25-120	617.5	15.1	30
Phenanthrene	551.1	6.6	660	0	83.5	50-110	602.4	8.89	30
Phenol	599.3	33	660	0	90.8	40-100	622	3.73	30
Pyrene	653.4	6.6	660	0	99	45-125	692.9	5.87	30
Surr: 2,4,6-Tribromophenol	*1437*	0	*1650*	0	*87.1*	*34-140*	1540	*6.94*	*40*
Surr: 2-Fluorobiphenyl	*1135*	0	*1650*	0	*68.8*	*12-100*	1191	*4.82*	*40*
Surr: 2-Fluorophenol	*1416*	0	*1650*	0	*85.8*	*33-117*	1406	*0.693*	*40*
Surr: 4-Terphenyl-d14	*1532*	0	*1650*	0	*92.8*	*25-137*	1617	*5.39*	*40*
Surr: Nitrobenzene-d5	*1275*	0	*1650*	0	*77.3*	*37-107*	1372	*7.33*	*40*
Surr: Phenol-d6	*1343*	0	*1650*	0	*81.4*	*40-106*	1358	*1.1*	*40*

The following samples were analyzed in this batch: 16041611-01B, 16041611-02B, 16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85413** Instrument ID **VMS8** Method: **SW8260B**

MBLK	Sample ID: **MBLK-85413-85413**				Units: **µg/Kg-dry**		Analysis Date: **4/30/2016 01:49 PM**			
Client ID:		Run ID: **VMS8_160430A**			SeqNo: **3804459**		Prep Date: **4/29/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	U	30								
1,1,2,2-Tetrachloroethane	U	30								
1,1,2-Trichloroethane	U	30								
1,1-Dichloroethane	U	30								
1,1-Dichloroethene	U	30								
1,2-Dichlorobenzene	U	30								
1,2-Dichloroethane	U	30								
1,2-Dichloropropane	U	30								
1,3-Dichlorobenzene	U	30								
1,4-Dichlorobenzene	U	30								
Acrolein	U	200								
Acrylonitrile	U	100								
Benzene	U	30								
Bromodichloromethane	U	30								
Bromoform	U	30								
Bromomethane	U	75								
Carbon tetrachloride	U	30								
Chlorobenzene	U	30								
Chloroethane	U	100								
Chloroform	U	30								
Chloromethane	U	100								
cis-1,2-Dichloroethene	U	30								
cis-1,3-Dichloropropene	U	30								
Dibromochloromethane	U	30								
Ethylbenzene	U	30								
Methylene chloride	U	30								
Tetrachloroethene	U	30								
Toluene	U	30								
trans-1,2-Dichloroethene	U	30								
trans-1,3-Dichloropropene	U	30								
Trichloroethene	U	30								
Vinyl chloride	U	30								
Surr: 1,2-Dichloroethane-d4	*1074*	0	*1000*	0	*107*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*897.5*	0	*1000*	0	*89.8*	*70-130*	0			
Surr: Dibromofluoromethane	*927*	0	*1000*	0	*92.7*	*70-130*	0			
Surr: Toluene-d8	*965.5*	0	*1000*	0	*96.6*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85413** Instrument ID **VMS8** Method: **SW8260B**

LCS Sample ID: **LCS-85413-85413** Units: **µg/Kg-dry** Analysis Date: **4/30/2016 12:11 PM**
Client ID: Run ID: **VMS8_160430A** SeqNo: **3804458** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	1100	30	1000	0	110	70-135	0			
1,1,2,2-Tetrachloroethane	931	30	1000	0	93.1	55-130	0			
1,1,2-Trichloroethane	987	30	1000	0	98.7	60-125	0			
1,1-Dichloroethane	1068	30	1000	0	107	75-125	0			
1,1-Dichloroethene	1143	30	1000	0	114	65-135	0			
1,2-Dichlorobenzene	994	30	1000	0	99.4	75-120	0			
1,2-Dichloroethane	1032	30	1000	0	103	70-135	0			
1,2-Dichloropropane	1007	30	1000	0	101	70-120	0			
1,3-Dichlorobenzene	1230	30	1000	0	123	70-125	0			
1,4-Dichlorobenzene	1050	30	1000	0	105	70-125	0			
Acrylonitrile	847.5	100	1000	0	84.8	70-135	0			
Benzene	1064	30	1000	0	106	75-125	0			
Bromodichloromethane	1060	30	1000	0	106	70-130	0			
Bromoform	909.5	30	1000	0	91	55-135	0			
Bromomethane	1200	75	1000	0	120	30-160	0			
Carbon tetrachloride	1140	30	1000	0	114	65-135	0			
Chlorobenzene	1018	30	1000	0	102	75-125	0			
Chloroethane	1264	100	1000	0	126	40-155	0			
Chloroform	1012	30	1000	0	101	70-125	0			
Chloromethane	1023	100	1000	0	102	50-130	0			
cis-1,2-Dichloroethene	1116	30	1000	0	112	65-125	0			
cis-1,3-Dichloropropene	1036	30	1000	0	104	70-125	0			
Dibromochloromethane	930.5	30	1000	0	93	65-135	0			
Ethylbenzene	1122	30	1000	0	112	75-125	0			
Methylene chloride	1057	30	1000	0	106	55-145	0			
Tetrachloroethene	1228	30	1000	0	123	64-140	0			
Toluene	1022	30	1000	0	102	70-125	0			
trans-1,2-Dichloroethene	1080	30	1000	0	108	65-135	0			
trans-1,3-Dichloropropene	1008	30	1000	0	101	65-125	0			
Trichloroethene	1061	30	1000	0	106	75-125	0			
Vinyl chloride	1186	30	1000	0	119	60-125	0			
Surr: 1,2-Dichloroethane-d4	*1011*	0	*1000*	0	*101*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*1014*	0	*1000*	0	*101*	*70-130*	0			
Surr: Dibromofluoromethane	*1008*	0	*1000*	0	*101*	*70-130*	0			
Surr: Toluene-d8	*995.5*	0	*1000*	0	*99.6*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85413** Instrument ID **VMS8** Method: **SW8260B**

MS Sample ID: **16041634-15A MS** Units: **µg/Kg-dry** Analysis Date: **5/5/2016 09:16 AM**
Client ID: Run ID: **VMS6_160504B** SeqNo: **3812153** Prep Date: **4/29/2016** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	35710	830	27620	0	129	70-135	0			
1,1,2,2-Tetrachloroethane	27040	830	27620	0	97.9	55-130	0			
1,1,2-Trichloroethane	32550	830	27620	0	118	60-125	0			
1,1-Dichloroethane	32400	830	27620	0	117	75-125	0			
1,1-Dichloroethene	31490	830	27620	0	114	65-135	0			
1,2-Dichlorobenzene	30770	830	27620	0	111	75-120	0			
1,2-Dichloroethane	31320	830	27620	0	113	70-135	0			
1,2-Dichloropropane	32830	830	27620	0	119	70-120	0			
1,3-Dichlorobenzene	30890	830	27620	0	112	70-125	0			
1,4-Dichlorobenzene	29770	830	27620	0	108	70-125	0			
Acrylonitrile	21110	2,800	27620	0	76.4	70-135	0			
Benzene	34700	830	27620	0	126	75-125	0			S
Bromodichloromethane	30740	830	27620	0	111	70-130	0			
Bromoform	23450	830	27620	0	84.9	55-135	0			
Bromomethane	43710	2,100	27620	0	158	30-160	0			
Carbon tetrachloride	32910	830	27620	0	119	65-135	0			
Chlorobenzene	33240	830	27620	0	120	75-125	0			
Chloroethane	37190	2,800	27620	0	135	40-155	0			
Chloroform	31550	830	27620	0	114	70-125	0			
Chloromethane	38690	2,800	27620	0	140	50-130	0			S
cis-1,2-Dichloroethene	29070	830	27620	0	105	65-125	0			
cis-1,3-Dichloropropene	32110	830	27620	0	116	70-125	0			
Dibromochloromethane	26130	830	27620	0	94.6	65-135	0			
Ethylbenzene	34580	830	27620	5855	104	75-125	0			
Methylene chloride	30820	830	27620	0	112	55-145	0			
Tetrachloroethene	57790	830	27620	0	209	64-140	0			S
Toluene	33640	830	27620	0	122	70-125	0			
trans-1,2-Dichloroethene	32040	830	27620	0	116	65-135	0			
trans-1,3-Dichloropropene	25800	830	27620	0	93.4	65-125	0			
Trichloroethene	38500	830	27620	0	139	75-125	0			S
Vinyl chloride	37120	830	27620	0	134	60-125	0			S
Surr: 1,2-Dichloroethane-d4	*25420*	0	*27620*	0	*92*	*70-130*	0			
Surr: 4-Bromofluorobenzene	*26210*	0	*27620*	0	*94.9*	*70-130*	0			
Surr: Dibromofluoromethane	*26940*	0	*27620*	0	*97.6*	*70-130*	0			
Surr: Toluene-d8	*26930*	0	*27620*	0	*97.5*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85413** Instrument ID **VMS8** Method: **SW8260B**

MSD Sample ID: **16041634-15A MSD** Units: **µg/Kg-dry** Analysis Date: **5/5/2016 09:42 AM**

Client ID: Run ID: **VMS6_160504B** SeqNo: **3812155** Prep Date: **4/29/2016** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	30700	830	27620	0	111	70-135	35710	15.1	30	
1,1,2,2-Tetrachloroethane	26110	830	27620	0	94.6	55-130	27040	3.48	30	
1,1,2-Trichloroethane	29060	830	27620	0	105	60-125	32550	11.3	30	
1,1-Dichloroethane	28600	830	27620	0	104	75-125	32400	12.5	30	
1,1-Dichloroethene	27660	830	27620	0	100	65-135	31490	12.9	30	
1,2-Dichlorobenzene	26640	830	27620	0	96.4	75-120	30770	14.4	30	
1,2-Dichloroethane	27120	830	27620	0	98.2	70-135	31320	14.4	30	
1,2-Dichloropropane	29750	830	27620	0	108	70-120	32830	9.84	30	
1,3-Dichlorobenzene	26790	830	27620	0	97	70-125	30890	14.2	30	
1,4-Dichlorobenzene	26290	830	27620	0	95.2	70-125	29770	12.4	30	
Acrylonitrile	18750	2,800	27620	0	67.9	70-135	21110	11.8	30	S
Benzene	30150	830	27620	0	109	75-125	34700	14.1	30	
Bromodichloromethane	26580	830	27620	0	96.2	70-130	30740	14.5	30	
Bromoform	21690	830	27620	0	78.6	55-135	23450	7.77	30	
Bromomethane	41690	2,100	27620	0	151	30-160	43710	4.72	30	
Carbon tetrachloride	29390	830	27620	0	106	65-135	32910	11.3	30	
Chlorobenzene	28720	830	27620	0	104	75-125	33240	14.6	30	
Chloroethane	31710	2,800	27620	0	115	40-155	37190	15.9	30	
Chloroform	27150	830	27620	0	98.3	70-125	31550	15	30	
Chloromethane	33500	2,800	27620	0	121	50-130	38690	14.4	30	
cis-1,2-Dichloroethene	25290	830	27620	0	91.6	65-125	29070	13.9	30	
cis-1,3-Dichloropropene	27380	830	27620	0	99.2	70-125	32110	15.9	30	
Dibromochloromethane	23660	830	27620	0	85.6	65-135	26130	9.93	30	
Ethylbenzene	30260	830	27620	5855	88.4	75-125	34580	13.3	30	
Methylene chloride	26280	830	27620	0	95.2	55-145	30820	15.9	30	
Tetrachloroethene	48440	830	27620	0	175	64-140	57790	17.6	30	S
Toluene	29180	830	27620	0	106	70-125	33640	14.2	30	
trans-1,2-Dichloroethene	27200	830	27620	0	98.5	65-135	32040	16.3	30	
trans-1,3-Dichloropropene	22950	830	27620	0	83.1	65-125	25800	11.7	30	
Trichloroethene	30860	830	27620	0	112	75-125	38500	22	30	
Vinyl chloride	32650	830	27620	0	118	60-125	37120	12.8	30	
Surr: 1,2-Dichloroethane-d4	*24840*	0	*27620*	0	*90*	*70-130*	25420	*2.31*	*30*	
Surr: 4-Bromofluorobenzene	*26710*	0	*27620*	0	*96.7*	*70-130*	26210	*1.88*	*30*	
Surr: Dibromofluoromethane	*27480*	0	*27620*	0	*99.5*	*70-130*	26940	*1.98*	*30*	
Surr: Toluene-d8	*27370*	0	*27620*	0	*99.1*	*70-130*	26930	*1.63*	*30*	

The following samples were analyzed in this batch:

16041611-01A	16041611-02A	16041611-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85374** Instrument ID **WETCHEM** Method: **A5210B-97**

MBLK Sample ID: **MBLK-85374-85374** Units: **mg/Kg** Analysis Date: **5/4/2016 10:00 AM**
Client ID: Run ID: **WETCHEM_160504D** SeqNo: **3809406** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	U	20								

LCS Sample ID: **LCS-85374-85374** Units: **mg/Kg** Analysis Date: **5/4/2016 10:00 AM**
Client ID: Run ID: **WETCHEM_160504D** SeqNo: **3809407** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	1781	20	1980	0	90	85-115	0			

DUP Sample ID: **16041611-03B DUP** Units: **mg/Kg** Analysis Date: **5/4/2016 10:00 AM**
Client ID: **RCK001:E3:D000160** Run ID: **WETCHEM_160504D** SeqNo: **3809411** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	24.9	9.9	0	0	0		27.41	9.6	20	

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85405** Instrument ID **LACHAT** Method: **A4500-NH3 G-97**

MBLK Sample ID: **MBLK-85405-85405** Units: **mg/Kg** Analysis Date: **5/2/2016 01:22 PM**
Client ID: Run ID: **LACHAT_160502B** SeqNo: **3805058** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	2.36	5.0								J

LCS Sample ID: **LCS-85405-85405** Units: **mg/Kg** Analysis Date: **5/2/2016 01:22 PM**
Client ID: Run ID: **LACHAT_160502B** SeqNo: **3805059** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	91.94	5.0	100	0	91.9	80-120	0			

MS Sample ID: **16041428-01A MS** Units: **mg/Kg** Analysis Date: **5/2/2016 01:22 PM**
Client ID: Run ID: **LACHAT_160502B** SeqNo: **3805061** Prep Date: **4/29/2016** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	14080	390	154.8	11590	1610	75-125	0			SO

MSD Sample ID: **16041428-01A MSD** Units: **mg/Kg** Analysis Date: **5/2/2016 01:22 PM**
Client ID: Run ID: **LACHAT_160502B** SeqNo: **3805062** Prep Date: **4/29/2016** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	13680	380	152	11590	1370	75-125	14080	2.89	35	SO

LCS2 Sample ID: **LCS2-85405-85405** Units: **mg/Kg** Analysis Date: **5/2/2016 01:22 PM**
Client ID: Run ID: **LACHAT_160502B** SeqNo: **3805067** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	98.96	5.0	100	0	99	80-120	0			

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85418** Instrument ID **LACHAT2** Method: **A4500-P E-97**

MBLK Sample ID: **MBLK-85418-85418** Units: **mg/Kg** Analysis Date: **4/29/2016 03:56 PM**
Client ID: Run ID: **LACHAT2_160429E** SeqNo: **3802974** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	U	1.0								

LCS Sample ID: **LCS-85418-85418** Units: **mg/Kg** Analysis Date: **4/29/2016 03:56 PM**
Client ID: Run ID: **LACHAT2_160429E** SeqNo: **3802975** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	9.582	1.0	10	0	95.8	90-110	0			

MS Sample ID: **16041611-01B MS** Units: **mg/Kg** Analysis Date: **4/29/2016 03:56 PM**
Client ID: **RCK001:E1:D000180** Run ID: **LACHAT2_160429E** SeqNo: **3802977** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	11.48	1.1	11.21	0.3554	99.2	90-110	0			

MSD Sample ID: **16041611-01B MSD** Units: **mg/Kg** Analysis Date: **4/29/2016 03:56 PM**
Client ID: **RCK001:E1:D000180** Run ID: **LACHAT2_160429E** SeqNo: **3802978** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	11.92	1.2	11.66	0.3554	99.3	90-110	11.48	3.79	20	

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85463** Instrument ID **LACHAT2** Method: **E353.2**

MBLK Sample ID: **MBLK-85463-85463** Units: **mg/Kg** Analysis Date: **5/2/2016 11:46 AM**
Client ID: Run ID: **LACHAT2_160502E** SeqNo: **3805635** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	U	1.0								

LCS Sample ID: **LCS-85463-85463** Units: **mg/Kg** Analysis Date: **5/2/2016 11:46 AM**
Client ID: Run ID: **LACHAT2_160502E** SeqNo: **3805636** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	50.22	1.0	50	0	100	80-120	0			

MS Sample ID: **16041428-01A MS** Units: **mg/Kg** Analysis Date: **5/2/2016 11:46 AM**
Client ID: Run ID: **LACHAT2_160502E** SeqNo: **3805665** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	44.4	0.95	47.44	2.129	89.1	75-125	0			

MSD Sample ID: **16041428-01A MSD** Units: **mg/Kg** Analysis Date: **5/2/2016 11:46 AM**
Client ID: Run ID: **LACHAT2_160502E** SeqNo: **3805666** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	45.6	0.93	46.73	2.129	93	75-125	44.4	2.66	35	

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85464** Instrument ID **LACHAT2** Method: **E353.2**

MBLK Sample ID: **MBLK-85464-85464** Units: **mg/Kg** Analysis Date: **5/2/2016 11:46 AM**
Client ID: Run ID: **LACHAT2_160502D** SeqNo: **3805605** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	U	1.0								

LCS Sample ID: **LCS-85464-85464** Units: **mg/Kg** Analysis Date: **5/2/2016 11:46 AM**
Client ID: Run ID: **LACHAT2_160502D** SeqNo: **3805606** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	50.72	1.0	50	0	101	80-120	0			

MS Sample ID: **16041610-01A MS** Units: **mg/Kg** Analysis Date: **5/2/2016 11:46 AM**
Client ID: Run ID: **LACHAT2_160502D** SeqNo: **3805608** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	53.62	1.1	55.31	0.4684	96.1	75-125	0			

MSD Sample ID: **16041610-01A MSD** Units: **mg/Kg** Analysis Date: **5/2/2016 11:46 AM**
Client ID: Run ID: **LACHAT2_160502D** SeqNo: **3805609** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	54.14	1.1	54.35	0.4684	98.8	75-125	53.62	0.973	35	

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85466** Instrument ID **WETCHEM** Method: **A4500-NO2 B**

MBLK Sample ID: **MBLK-85466-85466** Units: **mg/Kg** Analysis Date: **5/2/2016 12:00 PM**
Client ID: Run ID: **WETCHEM_160502G** SeqNo: **3804892** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	U	0.70								

LCS Sample ID: **LCS-85466-85466** Units: **mg/Kg** Analysis Date: **5/2/2016 12:00 PM**
Client ID: Run ID: **WETCHEM_160502G** SeqNo: **3804893** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	2.066	0.70	2	0	103	80-120	0			

MS Sample ID: **16041610-01A MS** Units: **mg/Kg** Analysis Date: **5/2/2016 12:00 PM**
Client ID: Run ID: **WETCHEM_160502G** SeqNo: **3804895** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	2.837	0.78	2.227	0	127	75-125	0			S

MSD Sample ID: **16041610-01A MSD** Units: **mg/Kg** Analysis Date: **5/2/2016 12:00 PM**
Client ID: Run ID: **WETCHEM_160502G** SeqNo: **3804896** Prep Date: **4/29/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	2.857	0.75	2.132	0	134	75-125	2.837	0.693	20	S

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85482** Instrument ID **LACHAT** Method: **SW9012B**

MBLK Sample ID: **MBLK-85482-85482** Units: **mg/Kg** Analysis Date: **5/2/2016 03:09 PM**
Client ID: Run ID: **LACHAT_160502C** SeqNo: **3805448** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	U	0.50								

MBLK Sample ID: **MBLK-85482-85482** Units: **mg/Kg** Analysis Date: **5/2/2016 03:09 PM**
Client ID: Run ID: **LACHAT_160502C** SeqNo: **3805471** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	U	0.50								

LCS Sample ID: **LCS-85482-85482** Units: **mg/Kg** Analysis Date: **5/2/2016 03:09 PM**
Client ID: Run ID: **LACHAT_160502C** SeqNo: **3805449** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.524	0.50	2.5	0	101	85-119		0		

LCS Sample ID: **LCS-85482-85482** Units: **mg/Kg** Analysis Date: **5/2/2016 03:09 PM**
Client ID: Run ID: **LACHAT_160502C** SeqNo: **3805472** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.524	0.50	2.5	0	101	85-119		0		

MS Sample ID: **1605001-02C MS** Units: **mg/Kg** Analysis Date: **5/2/2016 03:09 PM**
Client ID: Run ID: **LACHAT_160502C** SeqNo: **3805452** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.432	0.50	2.5	0	97.3	70-130		0		

MS Sample ID: **1605001-10C MS** Units: **mg/Kg** Analysis Date: **5/2/2016 03:09 PM**
Client ID: Run ID: **LACHAT_160502C** SeqNo: **3805464** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.52	0.49	2.461	0.1267	97.2	70-130		0		

MSD Sample ID: **1605001-02C MSD** Units: **mg/Kg** Analysis Date: **5/2/2016 03:09 PM**
Client ID: Run ID: **LACHAT_160502C** SeqNo: **3805453** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.475	0.51	2.541	0	97.4	70-130	2.432	1.74	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85482** Instrument ID **LACHAT** Method: **SW9012B**

MSD	Sample ID: **1605001-10C MSD**				Units: **mg/Kg**		Analysis Date: **5/2/2016 03:09 PM**			
Client ID:		Run ID: **LACHAT_160502C**			SeqNo: **3805465**		Prep Date: **5/2/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	2.402	0.49	2.441	0.1267	93.2	70-130	2.52	4.77	30	

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85485** Instrument ID **WETCHEM** Method: **SW9045D**

LCS Sample ID: **LCS-85485-85485** Units: **s.u.** Analysis Date: **5/2/2016 04:30 PM**
Client ID: Run ID: **WETCHEM_160502L** SeqNo: **3805295** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	3.99	0	4	0	99.8	90-110	0			

DUP Sample ID: **16041606-05B DUP** Units: **s.u.** Analysis Date: **5/2/2016 04:30 PM**
Client ID: Run ID: **WETCHEM_160502L** SeqNo: **3805303** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	8.67	0	0	0	0	0-0	8.73	0.69	20	

DUP Sample ID: **16041608-03B DUP** Units: **s.u.** Analysis Date: **5/2/2016 04:30 PM**
Client ID: Run ID: **WETCHEM_160502L** SeqNo: **3805309** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH	8.73	0	0	0	0	0-0	8.66	0.805	20	

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85507** Instrument ID **GALLERY** Method: **A4500-Cl E-97**

MBLK Sample ID: **MBLK-85507-85507** Units: **mg/Kg** Analysis Date: **5/3/2016 02:00 PM**
Client ID: Run ID: **GALLERY_160503D** SeqNo: **3807575** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	10								

MS Sample ID: **16041610-01A MS** Units: **mg/Kg** Analysis Date: **5/3/2016 02:00 PM**
Client ID: Run ID: **GALLERY_160503D** SeqNo: **3807577** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	646.3	9.9	497	196.9	90.4	75-125	0			

MSD Sample ID: **16041610-01A MSD** Units: **mg/Kg** Analysis Date: **5/3/2016 02:00 PM**
Client ID: Run ID: **GALLERY_160503D** SeqNo: **3807578** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	648.3	9.9	497	196.9	90.8	75-125	646.3	0.307	25	

LCS1 Sample ID: **LCS1-85507-85507** Units: **mg/Kg** Analysis Date: **5/3/2016 02:00 PM**
Client ID: Run ID: **GALLERY_160503D** SeqNo: **3807582** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	95.32	10	100	0	95.3	80-120	0			

LCS2 Sample ID: **LCS2-85507-85507** Units: **mg/Kg** Analysis Date: **5/3/2016 02:00 PM**
Client ID: Run ID: **GALLERY_160503D** SeqNo: **3807583** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	490.5	10	500	0	98.1	80-120	0			

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85541** Instrument ID **LACHAT2** Method: **E365.1 R2.0**

MBLK Sample ID: **MBLK-85541-85541** Units: **mg/Kg** Analysis Date: **5/3/2016 10:52 AM**
Client ID: Run ID: **LACHAT2_160503C** SeqNo: **3808512** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	U	5.0								

LCS Sample ID: **LCS-85541-85541** Units: **mg/Kg** Analysis Date: **5/3/2016 10:52 AM**
Client ID: Run ID: **LACHAT2_160503C** SeqNo: **3808513** Prep Date: **5/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	10.43	5.0	10	0	104	90-110	0			

MS Sample ID: **16041610-01A MS** Units: **mg/Kg** Analysis Date: **5/3/2016 10:52 AM**
Client ID: Run ID: **LACHAT2_160503C** SeqNo: **3808554** Prep Date: **5/2/2016** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	896.1	290	11.42	851	396	90-110	0			SO

MSD Sample ID: **16041610-01A MSD** Units: **mg/Kg** Analysis Date: **5/3/2016 10:52 AM**
Client ID: Run ID: **LACHAT2_160503C** SeqNo: **3808555** Prep Date: **5/2/2016** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	909.4	270	10.66	851	548	90-110	896.1	1.47	20	SO

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85559A** Instrument ID **LACHAT2** Method: **A4500-NH3 G-97**

MBLK Sample ID: **MBLK-85559-85559A** Units: **mg NH3-N/Kg** Analysis Date: **5/4/2016 11:54 AM**
Client ID: Run ID: **LACHAT2_160504E** SeqNo: **3810715** Prep Date: **5/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	U	15								

LCS Sample ID: **LCS-85559-85559A** Units: **mg NH3-N/Kg** Analysis Date: **5/4/2016 11:54 AM**
Client ID: Run ID: **LACHAT2_160504E** SeqNo: **3810716** Prep Date: **5/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	42.86	15	50	0	85.7	70-130	0			

MS Sample ID: **16041610-01A MS** Units: **mg NH3-N/Kg** Analysis Date: **5/4/2016 11:54 AM**
Client ID: Run ID: **LACHAT2_160504E** SeqNo: **3810718** Prep Date: **5/3/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	630.3	230	75.76	527.9	135	70-130	0			SO

MS Sample ID: **1605015-01A MS** Units: **mg NH3-N/Kg** Analysis Date: **5/4/2016 11:54 AM**
Client ID: Run ID: **LACHAT2_160504E** SeqNo: **3810746** Prep Date: **5/3/2016** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	1360	220	37.31	1248	302	70-130	0			SO

MSD Sample ID: **16041610-01A MSD** Units: **mg NH3-N/Kg** Analysis Date: **5/4/2016 11:54 AM**
Client ID: Run ID: **LACHAT2_160504E** SeqNo: **3810719** Prep Date: **5/3/2016** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	626.1	230	75.76	527.9	130	70-130	630.3	0.663	30	O

MSD Sample ID: **1605015-01A MSD** Units: **mg NH3-N/Kg** Analysis Date: **5/4/2016 11:54 AM**
Client ID: Run ID: **LACHAT2_160504E** SeqNo: **3810747** Prep Date: **5/3/2016** DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	1462	220	36.76	1248	584	70-130	1360	7.23	30	SO

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **85690** Instrument ID **WETCHEM** Method: **E410.4 R2.0**

MBLK Sample ID: **MB-R186873-85690** Units: **mg/Kg** Analysis Date: **5/5/2016 09:30 AM**
Client ID: Run ID: **WETCHEM_160505N** SeqNo: **3812734** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	U	500								

LCS Sample ID: **LCS-R186873-85690** Units: **mg/Kg** Analysis Date: **5/5/2016 09:30 AM**
Client ID: Run ID: **WETCHEM_160505N** SeqNo: **3812735** Prep Date: **5/4/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	6080	500	6000	0	101	90-110	0			

MS Sample ID: **16041611-01B MS** Units: **mg/Kg** Analysis Date: **5/5/2016 09:30 AM**
Client ID: **RCK001:E1:D000180** Run ID: **WETCHEM_160505N** SeqNo: **3812737** Prep Date: **5/4/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	9342	1,500	8876	62.76	105	80-120	0			

MSD Sample ID: **16041611-01B MSD** Units: **mg/Kg** Analysis Date: **5/5/2016 09:30 AM**
Client ID: **RCK001:E1:D000180** Run ID: **WETCHEM_160505N** SeqNo: **3812738** Prep Date: **5/4/2016** DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	9179	1,500	8721	62.76	105	80-120	9342	1.76	20	

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **R186401** Instrument ID **WETCHEM** Method: **TITRAMETRIC**

MBLK Sample ID: **WBLKS1-160429-R186401** Units: **% by wt** Analysis Date: **4/29/2016 09:33 AM**
Client ID: Run ID: **WETCHEM_160429C** SeqNo: **3801208** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	U	0.025								

LCS Sample ID: **WLCSS1-160429-R186401** Units: **% by wt** Analysis Date: **4/29/2016 09:33 AM**
Client ID: Run ID: **WETCHEM_160429C** SeqNo: **3801209** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	0.1287	0.025	0.1	0	129	91-143	0			

MS Sample ID: **16041611-01B MS** Units: **% by wt** Analysis Date: **4/29/2016 09:33 AM**
Client ID: **RCK001:E1:D000180** Run ID: **WETCHEM_160429C** SeqNo: **3801211** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	3.052	0.025	2.174	0.4653	119	91-143	0			

MSD Sample ID: **16041611-01B MSD** Units: **% by wt** Analysis Date: **4/29/2016 09:33 AM**
Client ID: **RCK001:E1:D000180** Run ID: **WETCHEM_160429C** SeqNo: **3801212** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon - W-B	3.343	0.025	2.381	0.4653	121	91-143	3.052	9.09	20	

The following samples were analyzed in this batch:

16041611-01B	16041611-02B	16041611-03B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 16041611
Project: RCK001 Lagoon E

QC BATCH REPORT

Batch ID: **R186511** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R186511** Units: **% of sample** Analysis Date: **4/29/2016 06:30 PM**
Client ID: Run ID: **MOIST_160429B** SeqNo: **3803548** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	U	0.050								

LCS Sample ID: **LCS-R186511** Units: **% of sample** Analysis Date: **4/29/2016 06:30 PM**
Client ID: Run ID: **MOIST_160429B** SeqNo: **3803547** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.050	100	0	100	99.5-100.5	0			

DUP Sample ID: **16041580-01A DUP** Units: **% of sample** Analysis Date: **4/29/2016 06:30 PM**
Client ID: Run ID: **MOIST_160429B** SeqNo: **3803526** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	15.12	0.050	0	0	0		14.89	1.53	20	

DUP Sample ID: **16041618-01B DUP** Units: **% of sample** Analysis Date: **4/29/2016 06:30 PM**
Client ID: Run ID: **MOIST_160429B** SeqNo: **3803542** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	14.98	0.050	0	0	0		14.87	0.737	20	

The following samples were analyzed in this batch:

16041611-01C	16041611-02C	16041611-03C

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1COC-11C011

PAGE 1 OF 1

HULL

CHAIN OF CUSTODY RECORD

NO. 1433

Dublin, OH	Indianapolis, IN	Mason, OH	Bedford, OH	Toledo, OH	St. Clairsville, OH	Pittsburgh, PA
6397 Emerald Pkwy	8445 Keystone Crossing	4770 Duke Dr.	4 Hemisphere Way	3401 Glendale Ave.	146 W. Main St.	Campbells Run Business Center
Suite 200	Suite 135	Suite 300	Bedford, OH 44146	Suite 300	2nd Floor	300 Business Center Dr., Suite 320
Dublin, OH 43016	Indianapolis, IN 46240	Mason, OH 45040	P: (440) 232-9945	Toledo, OH 43614	St. Clairsville, OH 43950	Pittsburgh, PA 15205
P: (614) 793-8777	P: (800) 241-7173	P: (513) 459-9677		P: (419) 385-2018	P: (800) 241-7173	P: (412) 448-0315

REPORT TO: Matt Bell

Client: Rocky Ridge Dev
Site: City of Toledo WTP
Project #: Lagoon E Phase:
Samplers: Scott Stanley
Purchase Order #

SAMPLE MATRIX
AA-AMBIENT AIR
C-ASBESTOS
D-SEDIMENT
G-GROUNDWATER
IA-INDOOR AIR
L-LEACHATE
P-PRODUCT
S-SOIL
SG-SOIL GAS
SS-SUBSLAB VAPOR
W-WATER
X-CONCRETE

PRESERVATIVES
A-Cool only, <4 deg. C
B-HNO_3 pH<2
C-H_2SO_4 pH<2
D-NaOH pH>12
E-ZnAcetate + NaOH, pH>9
F-$Na_2S_2O_3$ (0.008%)
G-HCL pH <2
H-EDTA
I-5ml 1:1 HCL
J-none
K-Stored in dark
L-NH_4Cl
M-Methanol
S-Sodium

METALS
N - Not filtered
F45u- filtered with 0.45 micron
F5u- filtered with 5 micron

ANALYSES / PRESERVATIVES

See attached list

PROJECT NO. : SAMPLE LOCATION	SAMPLE MATRIX & ID	NO. OF CONT.	SAMPLE TYPE (discrete, composite)	COLLECTION DATE/TIME	METALS	COMMENTS
RCL001 : E1	D000180	5	Composite	4-26-16 / 16:30		
RCL001 : E2	D000160	5	Composite	4-26-16 / 16:30		
RCL001 : E3	D000160	5	Composite	4-26-16 / 16:30		

RELINQUISHED BY: Scott Stanley	DATE: 4-27-16	RECEIVED BY: [signature]	DATE: 4-27-16	Deliver To:	ALS-Holland
	TIME: 9:30		TIME: 0930		
RELINQUISHED BY: [signature]	DATE: 4-27-16	RECEIVED BY: Fed Ex	DATE: 4-27-16	Method of Delivery:	Fed Ex
	TIME: 1700		TIME: 1700	Airbill Number:	
RELINQUISHED BY:	DATE:	RECEIVED BY: [signature]	DATE: 4/28/16	Regulatory Program:	Ohio VAP, Region 9 RSLs
	TIME:		TIME: 930	Required Limits:	

COOLER TEMPERATURE AS RECEIVED °C

DISTRIBUTION: WHITE -LAB USE (MUST BE RETURNED WITH REPORT); YELLOW -LAB USE; PINK -RETAINED BY HULL

NOTES: See Attached Analyte List.

TURN AROUND TIME: Std. DAYS

COC

Table 1
Summary of Totals and Geotechnical Analyses for Spent Lime

Chemical Sampling Parameter	Lab Chemical Sampling Method	# of Samples	Applicable Target Standards
pH	SW9045D	3 composite samples per lagoon (9 total samples); Chemical Only - 1 Duplicate Sample and 1 Field/Equipment Blank	1. Ohio Voluntary Action Program (VAP) - Residential Category 2. USEPA Region 9 Regional Screening Levels - Residential Category 3. Ohio Background Metals (Cox and Colvin)
Organic Carbon - Walkley-Black	TITRAMETRIC		
Chemical Oxygen Demand	E410.4 R2.0		
Biochemical Oxygen Demand	A5210B-97		
Chloride	A4500-Cl E-97		
Metals by ICP-MS Na, Mg, K	SW6020A		
Nitrogen, Total Kjeldahl	A4500-NH3 G-97		
Nitrogen, Total	Calculation		
Nitrogen, Total Inorganic	Calculation		
Nitrogen, Total Organic	Calculation		
Nitrogen, Nitrite	A4500-NO2 B		
Nitrogen, Nitrate	E353.2		
Nitrogen, Nitrate-Nitrite	E353.2		
Ammonia as Nitrogen	A4500-NH3 G-97		
Phosphorus, Total	E365.1 R2.0		
Phosphorus, Ortho-P (As P)	A4500-P E-97		
Priority Pollutant VOCs	SW8260B		
Priority Pollutant SVOCs	SW8270C		
PCBs	SW8082		
Priority Pollutant Pesticides	SW8081A		
Cyanide, Total	SW9012B		
Metals by ICP-MS	SW6020A		
Priority Pollutant Metals, Mercury by CVAA	SW7471A		
Geotechnical Sampling Parameter	**Geotechnical Sampling Method**		**Applicable Target Standards**
USCS: Particle Size	ASTM D2487 / ASTM D422		Not Applicable
Moisture Content by Mass	ASTM D2216		
Liquid Limit	ASTM D4318		
Plastic Limit			

Notes

1. Rocky Ridge will collect, pack, and ship 3 composite samples from each lagoon to the analytical laboratory. Each composite sample will characterize the entire depth of lime material. See Figure 2 for proposed sampling locations.

2. Rocky Ridge will collect five (5) buckets of the lime from each lagoon (15 total buckets) for use in preparing lime/soil blends for further testing. Each lagoon should be appropriately labeled (e.g., Lagoon D-1, Lagoon D-2, etc.)

3. Rocky Ridge will be responsible for all data collection, field reports and general documentation of field activities during the lime characterization.

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **HULL&ASSOC-TOLEDO** Date/Time Received: **28-Apr-16 09:30**

Work Order: **16041611** Received by: **MEB**

Checklist completed by Meghan Broadbent (eSignature) 28-Apr-16 (Date) Reviewed by: Bill Carey (eSignature) 09-May-16 (Date)

Matrices: soil

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	6.0/6.0	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	4/28/2016 3:36:20 PM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

10-Jun-2016

Matt Beil
Hull & Associates, Inc.
3401 Glendale Ave
Suite 300
Toledo, OH 43614

Re: **RCK001** Work Order: **1606036**

Dear Matt,

ALS Environmental received 3 samples on 01-Jun-2016 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 82.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Certificate No: OH: CL 103

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185
ALS GROUP USA, CORP Part of the ALS Laboratory Group A Campbell Brothers Limited Company

ALS Group USA, Corp

Date: 10-Jun-16

Client: Hull & Associates, Inc.
Project: RCK001
Work Order: **1606036**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1606036-01	RCK001:33/66:SB16-1162-3	Splp Extract	33/66	5/16/2016 13:30	5/17/2016 09:00	☐
1606036-02	RCK001:50/50:SB16-1160-1	Splp Extract	50/50	5/16/2016 12:30	5/17/2016 09:00	☐
1606036-03	RCK001:66/33:SB16-1161-3	Splp Extract	66/33	5/16/2016 13:00	5/17/2016 09:00	☐

ALS Group USA, Corp

Date: 10-Jun-16

Client: Hull & Associates, Inc.
Project: RCK001
WorkOrder: **1606036**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and PQL, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
µg/L	Micrograms per Liter
mg NH3-N/L	Milligrams Ammonia-Nitrogen per Liter
mg/L	Milligrams per Liter
s.u.	Standard Units

Client: Hull & Associates, Inc.
Project: RCK001
Work Order: 1606036

Case Narrative

Samples for the above noted Work Order were received on 6/1/2016. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting.

With the following exceptions, all sample analyses achieved analytical criteria.

Volatile Organics:
Samples for SPLP were extracted past hold time.

Extractable Organics:
Batch 86800, Method SVO_8270C_OVAP_W, Sample 1606036-01A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch 86800, Method SVO_8270C_OVAP_W, Sample 1606036-01A: Surrogate high due to matrix interference. Phenol-d6

Batch 86802, Method PCB_8082_OVAP_W, Sample 1606036-01A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch 86803, Method PEST_8081A_OVAP_W, Sample 1606036-01A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch 86859, Method SVO_8270C_OVAP_W, Sample 1606036-02A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch 86859, Method SVO_8270C_OVAP_W, Sample 1606036-03A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered

estimated.

Batch 86860, Method PCB_8082_OVAP_W, Sample 1606036-02A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch 86860, Method PCB_8082_OVAP_W, Sample 1606036-03A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch 86862, Method PEST_8081A_OVAP_W, Sample 1606036-02A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch 86862, Method PEST_8081A_OVAP_W, Sample 1606036-03A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch 86862, Method PEST_8081A_OVAP_W, Sample PLCSDW1-86862: The LCSD recovery was below the lower control limit. The sample results may be biased low for this analyte: Aldrin

Batch 86862, Method PEST_8081A_OVAP_W, Sample PLCSW1-86862: The LCS recovery was below the lower control limit. The sample results for this analyte may be biased low for this analyte: Aldrin

Metals:
No other deviations or anomalies were noted.

Wet Chemistry:
Batch 86849, Method BOD_5210B_W, Sample 1606036-01A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated. BOD

Batch 86905, Method BOD_5210B_W, Sample 1606036-02A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated. BOD

Batch 86905, Method BOD_5210B_W, Sample 1606036-03A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated. BOD

Batch R188767, Method PO4_4500E_W, Sample 1606036-01A: Sample holding time expired before receipt by laboratory.

Batch R188776, Method PH_9040_W, Sample 1606036-01A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch R188785, Method NO2_4500B_W, Sample 1606036-01A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch R188868, Method NO2_4500B_W, Sample 1606036-02A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch R188868, Method NO2_4500B_W, Sample 1606036-03A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch R188874b, Method PH_9040_W, Sample 1606036-02A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch R188874b, Method PH_9040_W, Sample 1606036-03A: Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch R188897, Method NO32_353.2_W, Sample 1606036-01A: Sample holding time expired before receipt by laboratory.

Batch R188902, Method PO4_4500E_W, Sample 1606036-02A: Sample holding time expired before receipt by laboratory.

Batch R188902, Method PO4_4500E_W, Sample 1606036-03A: Sample holding time expired before receipt by laboratory.

Batch R189038, Method COD_410.4LL_W, Sample 1606036-02A MS: The MS recovery was below the lower control limit. The corresponding result in the parent sample may be biased low for this analyte.

Batch R189038, Method COD_410.4LL_W, Sample 1606036-02A MSD: The MSD recovery was below the lower control limit. The corresponding result in the parent sample may be biased low for this analyte.

Batch R189076, Method NO32_353.2_W, Sample 1606036-02A: Sample holding time expired before receipt by laboratory.

Batch R189076, Method NO32_353.2_W, Sample 1606036-03A: Sample holding time expired

before receipt by laboratory.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-3
Collection Date: 5/16/2016 01:30 PM

Work Order: 1606036
Lab ID: 1606036-01
Matrix: SPLP EXTRACT

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3510 / 6/2/16		Analyst: **EB**
Aroclor 1016	U	H	0.062	0.26	µg/L	1	6/3/2016 21:25
Aroclor 1221	U	H	0.062	0.26	µg/L	1	6/3/2016 21:25
Aroclor 1232	U	H	0.062	0.26	µg/L	1	6/3/2016 21:25
Aroclor 1242	U	H	0.062	0.26	µg/L	1	6/3/2016 21:25
Aroclor 1248	U	H	0.062	0.26	µg/L	1	6/3/2016 21:25
Aroclor 1254	U	H	0.040	0.26	µg/L	1	6/3/2016 21:25
Aroclor 1260	U	H	0.040	0.26	µg/L	1	6/3/2016 21:25
Surr: Decachlorobiphenyl	*67.0*			*40-110*	*%REC*	1	6/3/2016 21:25
Surr: Tetrachloro-m-xylene	*59.0*			*40-110*	*%REC*	1	6/3/2016 21:25
PESTICIDES		Method: **SW8081A**			Prep: SW3510C / 6/2/16		Analyst: **BLM**
4,4´-DDD	U	H	0.0016	0.026	µg/L	1	6/4/2016 03:38
4,4´-DDE	U	H	0.0022	0.026	µg/L	1	6/4/2016 03:38
4,4´-DDT	U	H	0.0022	0.026	µg/L	1	6/4/2016 03:38
Aldrin	U	H	0.0036	0.013	µg/L	1	6/4/2016 03:38
alpha-BHC	U	H	0.0016	0.013	µg/L	1	6/4/2016 03:38
beta-BHC	U	H	0.0086	0.013	µg/L	1	6/4/2016 03:38
Chlordane, Technical	U	H	0.044	0.65	µg/L	1	6/4/2016 03:38
delta-BHC	U	H	0.0034	0.013	µg/L	1	6/4/2016 03:38
Dieldrin	U	H	0.0029	0.026	µg/L	1	6/4/2016 03:38
Endosulfan I	U	H	0.0022	0.026	µg/L	1	6/4/2016 03:38
Endosulfan II	U	H	0.0016	0.026	µg/L	1	6/4/2016 03:38
Endosulfan sulfate	U	H	0.0019	0.026	µg/L	1	6/4/2016 03:38
Endrin	U	H	0.0023	0.026	µg/L	1	6/4/2016 03:38
Endrin aldehyde	U	H	0.0036	0.026	µg/L	1	6/4/2016 03:38
gamma-BHC (Lindane)	U	H	0.0019	0.013	µg/L	1	6/4/2016 03:38
Heptachlor	U	H	0.0022	0.013	µg/L	1	6/4/2016 03:38
Heptachlor epoxide	U	H	0.0016	0.013	µg/L	1	6/4/2016 03:38
Toxaphene	U	H	0.14	2.6	µg/L	1	6/4/2016 03:38
Surr: Decachlorobiphenyl	*57.0*			*42-119*	*%REC*	1	6/4/2016 03:38
Surr: Tetrachloro-m-xylene	*50.0*			*32-104*	*%REC*	1	6/4/2016 03:38
MERCURY BY CVAA		Method: **SW7470A**			Prep: SW7470A / 6/2/16		Analyst: **LR**
Mercury	U		0.000019	0.00020	mg/L	1	6/2/2016 16:22
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3005A / 6/3/16		Analyst: **ML**
Magnesium	**9.8**		**0.0068**	**0.20**	**mg/L**	1	6/3/2016 23:27
Potassium	**0.89**		**0.017**	**0.20**	**mg/L**	1	6/3/2016 23:27
Sodium	**12**		**0.034**	**0.20**	**mg/L**	1	6/3/2016 23:27

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-3
Collection Date: 5/16/2016 01:30 PM

Work Order: 1606036
Lab ID: 1606036-01
Matrix: SPLP EXTRACT

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3005A / 6/3/16		Analyst: **ML**
Antimony	**0.00039**	J	**0.00017**	**0.0050**	**mg/L**	1	6/3/2016 23:27
Arsenic	**0.0019**	J	**0.00087**	**0.0050**	**mg/L**	1	6/3/2016 23:27
Beryllium	U		0.00012	0.0020	mg/L	1	6/3/2016 23:27
Cadmium	**0.000071**	J	**0.000050**	**0.0020**	**mg/L**	1	6/3/2016 23:27
Chromium	**0.00093**	J	**0.00065**	**0.0050**	**mg/L**	1	6/3/2016 23:27
Copper	**0.0049**	J	**0.00028**	**0.0050**	**mg/L**	1	6/3/2016 23:27
Lead	U		0.00033	0.0050	mg/L	1	6/3/2016 23:27
Nickel	**0.00063**	J	**0.00041**	**0.0050**	**mg/L**	1	6/3/2016 23:27
Selenium	U		0.00090	0.0050	mg/L	1	6/3/2016 23:27
Silver	U		0.000050	0.0050	mg/L	1	6/3/2016 23:27
Thallium	U		0.00016	0.0020	mg/L	1	6/3/2016 23:27
Zinc	**0.0042**	J	**0.0014**	**0.010**	**mg/L**	1	6/3/2016 23:27
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3510C / 6/2/16		Analyst: **JF**
1,2-Diphenylhydrazine	U	H	0.26	1.2	µg/L	1	6/2/2016 22:58
2,4,6-Trichlorophenol	U	H	0.29	1.2	µg/L	1	6/2/2016 22:58
2,4-Dichlorophenol	U	H	0.41	1.2	µg/L	1	6/2/2016 22:58
2,4-Dimethylphenol	U	H	0.42	1.2	µg/L	1	6/2/2016 22:58
2,4-Dinitrophenol	U	H	0.47	5.8	µg/L	1	6/2/2016 22:58
2,4-Dinitrotoluene	U	H	0.49	1.2	µg/L	1	6/2/2016 22:58
2,6-Dinitrotoluene	U	H	0.38	1.2	µg/L	1	6/2/2016 22:58
2-Chloronaphthalene	U	H	0.035	0.12	µg/L	1	6/2/2016 22:58
2-Chlorophenol	U	H	0.27	1.2	µg/L	1	6/2/2016 22:58
2-Nitrophenol	U	H	0.40	1.2	µg/L	1	6/2/2016 22:58
3,3´-Dichlorobenzidine	U	H	1.8	5.8	µg/L	1	6/2/2016 22:58
4,6-Dinitro-2-methylphenol	U	H	0.31	1.2	µg/L	1	6/2/2016 22:58
4-Bromophenyl phenyl ether	U	H	0.38	1.2	µg/L	1	6/2/2016 22:58
4-Chloro-3-methylphenol	U	H	0.30	1.2	µg/L	1	6/2/2016 22:58
4-Chlorophenyl phenyl ether	U	H	0.36	1.2	µg/L	1	6/2/2016 22:58
4-Nitrophenol	U	H	0.28	5.8	µg/L	1	6/2/2016 22:58
Acenaphthene	U	H	0.048	0.12	µg/L	1	6/2/2016 22:58
Acenaphthylene	U	H	0.045	0.12	µg/L	1	6/2/2016 22:58
Anthracene	U	H	0.033	0.12	µg/L	1	6/2/2016 22:58
Benzidine	U	H	2.3	5.8	µg/L	1	6/2/2016 22:58
Benzo(a)anthracene	U	H	0.084	0.12	µg/L	1	6/2/2016 22:58
Benzo(a)pyrene	U	H	0.042	0.12	µg/L	1	6/2/2016 22:58
Benzo(b)fluoranthene	U	H	0.050	0.12	µg/L	1	6/2/2016 22:58
Benzo(g,h,i)perylene	U	H	0.081	0.12	µg/L	1	6/2/2016 22:58
Benzo(k)fluoranthene	U	H	0.072	0.12	µg/L	1	6/2/2016 22:58

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-3
Collection Date: 5/16/2016 01:30 PM

Work Order: 1606036
Lab ID: 1606036-01
Matrix: SPLP EXTRACT

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U	H	0.34	1.2	µg/L	1	6/2/2016 22:58
Bis(2-chloroethyl)ether	U	H	0.43	1.2	µg/L	1	6/2/2016 22:58
Bis(2-chloroisopropyl)ether	U	H	0.27	1.2	µg/L	1	6/2/2016 22:58
Bis(2-ethylhexyl)phthalate	U	H	0.47	1.2	µg/L	1	6/2/2016 22:58
Butyl benzyl phthalate	U	H	0.35	1.2	µg/L	1	6/2/2016 22:58
Chrysene	U	H	0.049	0.12	µg/L	1	6/2/2016 22:58
Dibenzo(a,h)anthracene	U	H	0.086	0.12	µg/L	1	6/2/2016 22:58
Diethyl phthalate	U	H	0.20	1.2	µg/L	1	6/2/2016 22:58
Dimethyl phthalate	U	H	0.21	1.2	µg/L	1	6/2/2016 22:58
Di-n-butyl phthalate	**0.31**	JH	**0.24**	**1.2**	**µg/L**	1	6/2/2016 22:58
Di-n-octyl phthalate	U	H	0.17	1.2	µg/L	1	6/2/2016 22:58
Fluoranthene	**0.19**	H	**0.055**	**0.12**	**µg/L**	1	6/2/2016 22:58
Fluorene	U	H	0.042	0.12	µg/L	1	6/2/2016 22:58
Hexachlorobenzene	U	H	0.51	1.2	µg/L	1	6/2/2016 22:58
Hexachlorobutadiene	U	H	0.33	1.2	µg/L	1	6/2/2016 22:58
Hexachlorocyclopentadiene	U	H	1.3	5.8	µg/L	1	6/2/2016 22:58
Hexachloroethane	U	H	0.24	1.2	µg/L	1	6/2/2016 22:58
Indeno(1,2,3-cd)pyrene	U	H	0.074	0.12	µg/L	1	6/2/2016 22:58
Naphthalene	U	H	0.058	0.12	µg/L	1	6/2/2016 22:58
Nitrobenzene	U	H	0.30	1.2	µg/L	1	6/2/2016 22:58
N-Nitrosodimethylamine	U	H	0.56	1.2	µg/L	1	6/2/2016 22:58
N-Nitrosodi-n-propylamine	U	H	0.41	1.2	µg/L	1	6/2/2016 22:58
N-Nitrosodiphenylamine	U	H	0.27	1.2	µg/L	1	6/2/2016 22:58
Pentachlorophenol	U	H	1.1	5.8	µg/L	1	6/2/2016 22:58
Phenanthrene	U	H	0.063	0.12	µg/L	1	6/2/2016 22:58
Phenol	U	H	0.24	1.2	µg/L	1	6/2/2016 22:58
Pyrene	U	H	0.080	0.12	µg/L	1	6/2/2016 22:58
Surr: 2,4,6-Tribromophenol	*73.9*			*38-115*	*%REC*	1	6/2/2016 22:58
Surr: 2-Fluorobiphenyl	*68.7*			*32-100*	*%REC*	1	6/2/2016 22:58
Surr: 2-Fluorophenol	*57.5*			*22-59*	*%REC*	1	6/2/2016 22:58
Surr: 4-Terphenyl-d14	*92.0*			*23-112*	*%REC*	1	6/2/2016 22:58
Surr: Nitrobenzene-d5	*65.8*			*31-93*	*%REC*	1	6/2/2016 22:58
Surr: Phenol-d6	*40.9*	S		*13-36*	*%REC*	1	6/2/2016 22:58
VOLATILE ORGANIC COMPOUNDS - AQUEOUS		Method: **SW8260B**					Analyst: **BJB**
1,1,1-Trichloroethane	U	H	0.19	1.0	µg/L	1	6/3/2016 20:08
1,1,2,2-Tetrachloroethane	U	H	0.34	1.0	µg/L	1	6/3/2016 20:08
1,1,2-Trichloroethane	U	H	0.25	1.0	µg/L	1	6/3/2016 20:08
1,1-Dichloroethane	U	H	0.21	1.0	µg/L	1	6/3/2016 20:08
1,1-Dichloroethene	U	H	0.24	1.0	µg/L	1	6/3/2016 20:08

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-3
Collection Date: 5/16/2016 01:30 PM

Work Order: 1606036
Lab ID: 1606036-01
Matrix: SPLP EXTRACT

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,2-Dichlorobenzene	U	H	0.22	1.0	µg/L	1	6/3/2016 20:08
1,2-Dichloroethane	U	H	0.26	1.0	µg/L	1	6/3/2016 20:08
1,2-Dichloropropane	U	H	0.26	1.0	µg/L	1	6/3/2016 20:08
1,3-Dichlorobenzene	U	H	0.21	1.0	µg/L	1	6/3/2016 20:08
1,4-Dichlorobenzene	U	H	0.20	1.0	µg/L	1	6/3/2016 20:08
Acrolein	U	H	4.1	10	µg/L	1	6/3/2016 20:08
Acrylonitrile	U	H	0.38	1.0	µg/L	1	6/3/2016 20:08
Benzene	U	H	0.25	1.0	µg/L	1	6/3/2016 20:08
Bromodichloromethane	U	H	0.16	1.0	µg/L	1	6/3/2016 20:08
Bromoform	U	H	0.099	1.0	µg/L	1	6/3/2016 20:08
Bromomethane	U	H	1.0	1.0	µg/L	1	6/3/2016 20:08
Carbon tetrachloride	U	H	0.14	1.0	µg/L	1	6/3/2016 20:08
Chlorobenzene	U	H	0.19	1.0	µg/L	1	6/3/2016 20:08
Chloroethane	U	H	0.21	1.0	µg/L	1	6/3/2016 20:08
Chloroform	U	H	0.25	1.0	µg/L	1	6/3/2016 20:08
Chloromethane	U	H	0.25	1.0	µg/L	1	6/3/2016 20:08
cis-1,3-Dichloropropene	U	H	0.24	1.0	µg/L	1	6/3/2016 20:08
Dibromochloromethane	U	H	0.17	1.0	µg/L	1	6/3/2016 20:08
Methylene chloride	**1.5**	JH	**0.64**	**5.0**	**µg/L**	1	6/3/2016 20:08
Tetrachloroethene	U	H	0.25	1.0	µg/L	1	6/3/2016 20:08
Toluene	U	H	0.20	1.0	µg/L	1	6/3/2016 20:08
trans-1,2-Dichloroethene	U	H	0.29	1.0	µg/L	1	6/3/2016 20:08
trans-1,3-Dichloropropene	U	H	0.19	1.0	µg/L	1	6/3/2016 20:08
Trichloroethene	U	H	0.34	1.0	µg/L	1	6/3/2016 20:08
Vinyl chloride	U	H	0.19	1.0	µg/L	1	6/3/2016 20:08
Surr: 1,2-Dichloroethane-d4	*105*			*75-120*	*%REC*	1	6/3/2016 20:08
Surr: 4-Bromofluorobenzene	*96.0*			*80-110*	*%REC*	1	6/3/2016 20:08
Surr: Dibromofluoromethane	*93.4*			*85-115*	*%REC*	1	6/3/2016 20:08
Surr: Toluene-d8	*93.2*			*85-110*	*%REC*	1	6/3/2016 20:08
BIOCHEMICAL OXYGEN DEMAND		Method:	**A5210B-01**		Prep: A5210B / 6/2/16		Analyst: **KF**
Biochemical Oxygen Demand	U	H	2.0	2.0	mg/L	1	6/7/2016 09:55
CHLORIDE		Method:	**A4500-CL E-97**				Analyst: **ED**
Chloride	**1.3**		**0.11**	**1.0**	**mg/L**	1	6/2/2016 13:40
CYANIDE, TOTAL		Method:	**SW9012B**		Prep: SW9012B / 6/6/16		Analyst: **JB**
Cyanide, Total	U	H	0.0020	0.0050	mg/L	1	6/6/2016 13:38
CHEMICAL OXYGEN DEMAND		Method:	**E410.4 R2.0**				Analyst: **JJG**
Chemical Oxygen Demand	U		3.0	5.0	mg/L	1	6/6/2016 14:15

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:33/66:SB16-1162-3
Collection Date: 5/16/2016 01:30 PM

Work Order: 1606036
Lab ID: 1606036-01
Matrix: SPLP EXTRACT

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
NITROGEN, TOTAL		Method: **CALCULATION**					Analyst: **JJG**
Nitrogen, Total	U		**0**	**1.0**	**mg/L**	1	6/7/2016 18:02
AMMONIA AS NITROGEN		Method: **A4500-NH3 G-97**					Analyst: **JJG**
Ammonia as Nitrogen	U		0.0050	0.020	mg NH3-N/L	1	6/6/2016 10:39
NITROGEN, NITRITE		Method: **A4500-NO2 B**					Analyst: **LW**
Nitrogen, Nitrite	**0.0033**	JH	**0.0010**	**0.020**	**mg/L**	1	6/2/2016 12:50
NITROGEN, NITRATE		Method: **E353.2 R2.0**					Analyst: **JJG**
Nitrogen, Nitrate	**0.022**		**0.0090**	**0.020**	**mg/L**	1	6/3/2016 09:10
NITROGEN, NITRATE-NITRITE		Method: **E353.2 R2.0**			Prep: SW1312 / 6/2/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**0.026**	H	**0.013**	**0.020**	**mg/L**	1	6/3/2016 09:10
NITROGEN, TOTAL INORGANIC		Method: **CALCULATION**					Analyst: **JJG**
Nitrogen, Total Inorganic	**0.025**		**0**	**0.020**	**mg/L**	1	6/7/2016 18:02
NITROGEN, TOTAL ORGANIC		Method: **CALCULATION**					Analyst: **JJG**
Nitrogen, Total Organic	U		1.0	1.0	mg/L	1	6/7/2016 18:02
PHOSPHORUS, TOTAL		Method: **E365.1 R2.0**					Analyst: **JJG**
Phosphorus, Total	**0.044**	J	**0.024**	**0.050**	**mg/L**	1	6/4/2016 09:59
PH (LABORATORY)		Method: **SW9040C**					Analyst: **ED**
pH (laboratory)	**9.5**	H	**0**		**s.u.**	1	6/2/2016 12:15
PHOSPHORUS, ORTHO-P (AS P)		Method: **A4500-P E-99**					Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**0.041**	JH	**0.0080**	**0.050**	**mg/L**	1	6/2/2016 13:29
NITROGEN, TOTAL KJELDAHL		Method: **A4500-NH3 G-97**			Prep: A4500-N B / 6/2/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	U		0.48	1.0	mg/L	1	6/3/2016 09:18
ORGANIC CARBON, TOTAL		Method: **A5310C-00**					Analyst: **JJG**
Organic Carbon, Total	**2.2**		**0.039**	**0.50**	**mg/L**	1	6/2/2016 14:12

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-1
Collection Date: 5/16/2016 12:30 PM

Work Order: 1606036
Lab ID: 1606036-02
Matrix: SPLP EXTRACT

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3510 / 6/3/16		Analyst: **EB**
Aroclor 1016	U	H	0.054	0.22	µg/L	1	6/3/2016 22:36
Aroclor 1221	U	H	0.054	0.22	µg/L	1	6/3/2016 22:36
Aroclor 1232	U	H	0.054	0.22	µg/L	1	6/3/2016 22:36
Aroclor 1242	U	H	0.054	0.22	µg/L	1	6/3/2016 22:36
Aroclor 1248	U	H	0.054	0.22	µg/L	1	6/3/2016 22:36
Aroclor 1254	U	H	0.035	0.22	µg/L	1	6/3/2016 22:36
Aroclor 1260	U	H	0.035	0.22	µg/L	1	6/3/2016 22:36
Surr: Decachlorobiphenyl	*69.0*			*40-110*	*%REC*	1	6/3/2016 22:36
Surr: Tetrachloro-m-xylene	*63.0*			*40-110*	*%REC*	1	6/3/2016 22:36
PESTICIDES		Method: **SW8081A**			Prep: SW3510C / 6/3/16		Analyst: **BLM**
4,4´-DDD	U	H	0.0013	0.022	µg/L	1	6/4/2016 03:54
4,4´-DDE	U	H	0.0019	0.022	µg/L	1	6/4/2016 03:54
4,4´-DDT	U	H	0.0019	0.022	µg/L	1	6/4/2016 03:54
Aldrin	U	H	0.0031	0.011	µg/L	1	6/4/2016 03:54
alpha-BHC	U	H	0.0013	0.011	µg/L	1	6/4/2016 03:54
beta-BHC	U	H	0.0074	0.011	µg/L	1	6/4/2016 03:54
Chlordane, Technical	U	H	0.038	0.56	µg/L	1	6/4/2016 03:54
delta-BHC	U	H	0.0029	0.011	µg/L	1	6/4/2016 03:54
Dieldrin	U	H	0.0025	0.022	µg/L	1	6/4/2016 03:54
Endosulfan I	U	H	0.0019	0.022	µg/L	1	6/4/2016 03:54
Endosulfan II	U	H	0.0013	0.022	µg/L	1	6/4/2016 03:54
Endosulfan sulfate	U	H	0.0017	0.022	µg/L	1	6/4/2016 03:54
Endrin	U	H	0.0020	0.022	µg/L	1	6/4/2016 03:54
Endrin aldehyde	U	H	0.0031	0.022	µg/L	1	6/4/2016 03:54
gamma-BHC (Lindane)	U	H	0.0017	0.011	µg/L	1	6/4/2016 03:54
Heptachlor	U	H	0.0019	0.011	µg/L	1	6/4/2016 03:54
Heptachlor epoxide	U	H	0.0013	0.011	µg/L	1	6/4/2016 03:54
Toxaphene	U	H	0.12	2.2	µg/L	1	6/4/2016 03:54
Surr: Decachlorobiphenyl	*60.0*			*42-119*	*%REC*	1	6/4/2016 03:54
Surr: Tetrachloro-m-xylene	*54.0*			*32-104*	*%REC*	1	6/4/2016 03:54
MERCURY BY CVAA		Method: **SW7470A**			Prep: SW7470A / 6/6/16		Analyst: **LR**
Mercury	U		0.000019	0.00020	mg/L	1	6/6/2016 19:34
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3005A / 6/3/16		Analyst: **ML**
Magnesium	**7.8**		**0.0068**	**0.20**	**mg/L**	1	6/3/2016 23:33
Potassium	**0.85**		**0.017**	**0.20**	**mg/L**	1	6/3/2016 23:33
Sodium	**23**		**0.034**	**0.20**	**mg/L**	1	6/3/2016 23:33

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-1
Collection Date: 5/16/2016 12:30 PM

Work Order: 1606036
Lab ID: 1606036-02
Matrix: SPLP EXTRACT

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3005A / 6/3/16		Analyst: **ML**
Antimony	**0.00036**	J	**0.00017**	**0.0050**	**mg/L**	1	6/3/2016 23:33
Arsenic	**0.0022**	J	**0.00087**	**0.0050**	**mg/L**	1	6/3/2016 23:33
Beryllium	U		0.00012	0.0020	mg/L	1	6/3/2016 23:33
Cadmium	**0.000095**	J	**0.000050**	**0.0020**	**mg/L**	1	6/3/2016 23:33
Chromium	**0.0017**	J	**0.00065**	**0.0050**	**mg/L**	1	6/3/2016 23:33
Copper	**0.0011**	J	**0.00028**	**0.0050**	**mg/L**	1	6/3/2016 23:33
Lead	U		0.00033	0.0050	mg/L	1	6/3/2016 23:33
Nickel	**0.0012**	J	**0.00041**	**0.0050**	**mg/L**	1	6/3/2016 23:33
Selenium	U		0.00090	0.0050	mg/L	1	6/3/2016 23:33
Silver	U		0.000050	0.0050	mg/L	1	6/3/2016 23:33
Thallium	U		0.00016	0.0020	mg/L	1	6/3/2016 23:33
Zinc	**0.0051**	J	**0.0014**	**0.010**	**mg/L**	1	6/3/2016 23:33
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3510C / 6/3/16		Analyst: **JF**
1,2-Diphenylhydrazine	U	H	0.23	1.1	µg/L	1	6/3/2016 22:46
2,4,6-Trichlorophenol	U	H	0.26	1.1	µg/L	1	6/3/2016 22:46
2,4-Dichlorophenol	U	H	0.37	1.1	µg/L	1	6/3/2016 22:46
2,4-Dimethylphenol	U	H	0.38	1.1	µg/L	1	6/3/2016 22:46
2,4-Dinitrophenol	U	H	0.42	5.3	µg/L	1	6/3/2016 22:46
2,4-Dinitrotoluene	U	H	0.44	1.1	µg/L	1	6/3/2016 22:46
2,6-Dinitrotoluene	U	H	0.35	1.1	µg/L	1	6/3/2016 22:46
2-Chloronaphthalene	U	H	0.032	0.11	µg/L	1	6/3/2016 22:46
2-Chlorophenol	U	H	0.24	1.1	µg/L	1	6/3/2016 22:46
2-Nitrophenol	U	H	0.36	1.1	µg/L	1	6/3/2016 22:46
3,3´-Dichlorobenzidine	U	H	1.7	5.3	µg/L	1	6/3/2016 22:46
4,6-Dinitro-2-methylphenol	U	H	0.28	1.1	µg/L	1	6/3/2016 22:46
4-Bromophenyl phenyl ether	U	H	0.35	1.1	µg/L	1	6/3/2016 22:46
4-Chloro-3-methylphenol	U	H	0.27	1.1	µg/L	1	6/3/2016 22:46
4-Chlorophenyl phenyl ether	U	H	0.33	1.1	µg/L	1	6/3/2016 22:46
4-Nitrophenol	U	H	0.25	5.3	µg/L	1	6/3/2016 22:46
Acenaphthene	U	H	0.043	0.11	µg/L	1	6/3/2016 22:46
Acenaphthylene	U	H	0.041	0.11	µg/L	1	6/3/2016 22:46
Anthracene	U	H	0.029	0.11	µg/L	1	6/3/2016 22:46
Benzidine	U	H	2.1	5.3	µg/L	1	6/3/2016 22:46
Benzo(a)anthracene	U	H	0.076	0.11	µg/L	1	6/3/2016 22:46
Benzo(a)pyrene	U	H	0.038	0.11	µg/L	1	6/3/2016 22:46
Benzo(b)fluoranthene	U	H	0.045	0.11	µg/L	1	6/3/2016 22:46
Benzo(g,h,i)perylene	U	H	0.074	0.11	µg/L	1	6/3/2016 22:46
Benzo(k)fluoranthene	U	H	0.065	0.11	µg/L	1	6/3/2016 22:46

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-1
Collection Date: 5/16/2016 12:30 PM

Work Order: 1606036
Lab ID: 1606036-02
Matrix: SPLP EXTRACT

Analyses	Result	Qual		MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U	H		0.31	1.1	µg/L	1	6/3/2016 22:46
Bis(2-chloroethyl)ether	U	H		0.39	1.1	µg/L	1	6/3/2016 22:46
Bis(2-chloroisopropyl)ether	U	H		0.24	1.1	µg/L	1	6/3/2016 22:46
Bis(2-ethylhexyl)phthalate	U	H		0.42	1.1	µg/L	1	6/3/2016 22:46
Butyl benzyl phthalate	U	H		0.32	1.1	µg/L	1	6/3/2016 22:46
Chrysene	U	H		0.044	0.11	µg/L	1	6/3/2016 22:46
Dibenzo(a,h)anthracene	U	H		0.078	0.11	µg/L	1	6/3/2016 22:46
Diethyl phthalate	U	H		0.18	1.1	µg/L	1	6/3/2016 22:46
Dimethyl phthalate	U	H		0.19	1.1	µg/L	1	6/3/2016 22:46
Di-n-butyl phthalate	U	H		0.22	1.1	µg/L	1	6/3/2016 22:46
Di-n-octyl phthalate	U	H		0.16	1.1	µg/L	1	6/3/2016 22:46
Fluoranthene	U	H		0.049	0.11	µg/L	1	6/3/2016 22:46
Fluorene	U	H		0.038	0.11	µg/L	1	6/3/2016 22:46
Hexachlorobenzene	U	H		0.46	1.1	µg/L	1	6/3/2016 22:46
Hexachlorobutadiene	U	H		0.29	1.1	µg/L	1	6/3/2016 22:46
Hexachlorocyclopentadiene	U	H		1.1	5.3	µg/L	1	6/3/2016 22:46
Hexachloroethane	U	H		0.22	1.1	µg/L	1	6/3/2016 22:46
Indeno(1,2,3-cd)pyrene	U	H		0.067	0.11	µg/L	1	6/3/2016 22:46
Naphthalene	U	H		0.053	0.11	µg/L	1	6/3/2016 22:46
Nitrobenzene	U	H		0.27	1.1	µg/L	1	6/3/2016 22:46
N-Nitrosodimethylamine	U	H		0.51	1.1	µg/L	1	6/3/2016 22:46
N-Nitrosodi-n-propylamine	U	H		0.37	1.1	µg/L	1	6/3/2016 22:46
N-Nitrosodiphenylamine	U	H		0.24	1.1	µg/L	1	6/3/2016 22:46
Pentachlorophenol	U	H		1.0	5.3	µg/L	1	6/3/2016 22:46
Phenanthrene	U	H		0.057	0.11	µg/L	1	6/3/2016 22:46
Phenol	U	H		0.22	1.1	µg/L	1	6/3/2016 22:46
Pyrene	U	H		0.073	0.11	µg/L	1	6/3/2016 22:46
Surr: 2,4,6-Tribromophenol	*71.0*				*38-115*	*%REC*	1	6/3/2016 22:46
Surr: 2-Fluorobiphenyl	*74.0*				*32-100*	*%REC*	1	6/3/2016 22:46
Surr: 2-Fluorophenol	*46.3*				*22-59*	*%REC*	1	6/3/2016 22:46
Surr: 4-Terphenyl-d14	*81.3*				*23-112*	*%REC*	1	6/3/2016 22:46
Surr: Nitrobenzene-d5	*62.4*				*31-93*	*%REC*	1	6/3/2016 22:46
Surr: Phenol-d6	*27.8*				*13-36*	*%REC*	1	6/3/2016 22:46
VOLATILE ORGANIC COMPOUNDS - AQUEOUS			Method: **SW8260B**					Analyst: **BJB**
1,1,1-Trichloroethane	U	H		0.19	1.0	µg/L	1	6/3/2016 20:32
1,1,2,2-Tetrachloroethane	U	H		0.34	1.0	µg/L	1	6/3/2016 20:32
1,1,2-Trichloroethane	U	H		0.25	1.0	µg/L	1	6/3/2016 20:32
1,1-Dichloroethane	U	H		0.21	1.0	µg/L	1	6/3/2016 20:32
1,1-Dichloroethene	U	H		0.24	1.0	µg/L	1	6/3/2016 20:32

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-1
Collection Date: 5/16/2016 12:30 PM

Work Order: 1606036
Lab ID: 1606036-02
Matrix: SPLP EXTRACT

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,2-Dichlorobenzene	U	H	0.22	1.0	µg/L	1	6/3/2016 20:32
1,2-Dichloroethane	U	H	0.26	1.0	µg/L	1	6/3/2016 20:32
1,2-Dichloropropane	U	H	0.26	1.0	µg/L	1	6/3/2016 20:32
1,3-Dichlorobenzene	U	H	0.21	1.0	µg/L	1	6/3/2016 20:32
1,4-Dichlorobenzene	U	H	0.20	1.0	µg/L	1	6/3/2016 20:32
Acrolein	U	H	4.1	10	µg/L	1	6/3/2016 20:32
Acrylonitrile	U	H	0.38	1.0	µg/L	1	6/3/2016 20:32
Benzene	U	H	0.25	1.0	µg/L	1	6/3/2016 20:32
Bromodichloromethane	U	H	0.16	1.0	µg/L	1	6/3/2016 20:32
Bromoform	U	H	0.099	1.0	µg/L	1	6/3/2016 20:32
Bromomethane	U	H	1.0	1.0	µg/L	1	6/3/2016 20:32
Carbon tetrachloride	U	H	0.14	1.0	µg/L	1	6/3/2016 20:32
Chlorobenzene	U	H	0.19	1.0	µg/L	1	6/3/2016 20:32
Chloroethane	U	H	0.21	1.0	µg/L	1	6/3/2016 20:32
Chloroform	U	H	0.25	1.0	µg/L	1	6/3/2016 20:32
Chloromethane	U	H	0.25	1.0	µg/L	1	6/3/2016 20:32
cis-1,3-Dichloropropene	U	H	0.24	1.0	µg/L	1	6/3/2016 20:32
Dibromochloromethane	U	H	0.17	1.0	µg/L	1	6/3/2016 20:32
Methylene chloride	**1.2**	JH	**0.64**	**5.0**	**µg/L**	1	6/3/2016 20:32
Tetrachloroethene	U	H	0.25	1.0	µg/L	1	6/3/2016 20:32
Toluene	U	H	0.20	1.0	µg/L	1	6/3/2016 20:32
trans-1,2-Dichloroethene	U	H	0.29	1.0	µg/L	1	6/3/2016 20:32
trans-1,3-Dichloropropene	U	H	0.19	1.0	µg/L	1	6/3/2016 20:32
Trichloroethene	U	H	0.34	1.0	µg/L	1	6/3/2016 20:32
Vinyl chloride	U	H	0.19	1.0	µg/L	1	6/3/2016 20:32
Surr: 1,2-Dichloroethane-d4	*101*			*75-120*	*%REC*	1	6/3/2016 20:32
Surr: 4-Bromofluorobenzene	*96.0*			*80-110*	*%REC*	1	6/3/2016 20:32
Surr: Dibromofluoromethane	*91.8*			*85-115*	*%REC*	1	6/3/2016 20:32
Surr: Toluene-d8	*90.0*			*85-110*	*%REC*	1	6/3/2016 20:32
BIOCHEMICAL OXYGEN DEMAND		Method: **A5210B-01**			Prep: A5210B / 6/3/16		Analyst: **KF**
Biochemical Oxygen Demand	U	H	2.0	2.0	mg/L	1	6/8/2016 09:24
CHLORIDE		Method: **A4500-CL E-97**					Analyst: **ED**
Chloride	**0.89**	J	**0.11**	**1.0**	**mg/L**	1	6/6/2016 11:50
CYANIDE, TOTAL		Method: **SW9012B**			Prep: SW9012B / 6/6/16		Analyst: **JB**
Cyanide, Total	U	H	0.0020	0.0050	mg/L	1	6/6/2016 13:38
CHEMICAL OXYGEN DEMAND		Method: **E410.4 R2.0**					Analyst: **JJG**
Chemical Oxygen Demand	U		3.0	5.0	mg/L	1	6/6/2016 14:15

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:50/50:SB16-1160-1
Collection Date: 5/16/2016 12:30 PM

Work Order: 1606036
Lab ID: 1606036-02
Matrix: SPLP EXTRACT

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
NITROGEN, TOTAL		Method: **CALCULATION**					Analyst: **JJG**
Nitrogen, Total	U		**0**	**1.0**	**mg/L**	1	6/7/2016 18:02
AMMONIA AS NITROGEN		Method: **A4500-NH3 G-97**					Analyst: **JJG**
Ammonia as Nitrogen	U		0.0050	0.020	mg NH3-N/L	1	6/6/2016 10:39
NITROGEN, NITRITE		Method: **A4500-NO2 B**					Analyst: **LW**
Nitrogen, Nitrite	U	H	0.0010	0.020	mg/L	1	6/3/2016 22:45
NITROGEN, NITRATE		Method: **E353.2 R2.0**					Analyst: **JJG**
Nitrogen, Nitrate	**0.025**		**0.0090**	**0.020**	**mg/L**	1	6/7/2016 10:25
NITROGEN, NITRATE-NITRITE		Method: **E353.2 R2.0**			Prep: SW1312 / 6/3/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**0.018**	JH	**0.013**	**0.020**	**mg/L**	1	6/7/2016 10:25
NITROGEN, TOTAL INORGANIC		Method: **CALCULATION**					Analyst: **JJG**
Nitrogen, Total Inorganic	**0.025**		**0**	**0.020**	**mg/L**	1	6/7/2016 18:02
NITROGEN, TOTAL ORGANIC		Method: **CALCULATION**					Analyst: **JJG**
Nitrogen, Total Organic	U		1.0	1.0	mg/L	1	6/7/2016 18:02
PHOSPHORUS, TOTAL		Method: **E365.1 R2.0**					Analyst: **JJG**
Phosphorus, Total	U		0.024	0.050	mg/L	1	6/9/2016 13:39
PH (LABORATORY)		Method: **SW9040C**					Analyst: **ED**
pH (laboratory)	**9.4**	H	**0**		**s.u.**	1	6/3/2016 17:05
PHOSPHORUS, ORTHO-P (AS P)		Method: **A4500-P E-99**					Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**0.042**	JH	**0.0080**	**0.050**	**mg/L**	1	6/4/2016 11:54
NITROGEN, TOTAL KJELDAHL		Method: **A4500-NH3 G-97**			Prep: A4500-N B / 6/6/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	U		0.48	1.0	mg/L	1	6/7/2016 10:52
ORGANIC CARBON, TOTAL		Method: **A5310C-00**					Analyst: **JJG**
Organic Carbon, Total	**1.9**		**0.039**	**0.50**	**mg/L**	1	6/4/2016 12:32

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-3
Collection Date: 5/16/2016 01:00 PM

Work Order: 1606036
Lab ID: 1606036-03
Matrix: SPLP EXTRACT

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PCBS		Method: **SW8082**			Prep: SW3510 / 6/3/16		Analyst: **EB**
Aroclor 1016	U	H	0.048	0.20	µg/L	1	6/3/2016 22:53
Aroclor 1221	U	H	0.048	0.20	µg/L	1	6/3/2016 22:53
Aroclor 1232	U	H	0.048	0.20	µg/L	1	6/3/2016 22:53
Aroclor 1242	U	H	0.048	0.20	µg/L	1	6/3/2016 22:53
Aroclor 1248	U	H	0.048	0.20	µg/L	1	6/3/2016 22:53
Aroclor 1254	U	H	0.031	0.20	µg/L	1	6/3/2016 22:53
Aroclor 1260	U	H	0.031	0.20	µg/L	1	6/3/2016 22:53
Surr: Decachlorobiphenyl	*69.0*			*40-110*	*%REC*	1	6/3/2016 22:53
Surr: Tetrachloro-m-xylene	*70.0*			*40-110*	*%REC*	1	6/3/2016 22:53
PESTICIDES		Method: **SW8081A**			Prep: SW3510C / 6/3/16		Analyst: **BLM**
4,4´-DDD	U	H	0.0012	0.020	µg/L	1	6/4/2016 04:10
4,4´-DDE	U	H	0.0017	0.020	µg/L	1	6/4/2016 04:10
4,4´-DDT	U	H	0.0017	0.020	µg/L	1	6/4/2016 04:10
Aldrin	U	H	0.0028	0.010	µg/L	1	6/4/2016 04:10
alpha-BHC	U	H	0.0012	0.010	µg/L	1	6/4/2016 04:10
beta-BHC	U	H	0.0066	0.010	µg/L	1	6/4/2016 04:10
Chlordane, Technical	U	H	0.034	0.50	µg/L	1	6/4/2016 04:10
delta-BHC	U	H	0.0026	0.010	µg/L	1	6/4/2016 04:10
Dieldrin	U	H	0.0022	0.020	µg/L	1	6/4/2016 04:10
Endosulfan I	U	H	0.0017	0.020	µg/L	1	6/4/2016 04:10
Endosulfan II	U	H	0.0012	0.020	µg/L	1	6/4/2016 04:10
Endosulfan sulfate	U	H	0.0015	0.020	µg/L	1	6/4/2016 04:10
Endrin	U	H	0.0018	0.020	µg/L	1	6/4/2016 04:10
Endrin aldehyde	U	H	0.0028	0.020	µg/L	1	6/4/2016 04:10
gamma-BHC (Lindane)	U	H	0.0015	0.010	µg/L	1	6/4/2016 04:10
Heptachlor	U	H	0.0017	0.010	µg/L	1	6/4/2016 04:10
Heptachlor epoxide	U	H	0.0012	0.010	µg/L	1	6/4/2016 04:10
Toxaphene	U	H	0.11	2.0	µg/L	1	6/4/2016 04:10
Surr: Decachlorobiphenyl	*55.0*			*42-119*	*%REC*	1	6/4/2016 04:10
Surr: Tetrachloro-m-xylene	*63.0*			*32-104*	*%REC*	1	6/4/2016 04:10
MERCURY BY CVAA		Method: **SW7470A**			Prep: SW7470A / 6/6/16		Analyst: **LR**
Mercury	U		0.000019	0.00020	mg/L	1	6/6/2016 19:40
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3005A / 6/3/16		Analyst: **ML**
Magnesium	**6.4**		**0.0068**	**0.20**	**mg/L**	1	6/3/2016 23:39
Potassium	**0.95**		**0.017**	**0.20**	**mg/L**	1	6/3/2016 23:39
Sodium	**2.7**		**0.034**	**0.20**	**mg/L**	1	6/3/2016 23:39

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-3
Collection Date: 5/16/2016 01:00 PM

Work Order: 1606036
Lab ID: 1606036-03
Matrix: SPLP EXTRACT

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
METALS BY ICP-MS		Method: **SW6020A**			Prep: SW3005A / 6/3/16		Analyst: **ML**
Antimony	**0.00038**	J	**0.00017**	**0.0050**	**mg/L**	1	6/3/2016 23:39
Arsenic	**0.0013**	J	**0.00087**	**0.0050**	**mg/L**	1	6/3/2016 23:39
Beryllium	U		0.00012	0.0020	mg/L	1	6/3/2016 23:39
Cadmium	**0.000098**	J	**0.000050**	**0.0020**	**mg/L**	1	6/3/2016 23:39
Chromium	**0.00078**	J	**0.00065**	**0.0050**	**mg/L**	1	6/3/2016 23:39
Copper	**0.0011**	J	**0.00028**	**0.0050**	**mg/L**	1	6/3/2016 23:39
Lead	U		0.00033	0.0050	mg/L	1	6/3/2016 23:39
Nickel	**0.00059**	J	**0.00041**	**0.0050**	**mg/L**	1	6/3/2016 23:39
Selenium	**0.0015**	J	**0.00090**	**0.0050**	**mg/L**	1	6/3/2016 23:39
Silver	U		0.000050	0.0050	mg/L	1	6/3/2016 23:39
Thallium	U		0.00016	0.0020	mg/L	1	6/3/2016 23:39
Zinc	U		0.0014	0.010	mg/L	1	6/3/2016 23:39
SEMI-VOLATILE ORGANIC COMPOUNDS		Method: **SW8270C**			Prep: SW3510C / 6/3/16		Analyst: **JF**
1,2-Diphenylhydrazine	U	H	0.23	1.1	µg/L	1	6/3/2016 23:10
2,4,6-Trichlorophenol	U	H	0.26	1.1	µg/L	1	6/3/2016 23:10
2,4-Dichlorophenol	U	H	0.37	1.1	µg/L	1	6/3/2016 23:10
2,4-Dimethylphenol	U	H	0.38	1.1	µg/L	1	6/3/2016 23:10
2,4-Dinitrophenol	U	H	0.42	5.3	µg/L	1	6/3/2016 23:10
2,4-Dinitrotoluene	U	H	0.44	1.1	µg/L	1	6/3/2016 23:10
2,6-Dinitrotoluene	U	H	0.35	1.1	µg/L	1	6/3/2016 23:10
2-Chloronaphthalene	U	H	0.032	0.11	µg/L	1	6/3/2016 23:10
2-Chlorophenol	U	H	0.24	1.1	µg/L	1	6/3/2016 23:10
2-Nitrophenol	**0.88**	JH	**0.36**	**1.1**	**µg/L**	1	6/3/2016 23:10
3,3´-Dichlorobenzidine	U	H	1.7	5.3	µg/L	1	6/3/2016 23:10
4,6-Dinitro-2-methylphenol	U	H	0.28	1.1	µg/L	1	6/3/2016 23:10
4-Bromophenyl phenyl ether	U	H	0.35	1.1	µg/L	1	6/3/2016 23:10
4-Chloro-3-methylphenol	U	H	0.27	1.1	µg/L	1	6/3/2016 23:10
4-Chlorophenyl phenyl ether	U	H	0.33	1.1	µg/L	1	6/3/2016 23:10
4-Nitrophenol	U	H	0.25	5.3	µg/L	1	6/3/2016 23:10
Acenaphthene	U	H	0.043	0.11	µg/L	1	6/3/2016 23:10
Acenaphthylene	U	H	0.041	0.11	µg/L	1	6/3/2016 23:10
Anthracene	U	H	0.030	0.11	µg/L	1	6/3/2016 23:10
Benzidine	U	H	2.1	5.3	µg/L	1	6/3/2016 23:10
Benzo(a)anthracene	U	H	0.076	0.11	µg/L	1	6/3/2016 23:10
Benzo(a)pyrene	U	H	0.038	0.11	µg/L	1	6/3/2016 23:10
Benzo(b)fluoranthene	U	H	0.045	0.11	µg/L	1	6/3/2016 23:10
Benzo(g,h,i)perylene	U	H	0.074	0.11	µg/L	1	6/3/2016 23:10
Benzo(k)fluoranthene	U	H	0.065	0.11	µg/L	1	6/3/2016 23:10

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-3
Collection Date: 5/16/2016 01:00 PM

Work Order: 1606036
Lab ID: 1606036-03
Matrix: SPLP EXTRACT

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
Bis(2-chloroethoxy)methane	U	H	0.31	1.1	µg/L	1	6/3/2016 23:10
Bis(2-chloroethyl)ether	U	H	0.39	1.1	µg/L	1	6/3/2016 23:10
Bis(2-chloroisopropyl)ether	U	H	0.24	1.1	µg/L	1	6/3/2016 23:10
Bis(2-ethylhexyl)phthalate	U	H	0.42	1.1	µg/L	1	6/3/2016 23:10
Butyl benzyl phthalate	U	H	0.32	1.1	µg/L	1	6/3/2016 23:10
Chrysene	U	H	0.044	0.11	µg/L	1	6/3/2016 23:10
Dibenzo(a,h)anthracene	U	H	0.078	0.11	µg/L	1	6/3/2016 23:10
Diethyl phthalate	U	H	0.18	1.1	µg/L	1	6/3/2016 23:10
Dimethyl phthalate	U	H	0.19	1.1	µg/L	1	6/3/2016 23:10
Di-n-butyl phthalate	**0.31**	JH	**0.22**	**1.1**	**µg/L**	1	6/3/2016 23:10
Di-n-octyl phthalate	U	H	0.16	1.1	µg/L	1	6/3/2016 23:10
Fluoranthene	U	H	0.050	0.11	µg/L	1	6/3/2016 23:10
Fluorene	U	H	0.038	0.11	µg/L	1	6/3/2016 23:10
Hexachlorobenzene	U	H	0.46	1.1	µg/L	1	6/3/2016 23:10
Hexachlorobutadiene	U	H	0.30	1.1	µg/L	1	6/3/2016 23:10
Hexachlorocyclopentadiene	U	H	1.1	5.3	µg/L	1	6/3/2016 23:10
Hexachloroethane	U	H	0.22	1.1	µg/L	1	6/3/2016 23:10
Indeno(1,2,3-cd)pyrene	U	H	0.068	0.11	µg/L	1	6/3/2016 23:10
Naphthalene	U	H	0.053	0.11	µg/L	1	6/3/2016 23:10
Nitrobenzene	U	H	0.27	1.1	µg/L	1	6/3/2016 23:10
N-Nitrosodimethylamine	U	H	0.51	1.1	µg/L	1	6/3/2016 23:10
N-Nitrosodi-n-propylamine	U	H	0.37	1.1	µg/L	1	6/3/2016 23:10
N-Nitrosodiphenylamine	U	H	0.24	1.1	µg/L	1	6/3/2016 23:10
Pentachlorophenol	U	H	1.0	5.3	µg/L	1	6/3/2016 23:10
Phenanthrene	U	H	0.057	0.11	µg/L	1	6/3/2016 23:10
Phenol	U	H	0.22	1.1	µg/L	1	6/3/2016 23:10
Pyrene	U	H	0.073	0.11	µg/L	1	6/3/2016 23:10
Surr: 2,4,6-Tribromophenol	*74.0*			*38-115*	*%REC*	1	6/3/2016 23:10
Surr: 2-Fluorobiphenyl	*77.1*			*32-100*	*%REC*	1	6/3/2016 23:10
Surr: 2-Fluorophenol	*44.3*			*22-59*	*%REC*	1	6/3/2016 23:10
Surr: 4-Terphenyl-d14	*90.2*			*23-112*	*%REC*	1	6/3/2016 23:10
Surr: Nitrobenzene-d5	*62.4*			*31-93*	*%REC*	1	6/3/2016 23:10
Surr: Phenol-d6	*26.6*			*13-36*	*%REC*	1	6/3/2016 23:10
VOLATILE ORGANIC COMPOUNDS - AQUEOUS		Method: **SW8260B**					Analyst: **BJB**
1,1,1-Trichloroethane	U	H	0.19	1.0	µg/L	1	6/3/2016 20:57
1,1,2,2-Tetrachloroethane	U	H	0.34	1.0	µg/L	1	6/3/2016 20:57
1,1,2-Trichloroethane	U	H	0.25	1.0	µg/L	1	6/3/2016 20:57
1,1-Dichloroethane	U	H	0.21	1.0	µg/L	1	6/3/2016 20:57
1,1-Dichloroethene	U	H	0.24	1.0	µg/L	1	6/3/2016 20:57

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-3
Collection Date: 5/16/2016 01:00 PM

Work Order: 1606036
Lab ID: 1606036-03
Matrix: SPLP EXTRACT

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
1,2-Dichlorobenzene	U	H	0.22	1.0	µg/L	1	6/3/2016 20:57
1,2-Dichloroethane	U	H	0.26	1.0	µg/L	1	6/3/2016 20:57
1,2-Dichloropropane	U	H	0.26	1.0	µg/L	1	6/3/2016 20:57
1,3-Dichlorobenzene	U	H	0.21	1.0	µg/L	1	6/3/2016 20:57
1,4-Dichlorobenzene	U	H	0.20	1.0	µg/L	1	6/3/2016 20:57
Acrolein	U	H	4.1	10	µg/L	1	6/3/2016 20:57
Acrylonitrile	U	H	0.38	1.0	µg/L	1	6/3/2016 20:57
Benzene	U	H	0.25	1.0	µg/L	1	6/3/2016 20:57
Bromodichloromethane	U	H	0.16	1.0	µg/L	1	6/3/2016 20:57
Bromoform	U	H	0.099	1.0	µg/L	1	6/3/2016 20:57
Bromomethane	U	H	1.0	1.0	µg/L	1	6/3/2016 20:57
Carbon tetrachloride	U	H	0.14	1.0	µg/L	1	6/3/2016 20:57
Chlorobenzene	U	H	0.19	1.0	µg/L	1	6/3/2016 20:57
Chloroethane	U	H	0.21	1.0	µg/L	1	6/3/2016 20:57
Chloroform	U	H	0.25	1.0	µg/L	1	6/3/2016 20:57
Chloromethane	U	H	0.25	1.0	µg/L	1	6/3/2016 20:57
cis-1,3-Dichloropropene	U	H	0.24	1.0	µg/L	1	6/3/2016 20:57
Dibromochloromethane	U	H	0.17	1.0	µg/L	1	6/3/2016 20:57
Methylene chloride	**1.1**	JH	**0.64**	**5.0**	**µg/L**	1	6/3/2016 20:57
Tetrachloroethene	U	H	0.25	1.0	µg/L	1	6/3/2016 20:57
Toluene	U	H	0.20	1.0	µg/L	1	6/3/2016 20:57
trans-1,2-Dichloroethene	U	H	0.29	1.0	µg/L	1	6/3/2016 20:57
trans-1,3-Dichloropropene	U	H	0.19	1.0	µg/L	1	6/3/2016 20:57
Trichloroethene	U	H	0.34	1.0	µg/L	1	6/3/2016 20:57
Vinyl chloride	U	H	0.19	1.0	µg/L	1	6/3/2016 20:57
Surr: 1,2-Dichloroethane-d4	*103*			*75-120*	*%REC*	1	6/3/2016 20:57
Surr: 4-Bromofluorobenzene	*96.6*			*80-110*	*%REC*	1	6/3/2016 20:57
Surr: Dibromofluoromethane	*92.3*			*85-115*	*%REC*	1	6/3/2016 20:57
Surr: Toluene-d8	*90.0*			*85-110*	*%REC*	1	6/3/2016 20:57
BIOCHEMICAL OXYGEN DEMAND		Method:	**A5210B-01**		Prep: A5210B / 6/3/16		Analyst: **KF**
Biochemical Oxygen Demand	U	H	2.0	2.0	mg/L	1	6/8/2016 09:24
CHLORIDE		Method:	**A4500-CL E-97**				Analyst: **ED**
Chloride	**1.6**		**0.11**	**1.0**	**mg/L**	1	6/6/2016 11:50
CYANIDE, TOTAL		Method:	**SW9012B**		Prep: SW9012B / 6/6/16		Analyst: **JB**
Cyanide, Total	U	H	0.0020	0.0050	mg/L	1	6/6/2016 13:38
CHEMICAL OXYGEN DEMAND		Method:	**E410.4 R2.0**				Analyst: **JJG**
Chemical Oxygen Demand	U		3.0	5.0	mg/L	1	6/6/2016 14:15

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: *10-Jun-16*

Client: Hull & Associates, Inc.
Project: RCK001
Sample ID: RCK001:66/33:SB16-1161-3
Collection Date: 5/16/2016 01:00 PM

Work Order: 1606036
Lab ID: 1606036-03
Matrix: SPLP EXTRACT

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
NITROGEN, TOTAL		Method: **CALCULATION**					Analyst: **JJG**
Nitrogen, Total	U		**0**	**1.0**	**mg/L**	1	6/7/2016 18:02
AMMONIA AS NITROGEN		Method: **A4500-NH3 G-97**					Analyst: **JJG**
Ammonia as Nitrogen	U		0.0050	0.020	mg NH3-N/L	1	6/6/2016 10:39
NITROGEN, NITRITE		Method: **A4500-NO2 B**					Analyst: **LW**
Nitrogen, Nitrite	U	H	0.0010	0.020	mg/L	1	6/3/2016 22:45
NITROGEN, NITRATE		Method: **E353.2 R2.0**					Analyst: **JJG**
Nitrogen, Nitrate	**0.061**		**0.0090**	**0.020**	**mg/L**	1	6/7/2016 10:25
NITROGEN, NITRATE-NITRITE		Method: **E353.2 R2.0**			Prep: SW1312 / 6/3/16		Analyst: **JJG**
Nitrogen, Nitrate-Nitrite	**0.062**	H	**0.013**	**0.020**	**mg/L**	1	6/7/2016 10:25
NITROGEN, TOTAL INORGANIC		Method: **CALCULATION**					Analyst: **JJG**
Nitrogen, Total Inorganic	**0.061**		**0**	**0.020**	**mg/L**	1	6/7/2016 18:02
NITROGEN, TOTAL ORGANIC		Method: **CALCULATION**					Analyst: **JJG**
Nitrogen, Total Organic	U		1.0	1.0	mg/L	1	6/7/2016 18:02
PHOSPHORUS, TOTAL		Method: **E365.1 R2.0**					Analyst: **JJG**
Phosphorus, Total	U		0.024	0.050	mg/L	1	6/9/2016 13:39
PH (LABORATORY)		Method: **SW9040C**					Analyst: **ED**
pH (laboratory)	**9.3**	H	**0**		**s.u.**	1	6/3/2016 17:05
PHOSPHORUS, ORTHO-P (AS P)		Method: **A4500-P E-99**					Analyst: **JJG**
Phosphorus, Ortho-P (As P)	**0.083**	H	**0.0080**	**0.050**	**mg/L**	1	6/4/2016 11:54
NITROGEN, TOTAL KJELDAHL		Method: **A4500-NH3 G-97**			Prep: A4500-N B / 6/6/16		Analyst: **JB**
Nitrogen, Total Kjeldahl	U		0.48	1.0	mg/L	1	6/7/2016 10:52
ORGANIC CARBON, TOTAL		Method: **A5310C-00**					Analyst: **JJG**
Organic Carbon, Total	**1.7**		**0.039**	**0.50**	**mg/L**	1	6/4/2016 12:32

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 10-Jun-16

Client: Hull & Associates, Inc.

Work Order: 1606036

Project: RCK001

QC BATCH REPORT

Batch ID: **86802** Instrument ID **GC14** Method: **SW8082**

MBLK	Sample ID: **PBLKW1-86802-86802**			Units: **µg/L**			Analysis Date: **6/3/2016 07:58 PM**			
Client ID:	Run ID: **GC14_160603A**			SeqNo: **3861196**		Prep Date: **6/2/2016**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	U	0.20								
Aroclor 1221	U	0.20								
Aroclor 1232	U	0.20								
Aroclor 1242	U	0.20								
Aroclor 1248	U	0.20								
Aroclor 1254	U	0.20								
Aroclor 1260	U	0.20								
Surr: Decachlorobiphenyl	*0.069*	0	*0.1*	0	*69*	*40-110*	0			
Surr: Tetrachloro-m-xylene	*0.059*	0	*0.1*	0	*59*	*40-110*	0			

LCS	Sample ID: **PLCSW1-86802-86802**			Units: **µg/L**			Analysis Date: **6/3/2016 08:15 PM**			
Client ID:	Run ID: **GC14_160603A**			SeqNo: **3861197**		Prep Date: **6/2/2016**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	1.744	0.20	2.5	0	69.8	50-130	0			
Aroclor 1260	2.03	0.20	2.5	0	81.2	50-130	0			
Surr: Decachlorobiphenyl	*0.072*	0	*0.1*	0	*72*	*40-110*	0			
Surr: Tetrachloro-m-xylene	*0.058*	0	*0.1*	0	*58*	*40-110*	0			

LCSD	Sample ID: **PLCSDW1-86802-86802**			Units: **µg/L**			Analysis Date: **6/3/2016 08:33 PM**			
Client ID:	Run ID: **GC14_160603A**			SeqNo: **3861198**		Prep Date: **6/2/2016**		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	1.761	0.20	2.5	0	70.4	50-130	1.744	0.97	30	
Aroclor 1260	1.904	0.20	2.5	0	76.2	50-130	2.03	6.41	30	
Surr: Decachlorobiphenyl	*0.071*	0	*0.1*	0	*71*	*40-110*	0.072	*1.4*		
Surr: Tetrachloro-m-xylene	*0.059*	0	*0.1*	0	*59*	*40-110*	0.058	*1.71*		

The following samples were analyzed in this batch: 1606036-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **86803** Instrument ID **GC12** Method: **SW8081A**

MBLK Sample ID: **PBLKW1-86803-86803** Units: **µg/L** Analysis Date: **6/4/2016 02:03 AM**
Client ID: Run ID: **GC12_160603B** SeqNo: **3861021** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	U	0.020								
4,4´-DDE	U	0.020								
4,4´-DDT	U	0.020								
Aldrin	U	0.010								
alpha-BHC	U	0.010								
beta-BHC	U	0.010								
Chlordane, Technical	U	0.50								
delta-BHC	U	0.010								
Dieldrin	U	0.020								
Endosulfan I	U	0.020								
Endosulfan II	U	0.020								
Endosulfan sulfate	U	0.020								
Endrin	U	0.020								
Endrin aldehyde	U	0.020								
gamma-BHC (Lindane)	U	0.010								
Heptachlor	U	0.010								
Heptachlor epoxide	U	0.010								
Toxaphene	U	2.0								
Surr: Decachlorobiphenyl	*0.061*	0	*0.1*	0	*61*	*42-119*	0			
Surr: Tetrachloro-m-xylene	*0.055*	0	*0.1*	0	*55*	*32-104*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86803** Instrument ID **GC12** Method: **SW8081A**

LCS Sample ID: **PLCSW1-86803-86803** Units: **µg/L** Analysis Date: **6/4/2016 02:19 AM**
Client ID: Run ID: **GC12_160603B** SeqNo: **3861022** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	0.058	0.020	0.1	0	58	33-126	0			
4,4´-DDE	0.056	0.020	0.1	0	56	34-112	0			
4,4´-DDT	0.066	0.020	0.1	0	66	41-122	0			
Aldrin	0.043	0.010	0.1	0	43	25-150	0			
alpha-BHC	0.054	0.010	0.1	0	54	31-109	0			
beta-BHC	0.058	0.010	0.1	0	58	38-108	0			
delta-BHC	0.059	0.010	0.1	0	59	36-114	0			
Dieldrin	0.059	0.020	0.1	0	59	35-114	0			
Endosulfan I	0.059	0.020	0.1	0	59	32-114	0			
Endosulfan II	0.062	0.020	0.1	0	62	40-119	0			
Endosulfan sulfate	0.064	0.020	0.1	0	64	42-120	0			
Endrin	0.055	0.020	0.1	0	55	39-123	0			
Endrin aldehyde	0.061	0.020	0.1	0	61	29-116	0			
gamma-BHC (Lindane)	0.056	0.010	0.1	0	56	32-114	0			
Heptachlor	0.056	0.010	0.1	0	56	34-112	0			
Heptachlor epoxide	0.058	0.010	0.1	0	58	36-109	0			
Surr: Decachlorobiphenyl	*0.061*	0	*0.1*	0	*61*	*42-119*	0			
Surr: Tetrachloro-m-xylene	*0.057*	0	*0.1*	0	*57*	*32-104*	0			

LCSD Sample ID: **PLCSDW1-86803-86803** Units: **µg/L** Analysis Date: **6/4/2016 02:35 AM**
Client ID: Run ID: **GC12_160603B** SeqNo: **3861023** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	0.057	0.020	0.1	0	57	33-126	0.058	1.74	30	
4,4´-DDE	0.053	0.020	0.1	0	53	34-112	0.056	5.5	30	
4,4´-DDT	0.063	0.020	0.1	0	63	41-122	0.066	4.65	30	
Aldrin	0.037	0.010	0.1	0	37	25-150	0.043	15	30	
alpha-BHC	0.052	0.010	0.1	0	52	31-109	0.054	3.77	30	
beta-BHC	0.055	0.010	0.1	0	55	38-108	0.058	5.31	30	
delta-BHC	0.057	0.010	0.1	0	57	36-114	0.059	3.45	30	
Dieldrin	0.056	0.020	0.1	0	56	35-114	0.059	5.22	30	
Endosulfan I	0.055	0.020	0.1	0	55	32-114	0.059	7.02	30	
Endosulfan II	0.058	0.020	0.1	0	58	40-119	0.062	6.67	30	
Endosulfan sulfate	0.062	0.020	0.1	0	62	42-120	0.064	3.17	30	
Endrin	0.046	0.020	0.1	0	46	39-123	0.055	17.8	30	
Endrin aldehyde	0.06	0.020	0.1	0	60	29-116	0.061	1.65	30	
gamma-BHC (Lindane)	0.053	0.010	0.1	0	53	32-114	0.056	5.5	30	
Heptachlor	0.052	0.010	0.1	0	52	34-112	0.056	7.41	30	
Heptachlor epoxide	0.055	0.010	0.1	0	55	36-109	0.058	5.31	30	
Surr: Decachlorobiphenyl	*0.059*	0	*0.1*	0	*59*	*42-119*	0.061	*3.33*	*30*	
Surr: Tetrachloro-m-xylene	*0.056*	0	*0.1*	0	*56*	*32-104*	0.057	*1.77*	*30*	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86803** Instrument ID **GC12** Method: **SW8081A**

The following samples were analyzed in this batch: 1606036-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86860** Instrument ID **GC14** Method: **SW8082**

MBLK Sample ID: **PBLKW1-86860-86860** Units: **µg/L** Analysis Date: **6/3/2016 07:05 PM**
Client ID: Run ID: **GC14_160603A** SeqNo: **3861190** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	U	0.20								
Aroclor 1221	U	0.20								
Aroclor 1232	U	0.20								
Aroclor 1242	U	0.20								
Aroclor 1248	U	0.20								
Aroclor 1254	U	0.20								
Aroclor 1260	U	0.20								
Surr: Decachlorobiphenyl	*0.069*	0	*0.1*	0	*69*	*40-110*	0			
Surr: Tetrachloro-m-xylene	*0.047*	0	*0.1*	0	*47*	*40-110*	0			

LCS Sample ID: **PLCSW1-86860-86860** Units: **µg/L** Analysis Date: **6/3/2016 07:22 PM**
Client ID: Run ID: **GC14_160603A** SeqNo: **3861191** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	1.616	0.20	2.5	0	64.6	50-130	0			
Aroclor 1260	1.867	0.20	2.5	0	74.7	50-130	0			
Surr: Decachlorobiphenyl	*0.077*	0	*0.1*	0	*77*	*40-110*	0			
Surr: Tetrachloro-m-xylene	*0.051*	0	*0.1*	0	*51*	*40-110*	0			

LCSD Sample ID: **PLCSDW1-86860-86860** Units: **µg/L** Analysis Date: **6/3/2016 07:40 PM**
Client ID: Run ID: **GC14_160603A** SeqNo: **3861192** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	1.617	0.20	2.5	0	64.7	50-130	1.616	0.0619	30	
Aroclor 1260	1.76	0.20	2.5	0	70.4	50-130	1.867	5.9	30	
Surr: Decachlorobiphenyl	*0.07*	0	*0.1*	0	*70*	*40-110*	0.077	*9.52*		
Surr: Tetrachloro-m-xylene	*0.046*	0	*0.1*	0	*46*	*40-110*	0.051	*10.3*		

The following samples were analyzed in this batch: 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **86862** Instrument ID **GC12** Method: **SW8081A**

MBLK Sample ID: **PBLKW1-86862-86862** Units: **µg/L** Analysis Date: **6/4/2016 02:50 AM**
Client ID: Run ID: **GC12_160603B** SeqNo: **3861024** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	U	0.020								
4,4´-DDE	U	0.020								
4,4´-DDT	U	0.020								
Aldrin	U	0.010								
alpha-BHC	U	0.010								
beta-BHC	U	0.010								
Chlordane, Technical	U	0.50								
delta-BHC	U	0.010								
Dieldrin	U	0.020								
Endosulfan I	U	0.020								
Endosulfan II	U	0.020								
Endosulfan sulfate	U	0.020								
Endrin	U	0.020								
Endrin aldehyde	U	0.020								
gamma-BHC (Lindane)	U	0.010								
Heptachlor	U	0.010								
Heptachlor epoxide	U	0.010								
Toxaphene	U	2.0								
Surr: Decachlorobiphenyl	*0.06*	0	*0.1*	0	*60*	*42-119*		0		
Surr: Tetrachloro-m-xylene	*0.043*	0	*0.1*	0	*43*	*32-104*		0		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86862** Instrument ID **GC12** Method: **SW8081A**

LCS Sample ID: **PLCSW1-86862-86862** Units: **µg/L** Analysis Date: **6/4/2016 03:06 AM**
Client ID: Run ID: **GC12_160603B** SeqNo: **3861025** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	0.06	0.020	0.1	0	60	33-126	0			
4,4´-DDE	0.051	0.020	0.1	0	51	34-112	0			
4,4´-DDT	0.057	0.020	0.1	0	57	41-122	0			
Aldrin	0.018	0.010	0.1	0	18	25-150	0			S
alpha-BHC	0.047	0.010	0.1	0	47	31-109	0			
beta-BHC	0.052	0.010	0.1	0	52	38-108	0			
delta-BHC	0.057	0.010	0.1	0	57	36-114	0			
Dieldrin	0.054	0.020	0.1	0	54	35-114	0			
Endosulfan I	0.053	0.020	0.1	0	53	32-114	0			
Endosulfan II	0.057	0.020	0.1	0	57	40-119	0			
Endosulfan sulfate	0.062	0.020	0.1	0	62	42-120	0			
Endrin	0.052	0.020	0.1	0	52	39-123	0			
Endrin aldehyde	0.059	0.020	0.1	0	59	29-116	0			
gamma-BHC (Lindane)	0.049	0.010	0.1	0	49	32-114	0			
Heptachlor	0.038	0.010	0.1	0	38	34-112	0			
Heptachlor epoxide	0.052	0.010	0.1	0	52	36-109	0			
Surr: Decachlorobiphenyl	*0.059*	0	*0.1*	0	*59*	*42-119*	0			
Surr: Tetrachloro-m-xylene	*0.046*	0	*0.1*	0	*46*	*32-104*	0			

LCSD Sample ID: **PLCSDW1-86862-86862** Units: **µg/L** Analysis Date: **6/4/2016 03:22 AM**
Client ID: Run ID: **GC12_160603B** SeqNo: **3861026** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
4,4´-DDD	0.055	0.020	0.1	0	55	33-126	0.06	8.7	30	
4,4´-DDE	0.048	0.020	0.1	0	48	34-112	0.051	6.06	30	
4,4´-DDT	0.056	0.020	0.1	0	56	41-122	0.057	1.77	30	
Aldrin	0.022	0.010	0.1	0	22	25-150	0.018	20	30	S
alpha-BHC	0.045	0.010	0.1	0	45	31-109	0.047	4.35	30	
beta-BHC	0.046	0.010	0.1	0	46	38-108	0.052	12.2	30	
delta-BHC	0.053	0.010	0.1	0	53	36-114	0.057	7.27	30	
Dieldrin	0.049	0.020	0.1	0	49	35-114	0.054	9.71	30	
Endosulfan I	0.048	0.020	0.1	0	48	32-114	0.053	9.9	30	
Endosulfan II	0.053	0.020	0.1	0	53	40-119	0.057	7.27	30	
Endosulfan sulfate	0.058	0.020	0.1	0	58	42-120	0.062	6.67	30	
Endrin	0.048	0.020	0.1	0	48	39-123	0.052	8	30	
Endrin aldehyde	0.059	0.020	0.1	0	59	29-116	0.059	0	30	
gamma-BHC (Lindane)	0.045	0.010	0.1	0	45	32-114	0.049	8.51	30	
Heptachlor	0.04	0.010	0.1	0	40	34-112	0.038	5.13	30	
Heptachlor epoxide	0.047	0.010	0.1	0	47	36-109	0.052	10.1	30	
Surr: Decachlorobiphenyl	*0.057*	0	*0.1*	0	*57*	*42-119*	0.059	*3.45*	*30*	
Surr: Tetrachloro-m-xylene	*0.043*	0	*0.1*	0	*43*	*32-104*	0.046	*6.74*	*30*	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86862** Instrument ID **GC12** Method: **SW8081A**

The following samples were analyzed in this batch: 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86812** Instrument ID **HG1** Method: **SW7470A**

MBLK Sample ID: **MBLK-86812-86812** Units: **mg/L** Analysis Date: **6/2/2016 04:17 PM**
Client ID: Run ID: **HG1_160602A** SeqNo: **3858241** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.00020								

LCS Sample ID: **LCS-86812-86812** Units: **mg/L** Analysis Date: **6/2/2016 04:19 PM**
Client ID: Run ID: **HG1_160602A** SeqNo: **3858242** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00204	0.00020	0.002	0	102	80-120	0			

MS Sample ID: **1606036-01AMS** Units: **mg/L** Analysis Date: **6/2/2016 04:24 PM**
Client ID: **RCK001:33/66:SB16-1162-3** Run ID: **HG1_160602A** SeqNo: **3858244** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.0021	0.00020	0.002	-0.000054	108	75-125	0			

MSD Sample ID: **1606036-01AMSD** Units: **mg/L** Analysis Date: **6/2/2016 04:26 PM**
Client ID: **RCK001:33/66:SB16-1162-3** Run ID: **HG1_160602A** SeqNo: **3858245** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00211	0.00020	0.002	-0.000054	108	75-125	0.0021	0.475	20	

The following samples were analyzed in this batch: 1606036-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86984** Instrument ID **HG1** Method: **SW7470A**

MBLK Sample ID: **MBLK-86984-86984** Units: **mg/L** Analysis Date: **6/6/2016 07:29 PM**
Client ID: Run ID: **HG1_160606A** SeqNo: **3862415** Prep Date: **6/6/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	U	0.00020								

LCS Sample ID: **LCS-86984-86984** Units: **mg/L** Analysis Date: **6/6/2016 07:31 PM**
Client ID: Run ID: **HG1_160606A** SeqNo: **3862416** Prep Date: **6/6/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00201	0.00020	0.002	0	100	80-120	0			

MS Sample ID: **1606036-02AMS** Units: **mg/L** Analysis Date: **6/6/2016 07:36 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **HG1_160606A** SeqNo: **3862418** Prep Date: **6/6/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00188	0.00020	0.002	-0.000034	95.7	75-125	0			

MSD Sample ID: **1606036-02AMSD** Units: **mg/L** Analysis Date: **6/6/2016 07:38 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **HG1_160606A** SeqNo: **3862419** Prep Date: **6/6/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00191	0.00020	0.002	-0.000034	97.2	75-125	0.00188	1.58	20	

The following samples were analyzed in this batch: 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86872** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-86872-86872** Units: **mg/L** Analysis Date: **6/3/2016 06:52 PM**
Client ID: Run ID: **ICPMS1_160603A** SeqNo: **3860506** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	U	0.20								
Potassium	U	0.20								
Sodium	0.04569	0.20								J

LCS Sample ID: **LCS-86872-86872** Units: **mg/L** Analysis Date: **6/3/2016 06:58 PM**
Client ID: Run ID: **ICPMS1_160603A** SeqNo: **3860507** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	9.821	0.20	10	0	98.2	80-120	0			
Potassium	9.685	0.20	10	0	96.8	80-120	0			
Sodium	9.756	0.20	10	0	97.6	80-120	0			

MS Sample ID: **1606022-22BMS** Units: **mg/L** Analysis Date: **6/3/2016 10:06 PM**
Client ID: Run ID: **ICPMS1_160603A** SeqNo: **3860534** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	26.94	0.20	10	16.59	104	75-125	0			
Potassium	17.09	0.20	10	6.817	103	75-125	0			

MSD Sample ID: **1606022-22BMSD** Units: **mg/L** Analysis Date: **6/3/2016 10:12 PM**
Client ID: Run ID: **ICPMS1_160603A** SeqNo: **3860535** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Magnesium	27.43	0.20	10	16.59	108	75-125	26.94	1.8	20	
Potassium	17.58	0.20	10	6.817	108	75-125	17.09	2.83	20	

The following samples were analyzed in this batch: 1606036-01A 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86881** Instrument ID **ICPMS1** Method: **SW6020A**

MBLK Sample ID: **MBLK-86881-86881** Units: **mg/L** Analysis Date: **6/3/2016 06:52 PM**
Client ID: Run ID: **ICPMS1_160603A** SeqNo: **3861101** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	U	0.0050								
Arsenic	U	0.0050								
Beryllium	U	0.0020								
Cadmium	U	0.0020								
Chromium	U	0.0050								
Copper	U	0.0050								
Lead	U	0.0050								
Nickel	U	0.0050								
Selenium	U	0.0050								
Silver	U	0.0050								
Thallium	U	0.0020								
Zinc	U	0.010								

LCS Sample ID: **LCS-86881-86881** Units: **mg/L** Analysis Date: **6/3/2016 06:58 PM**
Client ID: Run ID: **ICPMS1_160603A** SeqNo: **3861102** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09319	0.0050	0.1	0	93.2	80-120	0			
Arsenic	0.09419	0.0050	0.1	0	94.2	80-120	0			
Beryllium	0.09906	0.0020	0.1	0	99.1	80-120	0			
Cadmium	0.09523	0.0020	0.1	0	95.2	80-120	0			
Chromium	0.09629	0.0050	0.1	0	96.3	80-120	0			
Lead	0.09527	0.0050	0.1	0	95.3	80-120	0			
Nickel	0.09464	0.0050	0.1	0	94.6	80-120	0			
Selenium	0.09318	0.0050	0.1	0	93.2	80-120	0			
Silver	0.0913	0.0050	0.1	0	91.3	80-120	0			
Thallium	0.09238	0.0020	0.1	0	92.4	80-120	0			

LCS Sample ID: **LCS-86881-86881** Units: **mg/L** Analysis Date: **6/6/2016 01:10 PM**
Client ID: Run ID: **ICPMS1_160606A** SeqNo: **3861853** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Copper	0.09524	0.0050	0.1	0	95.2	80-120	0			
Zinc	0.09252	0.010	0.1	0	92.5	80-120	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86881** Instrument ID **ICPMS1** Method: **SW6020A**

MS Sample ID: **1606022-22BMS** Units: **mg/L** Analysis Date: **6/3/2016 10:06 PM**
Client ID: Run ID: **ICPMS1_160603A** SeqNo: **3861104** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09693	0.0050	0.1	0.0002707	96.7	75-125	0			
Arsenic	0.1126	0.0050	0.1	0.009729	103	75-125	0			
Beryllium	0.09688	0.0020	0.1	0.00003079	96.8	75-125	0			
Cadmium	0.09992	0.0020	0.1	0.001723	98.2	75-125	0			
Chromium	0.1017	0.0050	0.1	0.0005981	101	75-125	0			
Copper	0.1088	0.0050	0.1	0.01401	94.8	75-125	0			
Lead	0.321	0.0050	0.1	0.2145	106	75-125	0			E
Nickel	0.1174	0.0050	0.1	0.01909	98.3	75-125	0			
Selenium	0.0981	0.0050	0.1	0.0002617	97.8	75-125	0			
Silver	0.08935	0.0050	0.1	0.00006581	89.3	75-125	0			
Thallium	0.09863	0.0020	0.1	0.0000354	98.6	75-125	0			
Zinc	0.09665	0.010	0.1	0.004326	92.3	75-125	0			

MSD Sample ID: **1606022-22BMSD** Units: **mg/L** Analysis Date: **6/3/2016 10:12 PM**
Client ID: Run ID: **ICPMS1_160603A** SeqNo: **3861105** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09717	0.0050	0.1	0.0002707	96.9	75-125	0.09693	0.247	20	
Arsenic	0.1181	0.0050	0.1	0.009729	108	75-125	0.1126	4.77	20	
Beryllium	0.09935	0.0020	0.1	0.00003079	99.3	75-125	0.09688	2.52	20	
Cadmium	0.1031	0.0020	0.1	0.001723	101	75-125	0.09992	3.13	20	
Chromium	0.1025	0.0050	0.1	0.0005981	102	75-125	0.1017	0.784	20	
Copper	0.1079	0.0050	0.1	0.01401	93.9	75-125	0.1088	0.831	20	
Lead	0.3248	0.0050	0.1	0.2145	110	75-125	0.321	1.18	20	E
Nickel	0.1146	0.0050	0.1	0.01909	95.5	75-125	0.1174	2.41	20	
Selenium	0.1002	0.0050	0.1	0.0002617	99.9	75-125	0.0981	2.12	20	
Silver	0.08866	0.0050	0.1	0.00006581	88.6	75-125	0.08935	0.775	20	
Thallium	0.1014	0.0020	0.1	0.0000354	101	75-125	0.09863	2.77	20	
Zinc	0.09616	0.010	0.1	0.004326	91.8	75-125	0.09665	0.508	20	

The following samples were analyzed in this batch: 1606036-01A 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **86800** Instrument ID **SVMS5** Method: **SW8270C**

MBLK Sample ID: **SBLKW1-86800-86800** Units: **µg/L** Analysis Date: **6/2/2016 06:13 PM**

Client ID: Run ID: **SVMS5_160602A** SeqNo: **3858925** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	1.0								
2,4,6-Trichlorophenol	U	1.0								
2,4-Dichlorophenol	U	1.0								
2,4-Dimethylphenol	U	1.0								
2,4-Dinitrophenol	U	5.0								
2,4-Dinitrotoluene	U	1.0								
2,6-Dinitrotoluene	U	1.0								
2-Chloronaphthalene	U	0.10								
2-Chlorophenol	U	1.0								
2-Nitrophenol	U	1.0								
3,3´-Dichlorobenzidine	U	5.0								
4,6-Dinitro-2-methylphenol	U	1.0								
4-Bromophenyl phenyl ether	U	1.0								
4-Chloro-3-methylphenol	U	1.0								
4-Chlorophenyl phenyl ether	U	1.0								
4-Nitrophenol	U	5.0								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Benzidine	U	5.0								
Benzo(a)anthracene	U	0.10								
Benzo(a)pyrene	U	0.10								
Benzo(b)fluoranthene	U	0.10								
Benzo(g,h,i)perylene	U	0.10								
Benzo(k)fluoranthene	U	0.10								
Bis(2-chloroethoxy)methane	U	1.0								
Bis(2-chloroethyl)ether	U	1.0								
Bis(2-chloroisopropyl)ether	U	1.0								
Bis(2-ethylhexyl)phthalate	U	1.0								
Butyl benzyl phthalate	U	1.0								
Chrysene	U	0.10								
Dibenzo(a,h)anthracene	U	0.10								
Diethyl phthalate	U	1.0								
Dimethyl phthalate	U	1.0								
Di-n-butyl phthalate	U	1.0								
Di-n-octyl phthalate	U	1.0								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Hexachlorobenzene	U	1.0								
Hexachlorobutadiene	U	1.0								
Hexachlorocyclopentadiene	U	5.0								
Hexachloroethane	U	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **86800** Instrument ID **SVMS5** Method: **SW8270C**

Indeno(1,2,3-cd)pyrene	U	0.10					
Naphthalene	U	0.10					
Nitrobenzene	U	1.0					
N-Nitrosodimethylamine	U	1.0					
N-Nitrosodi-n-propylamine	U	1.0					
N-Nitrosodiphenylamine	U	1.0					
Pentachlorophenol	U	5.0					
Phenanthrene	U	0.10					
Phenol	U	1.0					
Pyrene	U	0.10					
Surr: 2,4,6-Tribromophenol	*29.91*	0	*50*	0	*59.8*	*38-115*	0
Surr: 2-Fluorobiphenyl	*35.72*	0	*50*	0	*71.4*	*32-100*	0
Surr: 2-Fluorophenol	*21.53*	0	*50*	0	*43.1*	*22-59*	0
Surr: 4-Terphenyl-d14	*44.11*	0	*50*	0	*88.2*	*23-112*	0
Surr: Nitrobenzene-d5	*34.27*	0	*50*	0	*68.5*	*31-93*	0
Surr: Phenol-d6	*13.27*	0	*50*	0	*26.5*	*13-36*	0

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86800** Instrument ID **SVMS5** Method: **SW8270C**

LCS Sample ID: **SLCSW1-86800-86800** Units: **µg/L** Analysis Date: **6/2/2016 06:37 PM**
Client ID: Run ID: **SVMS5_160602A** SeqNo: **3858926** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	17.61	1.0	20	0	88	55-115	0			
2,4,6-Trichlorophenol	13.39	1.0	20	0	67	50-115	0			
2,4-Dichlorophenol	15.13	1.0	20	0	75.6	50-105	0			
2,4-Dimethylphenol	14.92	1.0	20	0	74.6	30-110	0			
2,4-Dinitrophenol	11.64	5.0	20	0	58.2	15-140	0			
2,4-Dinitrotoluene	14.43	1.0	20	0	72.2	50-120	0			
2,6-Dinitrotoluene	14.43	1.0	20	0	72.2	50-115	0			
2-Chloronaphthalene	14.9	0.10	20	0	74.5	50-105	0			
2-Chlorophenol	15.31	1.0	20	0	76.6	35-105	0			
2-Nitrophenol	15.19	1.0	20	0	76	40-115	0			
3,3´-Dichlorobenzidine	21.68	5.0	20	0	108	30-120	0			
4,6-Dinitro-2-methylphenol	15.48	1.0	20	0	77.4	40-130	0			
4-Bromophenyl phenyl ether	16.98	1.0	20	0	84.9	50-115	0			
4-Chloro-3-methylphenol	14.17	1.0	20	0	70.8	45-110	0			
4-Chlorophenyl phenyl ether	14.7	1.0	20	0	73.5	50-110	0			
4-Nitrophenol	8.17	5.0	20	0	40.8	1-58	0			
Acenaphthene	14.5	0.10	20	0	72.5	45-110	0			
Acenaphthylene	15.34	0.10	20	0	76.7	50-105	0			
Anthracene	17.41	0.10	20	0	87	55-110	0			
Benzo(a)anthracene	17.74	0.10	20	0	88.7	55-110	0			
Benzo(a)pyrene	17.64	0.10	20	0	88.2	55-110	0			
Benzo(b)fluoranthene	18.07	0.10	20	0	90.4	45-120	0			
Benzo(g,h,i)perylene	18.04	0.10	20	0	90.2	40-125	0			
Benzo(k)fluoranthene	18.29	0.10	20	0	91.4	45-125	0			
Bis(2-chloroethoxy)methane	16.28	1.0	20	0	81.4	45-105	0			
Bis(2-chloroethyl)ether	18.87	1.0	20	0	94.4	35-110	0			
Bis(2-chloroisopropyl)ether	16.26	1.0	20	0	81.3	25-130	0			
Bis(2-ethylhexyl)phthalate	16.8	1.0	20	0	84	40-125	0			
Butyl benzyl phthalate	16.84	1.0	20	0	84.2	45-115	0			
Chrysene	17.21	0.10	20	0	86	55-110	0			
Dibenzo(a,h)anthracene	18.32	0.10	20	0	91.6	40-125	0			
Diethyl phthalate	14.94	1.0	20	0	74.7	40-120	0			
Dimethyl phthalate	14.29	1.0	20	0	71.4	25-125	0			
Di-n-butyl phthalate	17.21	1.0	20	0	86	55-115	0			
Di-n-octyl phthalate	16.53	1.0	20	0	82.6	35-135	0			
Fluoranthene	17.01	0.10	20	0	85	55-115	0			
Fluorene	14.66	0.10	20	0	73.3	50-110	0			
Hexachlorobenzene	17.27	1.0	20	0	86.4	50-110	0			
Hexachlorobutadiene	14.79	1.0	20	0	74	25-105	0			
Hexachlorocyclopentadiene	12.43	5.0	20	0	62.2	25-105	0			
Hexachloroethane	15.42	1.0	20	0	77.1	30-95	0			
Indeno(1,2,3-cd)pyrene	16.85	0.10	20	0	84.2	45-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **86800** Instrument ID **SVMS5** Method: **SW8270C**

Naphthalene	15.21	0.10	20	0	76	40-100	0
Nitrobenzene	15.92	1.0	20	0	79.6	45-110	0
N-Nitrosodimethylamine	10.8	1.0	20	0	54	25-110	0
N-Nitrosodi-n-propylamine	16.39	1.0	20	0	82	35-130	0
N-Nitrosodiphenylamine	17.28	1.0	20	0	86.4	50-110	0
Pentachlorophenol	13.31	5.0	20	0	66.6	40-115	0
Phenanthrene	16.59	0.10	20	0	83	50-115	0
Phenol	6.36	1.0	20	0	31.8	12-43	0
Pyrene	19.17	0.10	20	0	95.8	50-130	0
Surr: 2,4,6-Tribromophenol	*39.18*	0	*50*	0	*78.4*	*38-115*	0
Surr: 2-Fluorobiphenyl	*37.75*	0	*50*	0	*75.5*	*32-100*	0
Surr: 2-Fluorophenol	*24.12*	0	*50*	0	*48.2*	*22-59*	0
Surr: 4-Terphenyl-d14	*47*	0	*50*	0	*94*	*23-112*	0
Surr: Nitrobenzene-d5	*38.1*	0	*50*	0	*76.2*	*31-93*	0
Surr: Phenol-d6	*15.37*	0	*50*	0	*30.7*	*13-36*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86800** Instrument ID **SVMS5** Method: **SW8270C**

LCSD Sample ID: **SLCSDW1-86800-86800** Units: **µg/L** Analysis Date: **6/2/2016 07:02 PM**

Client ID: Run ID: **SVMS5_160602A** SeqNo: **3858927** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	17.19	1.0	20	0	86	55-115	17.61	2.41	25	
2,4,6-Trichlorophenol	12.81	1.0	20	0	64	50-115	13.39	4.43	25	
2,4-Dichlorophenol	14.6	1.0	20	0	73	50-105	15.13	3.57	25	
2,4-Dimethylphenol	14.35	1.0	20	0	71.8	30-110	14.92	3.89	25	
2,4-Dinitrophenol	10.74	5.0	20	0	53.7	15-140	11.64	8.04	25	
2,4-Dinitrotoluene	14.01	1.0	20	0	70	50-120	14.43	2.95	25	
2,6-Dinitrotoluene	14.01	1.0	20	0	70	50-115	14.43	2.95	25	
2-Chloronaphthalene	14.56	0.10	20	0	72.8	50-105	14.9	2.31	25	
2-Chlorophenol	14.41	1.0	20	0	72	35-105	15.31	6.06	25	
2-Nitrophenol	15.34	1.0	20	0	76.7	40-115	15.19	0.983	25	
3,3´-Dichlorobenzidine	20.92	5.0	20	0	105	30-120	21.68	3.57	25	
4,6-Dinitro-2-methylphenol	14.05	1.0	20	0	70.2	40-130	15.48	9.69	25	
4-Bromophenyl phenyl ether	16.4	1.0	20	0	82	50-115	16.98	3.48	25	
4-Chloro-3-methylphenol	13.5	1.0	20	0	67.5	45-110	14.17	4.84	25	
4-Chlorophenyl phenyl ether	14.15	1.0	20	0	70.8	50-110	14.7	3.81	25	
4-Nitrophenol	8.37	5.0	20	0	41.8	1-58	8.17	2.42	25	
Acenaphthene	13.8	0.10	20	0	69	45-110	14.5	4.95	25	
Acenaphthylene	14.57	0.10	20	0	72.8	50-105	15.34	5.15	25	
Anthracene	16.98	0.10	20	0	84.9	55-110	17.41	2.5	25	
Benzo(a)anthracene	17.54	0.10	20	0	87.7	55-110	17.74	1.13	25	
Benzo(a)pyrene	17.04	0.10	20	0	85.2	55-110	17.64	3.46	25	
Benzo(b)fluoranthene	17.5	0.10	20	0	87.5	45-120	18.07	3.2	25	
Benzo(g,h,i)perylene	18.58	0.10	20	0	92.9	40-125	18.04	2.95	25	
Benzo(k)fluoranthene	17.92	0.10	20	0	89.6	45-125	18.29	2.04	25	
Bis(2-chloroethoxy)methane	15.51	1.0	20	0	77.6	45-105	16.28	4.84	25	
Bis(2-chloroethyl)ether	17.96	1.0	20	0	89.8	35-110	18.87	4.94	25	
Bis(2-chloroisopropyl)ether	15.84	1.0	20	0	79.2	25-130	16.26	2.59	25	
Bis(2-ethylhexyl)phthalate	16.22	1.0	20	0	81.1	40-125	16.8	3.51	25	
Butyl benzyl phthalate	16.03	1.0	20	0	80.2	45-115	16.84	4.93	25	
Chrysene	16.95	0.10	20	0	84.8	55-110	17.21	1.52	25	
Dibenzo(a,h)anthracene	18.76	0.10	20	0	93.8	40-125	18.32	2.37	25	
Diethyl phthalate	14.28	1.0	20	0	71.4	40-120	14.94	4.52	25	
Dimethyl phthalate	14.22	1.0	20	0	71.1	25-125	14.29	0.491	25	
Di-n-butyl phthalate	16.88	1.0	20	0	84.4	55-115	17.21	1.94	25	
Di-n-octyl phthalate	15.15	1.0	20	0	75.8	35-135	16.53	8.71	25	
Fluoranthene	16.46	0.10	20	0	82.3	55-115	17.01	3.29	25	
Fluorene	14.28	0.10	20	0	71.4	50-110	14.66	2.63	25	
Hexachlorobenzene	16.98	1.0	20	0	84.9	50-110	17.27	1.69	25	
Hexachlorobutadiene	14.71	1.0	20	0	73.6	25-105	14.79	0.542	25	
Hexachlorocyclopentadiene	11.86	5.0	20	0	59.3	25-105	12.43	4.69	25	
Hexachloroethane	13.96	1.0	20	0	69.8	30-95	15.42	9.94	25	
Indeno(1,2,3-cd)pyrene	17.75	0.10	20	0	88.8	45-125	16.85	5.2	25	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **86800** Instrument ID **SVMS5** Method: **SW8270C**

Naphthalene	14.65	0.10	20	0	73.2	40-100	15.21	3.75	25
Nitrobenzene	15.83	1.0	20	0	79.2	45-110	15.92	0.567	25
N-Nitrosodimethylamine	10.62	1.0	20	0	53.1	25-110	10.8	1.68	25
N-Nitrosodi-n-propylamine	15.33	1.0	20	0	76.6	35-130	16.39	6.68	25
N-Nitrosodiphenylamine	17.39	1.0	20	0	87	50-110	17.28	0.635	25
Pentachlorophenol	12.34	5.0	20	0	61.7	40-115	13.31	7.56	25
Phenanthrene	16.49	0.10	20	0	82.4	50-115	16.59	0.605	25
Phenol	6.23	1.0	20	0	31.2	12-43	6.36	2.07	25
Pyrene	18.37	0.10	20	0	91.8	50-130	19.17	4.26	25
Surr: 2,4,6-Tribromophenol	*37.89*	0	*50*	0	*75.8*	*38-115*	39.18	*3.35*	*25*
Surr: 2-Fluorobiphenyl	*36.85*	0	*50*	0	*73.7*	*32-100*	37.75	*2.41*	*25*
Surr: 2-Fluorophenol	*22.16*	0	*50*	0	*44.3*	*22-59*	24.12	*8.47*	*25*
Surr: 4-Terphenyl-d14	*43.44*	0	*50*	0	*86.9*	*23-112*	47	*7.87*	*25*
Surr: Nitrobenzene-d5	*36.9*	0	*50*	0	*73.8*	*31-93*	38.1	*3.2*	*25*
Surr: Phenol-d6	*14.05*	0	*50*	0	*28.1*	*13-36*	15.37	*8.97*	*25*

The following samples were analyzed in this batch: 1606036-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86859** Instrument ID **SVMS5** Method: **SW8270C**

MBLK Sample ID: **SBLKW1-86859-86859** Units: **µg/L** Analysis Date: **6/3/2016 07:09 PM**
Client ID: Run ID: **SVMS5_160603A** SeqNo: **3861342** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	U	1.0								
2,4,6-Trichlorophenol	U	1.0								
2,4-Dichlorophenol	U	1.0								
2,4-Dimethylphenol	U	1.0								
2,4-Dinitrophenol	U	5.0								
2,4-Dinitrotoluene	U	1.0								
2,6-Dinitrotoluene	U	1.0								
2-Chloronaphthalene	U	0.10								
2-Chlorophenol	U	1.0								
2-Nitrophenol	U	1.0								
3,3´-Dichlorobenzidine	U	5.0								
4,6-Dinitro-2-methylphenol	U	1.0								
4-Bromophenyl phenyl ether	U	1.0								
4-Chloro-3-methylphenol	U	1.0								
4-Chlorophenyl phenyl ether	U	1.0								
4-Nitrophenol	U	5.0								
Acenaphthene	U	0.10								
Acenaphthylene	U	0.10								
Anthracene	U	0.10								
Benzidine	U	5.0								
Benzo(a)anthracene	U	0.10								
Benzo(a)pyrene	U	0.10								
Benzo(b)fluoranthene	U	0.10								
Benzo(g,h,i)perylene	U	0.10								
Benzo(k)fluoranthene	U	0.10								
Bis(2-chloroethoxy)methane	U	1.0								
Bis(2-chloroethyl)ether	U	1.0								
Bis(2-chloroisopropyl)ether	U	1.0								
Bis(2-ethylhexyl)phthalate	U	1.0								
Butyl benzyl phthalate	U	1.0								
Chrysene	U	0.10								
Dibenzo(a,h)anthracene	U	0.10								
Diethyl phthalate	U	1.0								
Dimethyl phthalate	U	1.0								
Di-n-butyl phthalate	U	1.0								
Di-n-octyl phthalate	U	1.0								
Fluoranthene	U	0.10								
Fluorene	U	0.10								
Hexachlorobenzene	U	1.0								
Hexachlorobutadiene	U	1.0								
Hexachlorocyclopentadiene	U	5.0								
Hexachloroethane	U	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **86859** Instrument ID **SVMS5** Method: **SW8270C**

Indeno(1,2,3-cd)pyrene	U	0.10					
Naphthalene	U	0.10					
Nitrobenzene	U	1.0					
N-Nitrosodimethylamine	U	1.0					
N-Nitrosodi-n-propylamine	U	1.0					
N-Nitrosodiphenylamine	U	1.0					
Pentachlorophenol	U	5.0					
Phenanthrene	U	0.10					
Phenol	U	1.0					
Pyrene	U	0.10					
Surr: 2,4,6-Tribromophenol	*30.79*	0	*50*	0	*61.6*	*38-115*	0
Surr: 2-Fluorobiphenyl	*37.38*	0	*50*	0	*74.8*	*32-100*	0
Surr: 2-Fluorophenol	*20.15*	0	*50*	0	*40.3*	*22-59*	0
Surr: 4-Terphenyl-d14	*39.45*	0	*50*	0	*78.9*	*23-112*	0
Surr: Nitrobenzene-d5	*30.73*	0	*50*	0	*61.5*	*31-93*	0
Surr: Phenol-d6	*11.65*	0	*50*	0	*23.3*	*13-36*	0

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86859** Instrument ID **SVMS5** Method: **SW8270C**

LCS	Sample ID: **SLCSW1-86859-86859**				Units: **µg/L**			Analysis Date: **6/3/2016 07:34 PM**			
Client ID:		Run ID: **SVMS5_160603A**			SeqNo: **3861343**			Prep Date: **6/3/2016**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	18.36	1.0	20	0	91.8	55-115	0			
2,4,6-Trichlorophenol	16.33	1.0	20	0	81.6	50-115	0			
2,4-Dichlorophenol	14.97	1.0	20	0	74.8	50-105	0			
2,4-Dimethylphenol	13.62	1.0	20	0	68.1	30-110	0			
2,4-Dinitrophenol	11.86	5.0	20	0	59.3	15-140	0			
2,4-Dinitrotoluene	16.83	1.0	20	0	84.2	50-120	0			
2,6-Dinitrotoluene	16.83	1.0	20	0	84.2	50-115	0			
2-Chloronaphthalene	17.28	0.10	20	0	86.4	50-105	0			
2-Chlorophenol	14.89	1.0	20	0	74.4	35-105	0			
2-Nitrophenol	15.16	1.0	20	0	75.8	40-115	0			
3,3´-Dichlorobenzidine	18.64	5.0	20	0	93.2	30-120	0			
4,6-Dinitro-2-methylphenol	15.2	1.0	20	0	76	40-130	0			
4-Bromophenyl phenyl ether	16.46	1.0	20	0	82.3	50-115	0			
4-Chloro-3-methylphenol	14.82	1.0	20	0	74.1	45-110	0			
4-Chlorophenyl phenyl ether	17.49	1.0	20	0	87.4	50-110	0			
4-Nitrophenol	8.11	5.0	20	0	40.6	1-58	0			
Acenaphthene	15.8	0.10	20	0	79	45-110	0			
Acenaphthylene	17.34	0.10	20	0	86.7	50-105	0			
Anthracene	17.56	0.10	20	0	87.8	55-110	0			
Benzo(a)anthracene	17.6	0.10	20	0	88	55-110	0			
Benzo(a)pyrene	17.07	0.10	20	0	85.4	55-110	0			
Benzo(b)fluoranthene	17.78	0.10	20	0	88.9	45-120	0			
Benzo(g,h,i)perylene	19.64	0.10	20	0	98.2	40-125	0			
Benzo(k)fluoranthene	18.67	0.10	20	0	93.4	45-125	0			
Bis(2-chloroethoxy)methane	16.27	1.0	20	0	81.4	45-105	0			
Bis(2-chloroethyl)ether	19.53	1.0	20	0	97.6	35-110	0			
Bis(2-chloroisopropyl)ether	16.26	1.0	20	0	81.3	25-130	0			
Bis(2-ethylhexyl)phthalate	17.07	1.0	20	0	85.4	40-125	0			
Butyl benzyl phthalate	17.01	1.0	20	0	85	45-115	0			
Chrysene	17.29	0.10	20	0	86.4	55-110	0			
Dibenzo(a,h)anthracene	18.57	0.10	20	0	92.8	40-125	0			
Diethyl phthalate	17.5	1.0	20	0	87.5	40-120	0			
Dimethyl phthalate	17.61	1.0	20	0	88	25-125	0			
Di-n-butyl phthalate	18.39	1.0	20	0	92	55-115	0			
Di-n-octyl phthalate	16.46	1.0	20	0	82.3	35-135	0			
Fluoranthene	17.55	0.10	20	0	87.8	55-115	0			
Fluorene	16.97	0.10	20	0	84.8	50-110	0			
Hexachlorobenzene	17.17	1.0	20	0	85.8	50-110	0			
Hexachlorobutadiene	15.62	1.0	20	0	78.1	25-105	0			
Hexachlorocyclopentadiene	14.33	5.0	20	0	71.6	25-105	0			
Hexachloroethane	16.16	1.0	20	0	80.8	30-95	0			
Indeno(1,2,3-cd)pyrene	17.62	0.10	20	0	88.1	45-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **86859** Instrument ID **SVMS5** Method: **SW8270C**

Naphthalene	16.03	0.10	20	0	80.2	40-100	0
Nitrobenzene	15.81	1.0	20	0	79	45-110	0
N-Nitrosodimethylamine	9.63	1.0	20	0	48.2	25-110	0
N-Nitrosodi-n-propylamine	16.21	1.0	20	0	81	35-130	0
N-Nitrosodiphenylamine	16.87	1.0	20	0	84.4	50-110	0
Pentachlorophenol	14.99	5.0	20	0	75	40-115	0
Phenanthrene	16.75	0.10	20	0	83.8	50-115	0
Phenol	5.63	1.0	20	0	28.2	12-43	0
Pyrene	19.08	0.10	20	0	95.4	50-130	0
Surr: 2,4,6-Tribromophenol	*37.37*	0	*50*	0	*74.7*	*38-115*	0
Surr: 2-Fluorobiphenyl	*40.57*	0	*50*	0	*81.1*	*32-100*	0
Surr: 2-Fluorophenol	*20.28*	0	*50*	0	*40.6*	*22-59*	0
Surr: 4-Terphenyl-d14	*41.56*	0	*50*	0	*83.1*	*23-112*	0
Surr: Nitrobenzene-d5	*34.44*	0	*50*	0	*68.9*	*31-93*	0
Surr: Phenol-d6	*12.45*	0	*50*	0	*24.9*	*13-36*	0

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86859** Instrument ID **SVMS5** Method: **SW8270C**

MS Sample ID: **1606072-26A MS** Units: **µg/L** Analysis Date: **6/3/2016 07:58 PM**

Client ID: Run ID: **SVMS5_160603A** SeqNo: **3861544** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	378.2	20	400	0	94.6	55-115	0			
2,4,6-Trichlorophenol	319.2	20	400	0	79.8	50-115	0			
2,4-Dichlorophenol	299	20	400	0	74.8	50-105	0			
2,4-Dimethylphenol	259	20	400	0	64.8	30-110	0			
2,4-Dinitrophenol	290.8	100	400	0	72.7	15-140	0			
2,4-Dinitrotoluene	319.2	20	400	0	79.8	50-120	0			
2,6-Dinitrotoluene	319.2	20	400	0	79.8	50-115	0			
2-Chloronaphthalene	327.6	2.0	400	0	81.9	50-105	0			
2-Chlorophenol	285.6	20	400	0	71.4	35-105	0			
2-Nitrophenol	303	20	400	0	75.8	40-115	0			
3,3´-Dichlorobenzidine	331.8	100	400	0	83	30-120	0			
4,6-Dinitro-2-methylphenol	329.4	20	400	0	82.4	40-130	0			
4-Bromophenyl phenyl ether	325	20	400	0	81.2	50-115	0			
4-Chloro-3-methylphenol	297	20	400	0	74.2	45-110	0			
4-Chlorophenyl phenyl ether	338.6	20	400	0	84.6	50-110	0			
4-Nitrophenol	166.2	100	400	0	41.6	1-58	0			
Acenaphthene	312.8	2.0	400	0	78.2	45-110	0			
Acenaphthylene	324.4	2.0	400	0	81.1	50-105	0			
Anthracene	356.8	2.0	400	0	89.2	55-110	0			
Benzo(a)anthracene	356.8	2.0	400	0	89.2	55-110	0			
Benzo(a)pyrene	347.6	2.0	400	0	86.9	55-110	0			
Benzo(b)fluoranthene	365.2	2.0	400	0	91.3	45-120	0			
Benzo(g,h,i)perylene	377	2.0	400	0	94.2	40-125	0			
Benzo(k)fluoranthene	379.2	2.0	400	0	94.8	45-125	0			
Bis(2-chloroethoxy)methane	306.4	20	400	0	76.6	45-105	0			
Bis(2-chloroethyl)ether	387	20	400	0	96.8	35-110	0			
Bis(2-chloroisopropyl)ether	322.8	20	400	0	80.7	25-130	0			
Bis(2-ethylhexyl)phthalate	356.2	20	400	0	89	40-125	0			
Butyl benzyl phthalate	340.8	20	400	0	85.2	45-115	0			
Chrysene	362.2	2.0	400	0	90.6	55-110	0			
Dibenzo(a,h)anthracene	366.6	2.0	400	0	91.6	40-125	0			
Diethyl phthalate	339.8	20	400	0	85	40-120	0			
Dimethyl phthalate	339.2	20	400	0	84.8	25-125	0			
Di-n-butyl phthalate	377.6	20	400	1.6	94	55-115	0			
Di-n-octyl phthalate	350.4	20	400	0	87.6	35-135	0			
Fluoranthene	363.8	2.0	400	0	91	55-115	0			
Fluorene	329.2	2.0	400	0	82.3	50-110	0			
Hexachlorobenzene	353.8	20	400	0	88.4	50-110	0			
Hexachlorobutadiene	287	20	400	0	71.8	25-105	0			
Hexachlorocyclopentadiene	278.6	100	400	0	69.6	25-105	0			
Hexachloroethane	294.6	20	400	0	73.6	30-95	0			
Indeno(1,2,3-cd)pyrene	350.2	2.0	400	0	87.6	45-125	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **86859** Instrument ID **SVMS5** Method: **SW8270C**

Naphthalene	307.2	2.0	400	0	76.8	40-100	0
Nitrobenzene	304	20	400	0	76	45-110	0
N-Nitrosodimethylamine	200.2	20	400	0	50	25-110	0
N-Nitrosodi-n-propylamine	328.4	20	400	0	82.1	35-130	0
N-Nitrosodiphenylamine	345.8	20	400	0	86.4	50-110	0
Pentachlorophenol	397.4	100	400	0	99.4	40-115	0
Phenanthrene	340.8	2.0	400	0	85.2	50-115	0
Phenol	102.8	20	400	0	25.7	12-43	0
Pyrene	375	2.0	400	0	93.8	50-130	0
Surr: 2,4,6-Tribromophenol	*661.8*	0	*1000*	0	*66.2*	*38-115*	0
Surr: 2-Fluorobiphenyl	*684.6*	0	*1000*	0	*68.5*	*32-100*	0
Surr: 2-Fluorophenol	*361.6*	0	*1000*	0	*36.2*	*22-59*	0
Surr: 4-Terphenyl-d14	*738.8*	0	*1000*	0	*73.9*	*23-112*	0
Surr: Nitrobenzene-d5	*604.8*	0	*1000*	0	*60.5*	*31-93*	0
Surr: Phenol-d6	*221*	0	*1000*	0	*22.1*	*13-36*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86859** Instrument ID **SVMS5** Method: **SW8270C**

MSD Sample ID: **1606072-26A MSD** Units: **µg/L** Analysis Date: **6/3/2016 08:22 PM**

Client ID: Run ID: **SVMS5_160603A** SeqNo: **3861545** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,2-Diphenylhydrazine	394.4	20	400	0	98.6	55-115	378.2	4.19	30	
2,4,6-Trichlorophenol	329.2	20	400	0	82.3	50-115	319.2	3.08	30	
2,4-Dichlorophenol	324.2	20	400	0	81	50-105	299	8.09	30	
2,4-Dimethylphenol	288.4	20	400	0	72.1	30-110	259	10.7	30	
2,4-Dinitrophenol	330.6	100	400	0	82.6	15-140	290.8	12.8	30	
2,4-Dinitrotoluene	365	20	400	0	91.2	50-120	319.2	13.4	30	
2,6-Dinitrotoluene	365	20	400	0	91.2	50-115	319.2	13.4	30	
2-Chloronaphthalene	342.6	2.0	400	0	85.6	50-105	327.6	4.48	30	
2-Chlorophenol	318.8	20	400	0	79.7	35-105	285.6	11	30	
2-Nitrophenol	335.6	20	400	0	83.9	40-115	303	10.2	30	
3,3´-Dichlorobenzidine	348.8	100	400	0	87.2	30-120	331.8	5	30	
4,6-Dinitro-2-methylphenol	370	20	400	0	92.5	40-130	329.4	11.6	30	
4-Bromophenyl phenyl ether	352.4	20	400	0	88.1	50-115	325	8.09	30	
4-Chloro-3-methylphenol	342.2	20	400	0	85.6	45-110	297	14.1	30	
4-Chlorophenyl phenyl ether	365.4	20	400	0	91.4	50-110	338.6	7.61	30	
4-Nitrophenol	134	100	400	0	33.5	1-58	166.2	21.5	30	
Acenaphthene	333.8	2.0	400	0	83.4	45-110	312.8	6.5	30	
Acenaphthylene	351	2.0	400	0	87.8	50-105	324.4	7.88	30	
Anthracene	380.4	2.0	400	0	95.1	55-110	356.8	6.4	30	
Benzo(a)anthracene	379.6	2.0	400	0	94.9	55-110	356.8	6.19	30	
Benzo(a)pyrene	367.6	2.0	400	0	91.9	55-110	347.6	5.59	30	
Benzo(b)fluoranthene	387.6	2.0	400	0	96.9	45-120	365.2	5.95	30	
Benzo(g,h,i)perylene	399.6	2.0	400	0	99.9	40-125	377	5.82	30	
Benzo(k)fluoranthene	397	2.0	400	0	99.2	45-125	379.2	4.59	30	
Bis(2-chloroethoxy)methane	354.4	20	400	0	88.6	45-105	306.4	14.5	30	
Bis(2-chloroethyl)ether	438.4	20	400	0	110	35-110	387	12.5	30	
Bis(2-chloroisopropyl)ether	355.8	20	400	0	89	25-130	322.8	9.73	30	
Bis(2-ethylhexyl)phthalate	399	20	400	0	99.8	40-125	356.2	11.3	30	
Butyl benzyl phthalate	364.8	20	400	0	91.2	45-115	340.8	6.8	30	
Chrysene	385.8	2.0	400	0	96.4	55-110	362.2	6.31	30	
Dibenzo(a,h)anthracene	384	2.0	400	0	96	40-125	366.6	4.64	30	
Diethyl phthalate	372.6	20	400	0	93.2	40-120	339.8	9.21	30	
Dimethyl phthalate	362.2	20	400	0	90.6	25-125	339.2	6.56	30	
Di-n-butyl phthalate	409.6	20	400	1.6	102	55-115	377.6	8.13	30	
Di-n-octyl phthalate	361	20	400	0	90.2	35-135	350.4	2.98	30	
Fluoranthene	408	2.0	400	0	102	55-115	363.8	11.5	30	
Fluorene	354.4	2.0	400	0	88.6	50-110	329.2	7.37	30	
Hexachlorobenzene	351	20	400	0	87.8	50-110	353.8	0.795	30	
Hexachlorobutadiene	323.8	20	400	0	81	25-105	287	12	30	
Hexachlorocyclopentadiene	281.8	100	400	0	70.4	25-105	278.6	1.14	30	
Hexachloroethane	326.6	20	400	0	81.6	30-95	294.6	10.3	30	
Indeno(1,2,3-cd)pyrene	378.6	2.0	400	0	94.6	45-125	350.2	7.79	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **86859** Instrument ID **SVMS5** Method: **SW8270C**

Naphthalene	336.2	2.0	400	0	84	40-100	307.2	9.01	30
Nitrobenzene	329.2	20	400	0	82.3	45-110	304	7.96	30
N-Nitrosodimethylamine	253.2	20	400	0	63.3	25-110	200.2	23.4	30
N-Nitrosodi-n-propylamine	364	20	400	0	91	35-130	328.4	10.3	30
N-Nitrosodiphenylamine	363.2	20	400	0	90.8	50-110	345.8	4.91	30
Pentachlorophenol	404.4	100	400	0	101	40-115	397.4	1.75	30
Phenanthrene	355.6	2.0	400	0	88.9	50-115	340.8	4.25	30
Phenol	124.6	20	400	0	31.2	12-43	102.8	19.2	30
Pyrene	380.4	2.0	400	0	95.1	50-130	375	1.43	30
Surr: 2,4,6-Tribromophenol	*756.4*	0	*1000*	0	*75.6*	*38-115*	661.8	*13.3*	*40*
Surr: 2-Fluorobiphenyl	*733.6*	0	*1000*	0	*73.4*	*32-100*	684.6	*6.91*	*40*
Surr: 2-Fluorophenol	*430.8*	0	*1000*	0	*43.1*	*22-59*	361.6	*17.5*	*40*
Surr: 4-Terphenyl-d14	*772*	0	*1000*	0	*77.2*	*23-112*	738.8	*4.4*	*40*
Surr: Nitrobenzene-d5	*679.8*	0	*1000*	0	*68*	*31-93*	604.8	*11.7*	*40*
Surr: Phenol-d6	*265.8*	0	*1000*	0	*26.6*	*13-36*	221	*18.4*	*40*

The following samples were analyzed in this batch: 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188849C** Instrument ID **VMS7** Method: **SW8260B**

MBLK	Sample ID: **VBLKW1-160603-R188849C**				Units: **µg/L**			Analysis Date: **6/3/2016 01:23 PM**		
Client ID:		Run ID: **VMS7_160603A**			SeqNo: **3861093**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	U	1.0								
1,1,2,2-Tetrachloroethane	U	1.0								
1,1,2-Trichloroethane	U	1.0								
1,1-Dichloroethane	U	1.0								
1,1-Dichloroethene	U	1.0								
1,2-Dichlorobenzene	U	1.0								
1,2-Dichloroethane	U	1.0								
1,2-Dichloropropane	U	1.0								
1,3-Dichlorobenzene	U	1.0								
1,4-Dichlorobenzene	U	1.0								
Acrolein	U	10								
Acrylonitrile	U	1.0								
Benzene	U	1.0								
Bromodichloromethane	U	1.0								
Bromoform	U	1.0								
Bromomethane	U	1.0								
Carbon tetrachloride	U	1.0								
Chlorobenzene	U	1.0								
Chloroethane	U	1.0								
Chloroform	U	1.0								
Chloromethane	U	1.0								
cis-1,3-Dichloropropene	U	1.0								
Dibromochloromethane	U	1.0								
Methylene chloride	U	5.0								
Tetrachloroethene	U	1.0								
Toluene	U	1.0								
trans-1,2-Dichloroethene	U	1.0								
trans-1,3-Dichloropropene	U	1.0								
Trichloroethene	U	1.0								
Vinyl chloride	U	1.0								
Surr: 1,2-Dichloroethane-d4	*19.98*	0	*20*	0	*99.9*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*19.83*	0	*20*	0	*99.2*	*80-110*	0			
Surr: Dibromofluoromethane	*19.14*	0	*20*	0	*95.7*	*85-115*	0			
Surr: Toluene-d8	*18.77*	0	*20*	0	*93.8*	*85-110*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188849C** Instrument ID **VMS7** Method: **SW8260B**

LCS	Sample ID: **VLCSW1-160603-R188849C**				Units: **µg/L**		Analysis Date: **6/3/2016 12:08 PM**			
Client ID:		Run ID: **VMS7_160603A**			SeqNo: **3861092**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	22.62	1.0	20	0	113	75-130	0			
1,1,2,2-Tetrachloroethane	20.08	1.0	20	0	100	75-130	0			
1,1,2-Trichloroethane	21.51	1.0	20	0	108	75-125	0			
1,1-Dichloroethane	22.44	1.0	20	0	112	75-133	0			
1,1-Dichloroethene	21.14	1.0	20	0	106	70-145	0			
1,2-Dichlorobenzene	22.23	1.0	20	0	111	70-130	0			
1,2-Dichloroethane	23.44	1.0	20	0	117	78-125	0			
1,2-Dichloropropane	22.3	1.0	20	0	112	75-125	0			
1,3-Dichlorobenzene	23.67	1.0	20	0	118	75-130	0			
1,4-Dichlorobenzene	24.57	1.0	20	0	123	75-130	0			
Acrylonitrile	21.69	1.0	20	0	108	60-140	0			
Benzene	22.68	1.0	20	0	113	85-125	0			
Bromodichloromethane	22.38	1.0	20	0	112	75-125	0			
Bromoform	16.46	1.0	20	0	82.3	60-125	0			
Bromomethane	26.12	1.0	20	0	131	30-185	0			
Carbon tetrachloride	22.23	1.0	20	0	111	65-140	0			
Chlorobenzene	21.67	1.0	20	0	108	80-120	0			
Chloroethane	20.14	1.0	20	0	101	50-140	0			
Chloroform	21.6	1.0	20	0	108	80-130	0			
Chloromethane	22.92	1.0	20	0	115	50-130	0			
cis-1,3-Dichloropropene	22.9	1.0	20	0	114	70-130	0			
Dibromochloromethane	16.67	1.0	20	0	83.4	60-115	0			
Methylene chloride	20.18	5.0	20	0	101	75-140	0			
Tetrachloroethene	22.99	1.0	20	0	115	77-138	0			
Toluene	21.65	1.0	20	0	108	85-125	0			
trans-1,2-Dichloroethene	21.07	1.0	20	0	105	80-140	0			
trans-1,3-Dichloropropene	20.72	1.0	20	0	104	81-123	0			
Trichloroethene	23.21	1.0	20	0	116	84-130	0			
Vinyl chloride	23.36	1.0	20	0	117	50-136	0			
Surr: 1,2-Dichloroethane-d4	*21.01*	0	*20*	0	*105*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*20.33*	0	*20*	0	*102*	*80-110*	0			
Surr: Dibromofluoromethane	*20.29*	0	*20*	0	*101*	*85-115*	0			
Surr: Toluene-d8	*18.89*	0	*20*	0	*94.4*	*85-110*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188849C** Instrument ID **VMS7** Method: **SW8260B**

MS Sample ID: **1606110-03A MS** Units: **µg/L** Analysis Date: **6/3/2016 09:22 PM**
Client ID: Run ID: **VMS7_160603A** SeqNo: **3861098** Prep Date: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	2306	100	2000	0	115	75-130	0			
1,1,2,2-Tetrachloroethane	2165	100	2000	0	108	75-130	0			
1,1,2-Trichloroethane	2087	100	2000	0	104	75-125	0			
1,1-Dichloroethane	2242	100	2000	0	112	75-133	0			
1,1-Dichloroethene	2103	100	2000	0	105	70-145	0			
1,2-Dichlorobenzene	2055	100	2000	0	103	70-130	0			
1,2-Dichloroethane	2374	100	2000	0	119	78-125	0			
1,2-Dichloropropane	2290	100	2000	0	114	75-125	0			
1,3-Dichlorobenzene	2126	100	2000	0	106	75-130	0			
1,4-Dichlorobenzene	2209	100	2000	0	110	75-130	0			
Acrylonitrile	1987	100	2000	0	99.4	60-140	0			
Benzene	2343	100	2000	0	117	85-125	0			
Bromodichloromethane	2195	100	2000	0	110	75-125	0			
Bromoform	1551	100	2000	0	77.6	60-125	0			
Bromomethane	2227	100	2000	0	111	30-185	0			
Carbon tetrachloride	2227	100	2000	0	111	65-140	0			
Chlorobenzene	2146	100	2000	0	107	80-120	0			
Chloroethane	1980	100	2000	0	99	50-140	0			
Chloroform	2159	100	2000	0	108	80-130	0			
Chloromethane	2197	100	2000	0	110	50-130	0			
cis-1,3-Dichloropropene	2215	100	2000	0	111	70-130	0			
Dibromochloromethane	1576	100	2000	0	78.8	60-115	0			
Methylene chloride	1998	500	2000	0	99.9	75-140	0			
Tetrachloroethene	2318	100	2000	0	116	77-138	0			
Toluene	2175	100	2000	0	109	85-125	0			
trans-1,2-Dichloroethene	2059	100	2000	0	103	80-140	0			
trans-1,3-Dichloropropene	1790	100	2000	0	89.5	81-123	0			
Trichloroethene	2371	100	2000	0	119	84-130	0			
Vinyl chloride	2415	100	2000	0	121	50-136	0			
Surr: 1,2-Dichloroethane-d4	*2072*	0	*2000*	0	*104*	*75-120*	0			
Surr: 4-Bromofluorobenzene	*2034*	0	*2000*	0	*102*	*80-110*	0			
Surr: Dibromofluoromethane	*2006*	0	*2000*	0	*100*	*85-115*	0			
Surr: Toluene-d8	*1870*	0	*2000*	0	*93.5*	*85-110*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188849C** Instrument ID **VMS7** Method: **SW8260B**

MSD Sample ID: **1606110-03A MSD** Units: **µg/L** Analysis Date: **6/3/2016 09:47 PM**
Client ID: Run ID: **VMS7_160603A** SeqNo: **3861099** Prep Date: DF: **100**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	2343	100	2000	0	117	75-130	2306	1.59	30	
1,1,2,2-Tetrachloroethane	2231	100	2000	0	112	75-130	2165	3	30	
1,1,2-Trichloroethane	2116	100	2000	0	106	75-125	2087	1.38	30	
1,1-Dichloroethane	2292	100	2000	0	115	75-133	2242	2.21	30	
1,1-Dichloroethene	2196	100	2000	0	110	70-145	2103	4.33	30	
1,2-Dichlorobenzene	2135	100	2000	0	107	70-130	2055	3.82	30	
1,2-Dichloroethane	2341	100	2000	0	117	78-125	2374	1.4	30	
1,2-Dichloropropane	2298	100	2000	0	115	75-125	2290	0.349	30	
1,3-Dichlorobenzene	2182	100	2000	0	109	75-130	2126	2.6	30	
1,4-Dichlorobenzene	2341	100	2000	0	117	75-130	2209	5.8	30	
Acrylonitrile	1962	100	2000	0	98.1	60-140	1987	1.27	30	
Benzene	2343	100	2000	0	117	85-125	2343	0	30	
Bromodichloromethane	2183	100	2000	0	109	75-125	2195	0.548	30	
Bromoform	1595	100	2000	0	79.8	60-125	1551	2.8	30	
Bromomethane	2416	100	2000	0	121	30-185	2227	8.14	30	
Carbon tetrachloride	2252	100	2000	0	113	65-140	2227	1.12	30	
Chlorobenzene	2153	100	2000	0	108	80-120	2146	0.326	30	
Chloroethane	2036	100	2000	0	102	50-140	1980	2.79	30	
Chloroform	2226	100	2000	0	111	80-130	2159	3.06	30	
Chloromethane	2270	100	2000	0	114	50-130	2197	3.27	30	
cis-1,3-Dichloropropene	2243	100	2000	0	112	70-130	2215	1.26	30	
Dibromochloromethane	1622	100	2000	0	81.1	60-115	1576	2.88	30	
Methylene chloride	2059	500	2000	0	103	75-140	1998	3.01	30	
Tetrachloroethene	2389	100	2000	0	119	77-138	2318	3.02	30	
Toluene	2223	100	2000	0	111	85-125	2175	2.18	30	
trans-1,2-Dichloroethene	2096	100	2000	0	105	80-140	2059	1.78	30	
trans-1,3-Dichloropropene	1922	100	2000	0	96.1	81-123	1790	7.11	30	
Trichloroethene	2397	100	2000	0	120	84-130	2371	1.09	30	
Vinyl chloride	2579	100	2000	0	129	50-136	2415	6.57	30	
Surr: 1,2-Dichloroethane-d4	*2044*	0	*2000*	0	*102*	*75-120*	2072	*1.36*	*30*	
Surr: 4-Bromofluorobenzene	*2037*	0	*2000*	0	*102*	*80-110*	2034	*0.147*	*30*	
Surr: Dibromofluoromethane	*2006*	0	*2000*	0	*100*	*85-115*	2006	*0*	*30*	
Surr: Toluene-d8	*1893*	0	*2000*	0	*94.6*	*85-110*	1870	*1.22*	*30*	

The following samples were analyzed in this batch: 1606036-01A 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86847** Instrument ID **LACHAT** Method: **A4500-NH3 G-97**

MBLK Sample ID: **MBLK-86847-86847** Units: **mg/L** Analysis Date: **6/3/2016 09:18 AM**
Client ID: Run ID: **LACHAT_160603A** SeqNo: **3858573** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	U	1.0								

LCS Sample ID: **LCS-86847-86847** Units: **mg/L** Analysis Date: **6/3/2016 09:18 AM**
Client ID: Run ID: **LACHAT_160603A** SeqNo: **3858574** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	10.12	1.0	10	0	101	90-110	0			

MS Sample ID: **16051623-01B MS** Units: **mg/L** Analysis Date: **6/3/2016 09:18 AM**
Client ID: Run ID: **LACHAT_160603A** SeqNo: **3858577** Prep Date: **6/2/2016** DF: **25**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	268.5	25	10	249.6	188	75-125	0			SO

MSD Sample ID: **16051623-01B MSD** Units: **mg/L** Analysis Date: **6/3/2016 09:18 AM**
Client ID: Run ID: **LACHAT_160603A** SeqNo: **3858578** Prep Date: **6/2/2016** DF: **25**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	263.2	25	10	249.6	136	75-125	268.5	1.97	30	SO

LCS2 Sample ID: **LCS2-86847-86847** Units: **mg/L** Analysis Date: **6/3/2016 09:18 AM**
Client ID: Run ID: **LACHAT_160603A** SeqNo: **3858580** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	9.293	1.0	10	0	92.9	90-110	0			

The following samples were analyzed in this batch: 1606036-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86849** Instrument ID **WETCHEM** Method: **A5210B-01**

MBLK Sample ID: **MBLK-86849-86849** Units: **mg/L** Analysis Date: **6/7/2016 09:55 AM**
Client ID: Run ID: **WETCHEM_160607A** SeqNo: **3863190** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	U	2.0								

LCS Sample ID: **LCS-86849-86849** Units: **mg/L** Analysis Date: **6/7/2016 09:55 AM**
Client ID: Run ID: **WETCHEM_160607A** SeqNo: **3863191** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	210.8	2.0	198	0	106	85-115	0			

DUP Sample ID: **1606062-01A DUP** Units: **mg/L** Analysis Date: **6/7/2016 09:55 AM**
Client ID: Run ID: **WETCHEM_160607A** SeqNo: **3863195** Prep Date: **6/2/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	595	2.0	0	0	0	0-0	631	5.87	20	

The following samples were analyzed in this batch: 1606036-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86905** Instrument ID **WETCHEM** Method: **A5210B-01**

MBLK Sample ID: **MBLK-86905-86905** Units: **mg/L** Analysis Date: **6/8/2016 09:24 AM**
Client ID: Run ID: **WETCHEM_160608B** SeqNo: **3865250** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	U	2.0								

LCS Sample ID: **LCS-86905-86905** Units: **mg/L** Analysis Date: **6/8/2016 09:24 AM**
Client ID: Run ID: **WETCHEM_160608B** SeqNo: **3865251** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	175.5	2.0	198	0	88.6	85-115	0			

DUP Sample ID: **1606212-02A DUP** Units: **mg/L** Analysis Date: **6/8/2016 09:24 AM**
Client ID: Run ID: **WETCHEM_160608B** SeqNo: **3865256** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Biochemical Oxygen Demand	2731	2.0	0	0	0	0-0	2603	4.78	20	

The following samples were analyzed in this batch: 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86934** Instrument ID **LACHAT** Method: **SW9012B**

MBLK Sample ID: **MBLK-86934-86934** Units: **mg/L** Analysis Date: **6/6/2016 01:38 PM**
Client ID: Run ID: **LACHAT_160606C** SeqNo: **3861793** Prep Date: **6/6/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	U	0.0050								

LCS Sample ID: **LCS-86934-86934** Units: **mg/L** Analysis Date: **6/6/2016 01:38 PM**
Client ID: Run ID: **LACHAT_160606C** SeqNo: **3861794** Prep Date: **6/6/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	0.2324	0.0050	0.25	0	93	80-120	0			

MS Sample ID: **1606036-02A MS** Units: **mg/L** Analysis Date: **6/6/2016 01:38 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT_160606C** SeqNo: **3861797** Prep Date: **6/6/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	0.2198	0.0050	0.25	0	87.9	75-125	0			H

MSD Sample ID: **1606036-02A MSD** Units: **mg/L** Analysis Date: **6/6/2016 01:38 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT_160606C** SeqNo: **3861798** Prep Date: **6/6/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Cyanide, Total	0.23	0.0050	0.25	0	92	75-125	0.2198	4.54	30	H

The following samples were analyzed in this batch: 1606036-01A 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **86950** Instrument ID **LACHAT** Method: **A4500-NH3 G-97**

MBLK Sample ID: **MBLK-86950-86950** Units: **mg/L** Analysis Date: **6/7/2016 10:52 AM**
Client ID: Run ID: **LACHAT_160607B** SeqNo: **3863466** Prep Date: **6/6/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	U	1.0								

LCS Sample ID: **LCS-86950-86950** Units: **mg/L** Analysis Date: **6/7/2016 10:52 AM**
Client ID: Run ID: **LACHAT_160607B** SeqNo: **3863467** Prep Date: **6/6/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	9.972	1.0	10	0	99.7	90-110	0			

MS Sample ID: **1606048-01C MS** Units: **mg/L** Analysis Date: **6/7/2016 10:52 AM**
Client ID: Run ID: **LACHAT_160607B** SeqNo: **3863471** Prep Date: **6/6/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	8.745	1.0	10	0	87.4	75-125	0			

MSD Sample ID: **1606048-01C MSD** Units: **mg/L** Analysis Date: **6/7/2016 10:52 AM**
Client ID: Run ID: **LACHAT_160607B** SeqNo: **3863472** Prep Date: **6/6/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	8.787	1.0	10	0	87.9	75-125	8.745	0.479	30	

LCS2 Sample ID: **LCS2-86950-86950** Units: **mg/L** Analysis Date: **6/7/2016 10:52 AM**
Client ID: Run ID: **LACHAT_160607B** SeqNo: **3863475** Prep Date: **6/6/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Total Kjeldahl	9.807	1.0	10	0	98.1	90-110	0			

The following samples were analyzed in this batch: 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188767** Instrument ID **LACHAT2** Method: **A4500-P E-99**

MBLK Sample ID: **MBLK-R188767** Units: **mg/L** Analysis Date: **6/2/2016 01:29 PM**
Client ID: Run ID: **LACHAT2_160602B** SeqNo: **3857265** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	U	0.050								

LCS Sample ID: **LCS-R188767** Units: **mg/L** Analysis Date: **6/2/2016 01:29 PM**
Client ID: Run ID: **LACHAT2_160602B** SeqNo: **3857266** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	1.08	0.050	1	0	108	90-110	0			

MS Sample ID: **1606036-01A MS** Units: **mg/L** Analysis Date: **6/2/2016 01:29 PM**
Client ID: **RCK001:33/66:SB16-1162-3** Run ID: **LACHAT2_160602B** SeqNo: **3857268** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	1.08	0.050	1	0.04104	104	90-110	0			H

MSD Sample ID: **1606036-01A MSD** Units: **mg/L** Analysis Date: **6/2/2016 01:29 PM**
Client ID: **RCK001:33/66:SB16-1162-3** Run ID: **LACHAT2_160602B** SeqNo: **3857269** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	1.136	0.050	1	0.04104	109	90-110	1.08	5.05	20	H

The following samples were analyzed in this batch: 1606036-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188776** Instrument ID **Titrator 1** Method: **SW9040C**

LCS Sample ID: **WLCSW1-160602-R188776** Units: **s.u.** Analysis Date: **6/2/2016 12:15 PM**
Client ID: Run ID: **TITRATOR 1_160602A** SeqNo: **3857431** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH (laboratory)	4.14	0	4.4	0	94.1	90-110	0			

DUP Sample ID: **1606008-01C DUP** Units: **s.u.** Analysis Date: **6/2/2016 12:15 PM**
Client ID: Run ID: **TITRATOR 1_160602A** SeqNo: **3857437** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH (laboratory)	7.38	0	0	0	0		7.36	0.271	20	

The following samples were analyzed in this batch: 1606036-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188785** Instrument ID **WETCHEM** Method: **A4500-NO2 B**

MBLK Sample ID: **MB-R188785-R188785** Units: **mg/L** Analysis Date: **6/2/2016 12:50 PM**
Client ID: Run ID: **WETCHEM_160602H** SeqNo: **3857466** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	U	0.020								

LCS Sample ID: **LCS-R188785-R188785** Units: **mg/L** Analysis Date: **6/2/2016 12:50 PM**
Client ID: Run ID: **WETCHEM_160602H** SeqNo: **3857467** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	0.1961	0.020	0.2	0	98	80-120	0			

MS Sample ID: **1606036-01A MS** Units: **mg/L** Analysis Date: **6/2/2016 12:50 PM**
Client ID: **RCK001:33/66:SB16-1162-3** Run ID: **WETCHEM_160602H** SeqNo: **3857469** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	0.1899	0.020	0.2	0.0033	93.3	75-125	0			H

MSD Sample ID: **1606036-01A MSD** Units: **mg/L** Analysis Date: **6/2/2016 12:50 PM**
Client ID: **RCK001:33/66:SB16-1162-3** Run ID: **WETCHEM_160602H** SeqNo: **3857470** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	0.1879	0.020	0.2	0.0033	92.3	75-125	0.1899	1.06	20	H

The following samples were analyzed in this batch: 1606036-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188794** Instrument ID **GALLERY** Method: **A4500-Cl E-97**

MBLK Sample ID: **WBLKW1-160602-R188794** Units: **mg/L** Analysis Date: **6/2/2016 01:40 PM**
Client ID: Run ID: **GALLERY_160602A** SeqNo: **3857595** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	1.0								

MS Sample ID: **1606010-12A MS** Units: **mg/L** Analysis Date: **6/2/2016 01:40 PM**
Client ID: Run ID: **GALLERY_160602A** SeqNo: **3857613** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	54.01	1.0	50	4.31	99.4	75-125	0			

MSD Sample ID: **1606010-12A MSD** Units: **mg/L** Analysis Date: **6/2/2016 01:40 PM**
Client ID: Run ID: **GALLERY_160602A** SeqNo: **3857614** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	53.91	1.0	50	4.31	99.2	75-125	54.01	0.185	25	

LCS1 Sample ID: **WLCS1W1-160602-R188794** Units: **mg/L** Analysis Date: **6/2/2016 01:40 PM**
Client ID: Run ID: **GALLERY_160602A** SeqNo: **3857596** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	9.844	1.0	10	0	98.4	80-120	0			

LCS2 Sample ID: **WLCS2W1-160602-R188794** Units: **mg/L** Analysis Date: **6/2/2016 01:40 PM**
Client ID: Run ID: **GALLERY_160602A** SeqNo: **3857610** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	49.34	1.0	50	0	98.7	80-120	0			

The following samples were analyzed in this batch: 1606036-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188799B** Instrument ID **TOC2** Method: **A5310C-00**

MBLK	Sample ID: **MBLK-R188799B**			Units: **mg/L**			Analysis Date: **6/2/2016 02:12 PM**			
Client ID:	Run ID: **TOC2_160602A**			SeqNo: **3857672**			Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	U	0.50								

LCS	Sample ID: **LCS-R188799B**			Units: **mg/L**			Analysis Date: **6/2/2016 02:12 PM**			
Client ID:	Run ID: **TOC2_160602A**			SeqNo: **3857673**			Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	5.115	0.50	5	0	102	91-110	0			

The following samples were analyzed in this batch: 1606036-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188868** Instrument ID **WETCHEM** Method: **A4500-NO2 B**

MBLK	Sample ID: **MB-R188868-R188868**			Units: **mg/L**			Analysis Date: **6/3/2016 10:45 PM**			
Client ID:	Run ID: **WETCHEM_160603K**			SeqNo: **3859565**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	U	0.020								

LCS	Sample ID: **LCS-R188868-R188868**			Units: **mg/L**			Analysis Date: **6/3/2016 10:45 PM**			
Client ID:	Run ID: **WETCHEM_160603K**			SeqNo: **3859566**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	0.2005	0.020	0.2	0	100	80-120	0			

MS	Sample ID: **1606122-01C MS**			Units: **mg/L**			Analysis Date: **6/3/2016 10:45 PM**			
Client ID:	Run ID: **WETCHEM_160603K**			SeqNo: **3859574**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	0.1832	0.020	0.2	0.0124	85.4	75-125	0			

MSD	Sample ID: **1606122-01C MSD**			Units: **mg/L**			Analysis Date: **6/3/2016 10:45 PM**			
Client ID:	Run ID: **WETCHEM_160603K**			SeqNo: **3859575**		Prep Date:		DF: **1**		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrite	0.1849	0.020	0.2	0.0124	86.2	75-125	0.1832	0.924	20	

The following samples were analyzed in this batch: 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188874b** Instrument ID **Titrator 1** Method: **SW9040C**

LCS	Sample ID: **WLCSW1-160603-R188874b**				Units: **s.u.**			Analysis Date: **6/3/2016 05:05 PM**		
Client ID:		Run ID: **TITRATOR 1_160603B**			SeqNo: **3859717**		Prep Date:		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
pH (laboratory)	4.27	0	4.4	0	97	90-110	0			

The following samples were analyzed in this batch: 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188895** Instrument ID **LACHAT2** Method: **E353.2 R2.0**

MBLK Sample ID: **MBLK-R188895** Units: **mg/L** Analysis Date: **6/3/2016 09:10 AM**
Client ID: Run ID: **LACHAT2_160603A** SeqNo: **3860032** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	U	0.020								

LCS Sample ID: **LCS-R188895** Units: **mg/L** Analysis Date: **6/3/2016 09:10 AM**
Client ID: Run ID: **LACHAT2_160603A** SeqNo: **3860033** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	4.81	0.020	5	0	96.2	90-110	0			

MS Sample ID: **1606087-01A MS** Units: **mg/L** Analysis Date: **6/3/2016 09:10 AM**
Client ID: Run ID: **LACHAT2_160603A** SeqNo: **3860037** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	5.024	0.020	5	0.01989	100	90-110	0			

MS Sample ID: **1606111-03B MS** Units: **mg/L** Analysis Date: **6/3/2016 09:10 AM**
Client ID: Run ID: **LACHAT2_160603A** SeqNo: **3860137** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	4.887	0.020	5	0.02617	97.2	90-110	0			

MSD Sample ID: **1606087-01A MSD** Units: **mg/L** Analysis Date: **6/3/2016 09:10 AM**
Client ID: Run ID: **LACHAT2_160603A** SeqNo: **3860038** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	5.029	0.020	5	0.01989	100	90-110	5.024	0.0995	20	

MSD Sample ID: **1606111-03B MSD** Units: **mg/L** Analysis Date: **6/3/2016 09:10 AM**
Client ID: Run ID: **LACHAT2_160603A** SeqNo: **3860138** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	4.88	0.020	5	0.02617	97.1	90-110	4.887	0.143	20	

The following samples were analyzed in this batch: 1606036-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188897** Instrument ID **LACHAT2** Method: **E353.2 R2.0**

MBLK Sample ID: **MBLK-R188897** Units: **mg/L** Analysis Date: **6/3/2016 09:10 AM**
Client ID: Run ID: **LACHAT2_160603B** SeqNo: **3860190** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	U	0.020								

LCS Sample ID: **LCS-R188897** Units: **mg/L** Analysis Date: **6/3/2016 09:10 AM**
Client ID: Run ID: **LACHAT2_160603B** SeqNo: **3860191** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	4.953	0.020	5	0	99.1	80-120	0			

MS Sample ID: **1606083-03D MS** Units: **mg/L** Analysis Date: **6/3/2016 09:10 AM**
Client ID: Run ID: **LACHAT2_160603B** SeqNo: **3860198** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	4.849	0.020	5	0.03009	96.4	75-125	0			

MSD Sample ID: **1606083-03D MSD** Units: **mg/L** Analysis Date: **6/3/2016 09:10 AM**
Client ID: Run ID: **LACHAT2_160603B** SeqNo: **3860199** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	4.847	0.020	5	0.03009	96.3	75-125	4.849	0.0413	20	

The following samples were analyzed in this batch: 1606036-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188898** Instrument ID **LACHAT2** Method: **E365.1 R2.0**

MBLK	Sample ID: **MBLK-R188898**				Units: **mg/L**			Analysis Date: **6/4/2016 09:59 AM**		
Client ID:	Run ID: **LACHAT2_160604A**			SeqNo: **3860211**	Prep Date:		DF: **1**			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	U	0.050								

LCS	Sample ID: **LCS-R188898**				Units: **mg/L**			Analysis Date: **6/4/2016 09:59 AM**		
Client ID:	Run ID: **LACHAT2_160604A**			SeqNo: **3860212**	Prep Date:		DF: **1**			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	0.9925	0.050	1	0	99.2	90-110	0			

MS	Sample ID: **1605414-08A MS**				Units: **mg/L**			Analysis Date: **6/4/2016 09:59 AM**		
Client ID:	Run ID: **LACHAT2_160604A**			SeqNo: **3860225**	Prep Date:		DF: **1**			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	1.049	0.050	1	0.005965	104	90-110	0			

MS	Sample ID: **1606035-01B MS**				Units: **mg/L**			Analysis Date: **6/4/2016 09:59 AM**		
Client ID:	Run ID: **LACHAT2_160604A**			SeqNo: **3860233**	Prep Date:		DF: **1**			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	1.569	0.050	1	0.4295	114	90-110	0			S

MSD	Sample ID: **1605414-08A MSD**				Units: **mg/L**			Analysis Date: **6/4/2016 09:59 AM**		
Client ID:	Run ID: **LACHAT2_160604A**			SeqNo: **3860226**	Prep Date:		DF: **1**			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	1.096	0.050	1	0.005965	109	90-110	1.049	4.38	20	

MSD	Sample ID: **1606035-01B MSD**				Units: **mg/L**			Analysis Date: **6/4/2016 09:59 AM**		
Client ID:	Run ID: **LACHAT2_160604A**			SeqNo: **3860234**	Prep Date:		DF: **1**			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	1.511	0.050	1	0.4295	108	90-110	1.569	3.77	20	

The following samples were analyzed in this batch: 1606036-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188902** Instrument ID **LACHAT2** Method: **A4500-P E-99**

MBLK Sample ID: **MBLK-R188902** Units: **mg/L** Analysis Date: **6/4/2016 11:54 AM**
Client ID: Run ID: **LACHAT2_160604C** SeqNo: **3860307** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	U	0.050								

LCS Sample ID: **LCS-R188902** Units: **mg/L** Analysis Date: **6/4/2016 11:54 AM**
Client ID: Run ID: **LACHAT2_160604C** SeqNo: **3860308** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	0.9614	0.050	1	0	96.1	90-110	0			

MS Sample ID: **1606036-02A MS** Units: **mg/L** Analysis Date: **6/4/2016 11:54 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT2_160604C** SeqNo: **3860310** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	0.9879	0.050	1	0.04236	94.6	90-110	0			H

MSD Sample ID: **1606036-02A MSD** Units: **mg/L** Analysis Date: **6/4/2016 11:54 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT2_160604C** SeqNo: **3860311** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Ortho-P (As P)	1.013	0.050	1	0.04236	97.1	90-110	0.9879	2.51	20	H

The following samples were analyzed in this batch: 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188905** Instrument ID **TOC2** Method: **A5310C-00**

MBLK Sample ID: **MBLK-R188905** Units: **mg/L** Analysis Date: **6/4/2016 12:32 PM**
Client ID: Run ID: **TOC2_160604A** SeqNo: **3860329** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	U	0.50								

LCS Sample ID: **LCS-R188905** Units: **mg/L** Analysis Date: **6/4/2016 12:32 PM**
Client ID: Run ID: **TOC2_160604A** SeqNo: **3860330** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	5.035	0.50	5	0	101	91-110	0			

MS Sample ID: **1606153-01A MS** Units: **mg/L** Analysis Date: **6/4/2016 12:32 PM**
Client ID: Run ID: **TOC2_160604A** SeqNo: **3860332** Prep Date: DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	23.47	2.0	20	1.746	109	87-120	0			

MSD Sample ID: **1606153-01A MSD** Units: **mg/L** Analysis Date: **6/4/2016 12:32 PM**
Client ID: Run ID: **TOC2_160604A** SeqNo: **3860333** Prep Date: DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Organic Carbon, Total	23.43	2.0	20	1.746	108	87-120	23.47	0.171	10	

The following samples were analyzed in this batch: 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188967** Instrument ID **LACHAT2** Method: **A4500-NH3 G-97**

MBLK Sample ID: **MBLK-R188967** Units: **mg NH3-N/L** Analysis Date: **6/6/2016 10:39 AM**
Client ID: Run ID: **LACHAT2_160606A** SeqNo: **3861667** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	U	0.020								

LCS Sample ID: **LCS-R188967** Units: **mg NH3-N/L** Analysis Date: **6/6/2016 10:39 AM**
Client ID: Run ID: **LACHAT2_160606A** SeqNo: **3861668** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	0.9675	0.020	1	0	96.8	80-120	0			

MS Sample ID: **1606012-02C MS** Units: **mg NH3-N/L** Analysis Date: **6/6/2016 10:39 AM**
Client ID: Run ID: **LACHAT2_160606A** SeqNo: **3861670** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	0.9781	0.020	1	0.03257	94.6	75-125	0			

MS Sample ID: **1606122-01A MS** Units: **mg NH3-N/L** Analysis Date: **6/6/2016 10:39 AM**
Client ID: Run ID: **LACHAT2_160606A** SeqNo: **3861685** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	0.9832	0.020	1	0.007067	97.6	75-125	0			

MSD Sample ID: **1606012-02C MSD** Units: **mg NH3-N/L** Analysis Date: **6/6/2016 10:39 AM**
Client ID: Run ID: **LACHAT2_160606A** SeqNo: **3861671** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	0.9763	0.020	1	0.03257	94.4	75-125	0.9781	0.184	25	

MSD Sample ID: **1606122-01A MSD** Units: **mg NH3-N/L** Analysis Date: **6/6/2016 10:39 AM**
Client ID: Run ID: **LACHAT2_160606A** SeqNo: **3861686** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Ammonia as Nitrogen	0.9851	0.020	1	0.007067	97.8	75-125	0.9832	0.193	25	

The following samples were analyzed in this batch: 1606036-01A 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R188973** Instrument ID **GALLERY** Method: **A4500-Cl E-97**

MBLK Sample ID: **WBLKW1-160606-R188973** Units: **mg/L** Analysis Date: **6/6/2016 11:50 AM**
Client ID: Run ID: **GALLERY_160606A** SeqNo: **3861858** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	U	1.0								

MS Sample ID: **1606107-01A MS** Units: **mg/L** Analysis Date: **6/6/2016 11:50 AM**
Client ID: Run ID: **GALLERY_160606A** SeqNo: **3861901** Prep Date: DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	193.8	4.0	50	154.7	78.1	75-125	0			

MSD Sample ID: **1606107-01A MSD** Units: **mg/L** Analysis Date: **6/6/2016 11:50 AM**
Client ID: Run ID: **GALLERY_160606A** SeqNo: **3861902** Prep Date: DF: **4**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	193.4	4.0	50	154.7	77.5	75-125	193.8	0.165	25	

LCS1 Sample ID: **WLCS1W1-160606-R188973** Units: **mg/L** Analysis Date: **6/6/2016 11:50 AM**
Client ID: Run ID: **GALLERY_160606A** SeqNo: **3861859** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	9.737	1.0	10	0	97.4	80-120	0			

LCS2 Sample ID: **WLCS2W1-160606-R188973** Units: **mg/L** Analysis Date: **6/6/2016 11:50 AM**
Client ID: Run ID: **GALLERY_160606A** SeqNo: **3861862** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	48.55	1.0	50	0	97.1	80-120	0			

The following samples were analyzed in this batch: 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R189038** Instrument ID **WETCHEM** Method: **E410.4 R2.0**

MBLK Sample ID: **CCB/MBLANK-R189038** Units: **mg/L** Analysis Date: **6/6/2016 02:15 PM**
Client ID: Run ID: **WETCHEM_160606P** SeqNo: **3863699** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	U	5.0								

LCS Sample ID: **CCV/LCS-R189038** Units: **mg/L** Analysis Date: **6/6/2016 02:15 PM**
Client ID: Run ID: **WETCHEM_160606P** SeqNo: **3863698** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	29.76	5.0	30	0	99.2	90-110	0			

MS Sample ID: **1606036-02A MS** Units: **mg/L** Analysis Date: **6/6/2016 02:15 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **WETCHEM_160606P** SeqNo: **3863761** Prep Date: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	13.9	10	30	0	46.3	90-110	0			S

MS Sample ID: **1606268-01B MS** Units: **mg/L** Analysis Date: **6/6/2016 02:15 PM**
Client ID: Run ID: **WETCHEM_160606P** SeqNo: **3863774** Prep Date: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	33.46	10	30	8.4	83.5	90-110	0			S

MSD Sample ID: **1606036-02A MSD** Units: **mg/L** Analysis Date: **6/6/2016 02:15 PM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **WETCHEM_160606P** SeqNo: **3863762** Prep Date: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	14.62	10	30	0	48.7	90-110	13.9	5.05	25	S

MSD Sample ID: **1606268-01B MSD** Units: **mg/L** Analysis Date: **6/6/2016 02:15 PM**
Client ID: Run ID: **WETCHEM_160606P** SeqNo: **3863775** Prep Date: DF: **2**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	32	10	30	8.4	78.7	90-110	33.46	4.46	25	S

The following samples were analyzed in this batch: 1606036-01A 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R189075** Instrument ID **LACHAT2** Method: **E353.2 R2.0**

MBLK Sample ID: **MBLK-R189075** Units: **mg/L** Analysis Date: **6/7/2016 10:25 AM**
Client ID: Run ID: **LACHAT2_160607A** SeqNo: **3864253** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	U	0.020								

LCS Sample ID: **LCS-R189075** Units: **mg/L** Analysis Date: **6/7/2016 10:25 AM**
Client ID: Run ID: **LACHAT2_160607A** SeqNo: **3864254** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	4.783	0.020	5	0	95.7	90-110	0			

MS Sample ID: **1606036-02A MS** Units: **mg/L** Analysis Date: **6/7/2016 10:25 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT2_160607A** SeqNo: **3864256** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	4.913	0.020	5	0.02509	97.8	90-110	0			

MS Sample ID: **1606327-01A MS** Units: **mg/L** Analysis Date: **6/7/2016 10:25 AM**
Client ID: Run ID: **LACHAT2_160607A** SeqNo: **3864272** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	7.119	0.020	5	2.242	97.5	90-110	0			

MSD Sample ID: **1606036-02A MSD** Units: **mg/L** Analysis Date: **6/7/2016 10:25 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT2_160607A** SeqNo: **3864257** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	4.9	0.020	5	0.02509	97.5	90-110	4.913	0.265	20	

MSD Sample ID: **1606327-01A MSD** Units: **mg/L** Analysis Date: **6/7/2016 10:25 AM**
Client ID: Run ID: **LACHAT2_160607A** SeqNo: **3864273** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate	7.125	0.020	5	2.242	97.7	90-110	7.119	0.0842	20	

The following samples were analyzed in this batch: 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R189076** Instrument ID **LACHAT2** Method: **E353.2 R2.0**

MBLK Sample ID: **MBLK-R189076** Units: **mg/L** Analysis Date: **6/7/2016 10:25 AM**
Client ID: Run ID: **LACHAT2_160607B** SeqNo: **3864356** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	U	0.020								

LCS Sample ID: **LCS-R189076** Units: **mg/L** Analysis Date: **6/7/2016 10:25 AM**
Client ID: Run ID: **LACHAT2_160607B** SeqNo: **3864357** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	5.277	0.020	5	0	106	80-120	0			

MS Sample ID: **1606036-02A MS** Units: **mg/L** Analysis Date: **6/7/2016 10:25 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT2_160607B** SeqNo: **3864289** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	4.901	0.020	5	0.01774	97.7	75-125	0			

MS Sample ID: **1606191-06A MS** Units: **mg/L** Analysis Date: **6/7/2016 10:25 AM**
Client ID: Run ID: **LACHAT2_160607B** SeqNo: **3864314** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	5.207	0.020	5	0.2336	99.5	75-125	0			

MSD Sample ID: **1606036-02A MSD** Units: **mg/L** Analysis Date: **6/7/2016 10:25 AM**
Client ID: **RCK001:50/50:SB16-1160-1** Run ID: **LACHAT2_160607B** SeqNo: **3864290** Prep Date: **6/3/2016** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	4.859	0.020	5	0.01774	96.8	75-125	4.901	0.861	20	

MSD Sample ID: **1606191-06A MSD** Units: **mg/L** Analysis Date: **6/7/2016 10:25 AM**
Client ID: Run ID: **LACHAT2_160607B** SeqNo: **3864315** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Nitrate-Nitrite	5.208	0.020	5	0.2336	99.5	75-125	5.207	0.0192	20	

The following samples were analyzed in this batch: 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Hull & Associates, Inc.
Work Order: 1606036
Project: RCK001

QC BATCH REPORT

Batch ID: **R189280** Instrument ID **LACHAT2** Method: **E365.1 R2.0**

MBLK Sample ID: **MBLK-R189280** Units: **mg/L** Analysis Date: **6/9/2016 01:39 PM**
Client ID: Run ID: **LACHAT2_160609E** SeqNo: **3868658** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	U	0.050								

LCS Sample ID: **LCS-R189280** Units: **mg/L** Analysis Date: **6/9/2016 01:39 PM**
Client ID: Run ID: **LACHAT2_160609E** SeqNo: **3868659** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	0.9377	0.050	1	0	93.8	90-110	0			

MS Sample ID: **1606270-01B MS** Units: **mg/L** Analysis Date: **6/9/2016 01:39 PM**
Client ID: Run ID: **LACHAT2_160609E** SeqNo: **3868676** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	1.601	0.050	1	0.5524	105	90-110	0			

MS Sample ID: **1606069-08A MS** Units: **mg/L** Analysis Date: **6/9/2016 01:39 PM**
Client ID: Run ID: **LACHAT2_160609E** SeqNo: **3868689** Prep Date: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	4.117	0.25	1	3.274	84.3	90-110	0			S

MSD Sample ID: **1606270-01B MSD** Units: **mg/L** Analysis Date: **6/9/2016 01:39 PM**
Client ID: Run ID: **LACHAT2_160609E** SeqNo: **3868677** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	1.551	0.050	1	0.5524	99.9	90-110	1.601	3.17	20	

MSD Sample ID: **1606069-08A MSD** Units: **mg/L** Analysis Date: **6/9/2016 01:39 PM**
Client ID: Run ID: **LACHAT2_160609E** SeqNo: **3868690** Prep Date: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total	4.024	0.25	1	3.274	75	90-110	4.117	2.3	20	S

The following samples were analyzed in this batch: 1606036-02A 1606036-03A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

1606036

~~1605989~~

HULL

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

NO. 0018

Dublin, OH	Indianapolis, IN	Mason, OH	Bedford, OH	Toledo, OH	St. Clairsville, OH	Pittsburgh, PA
6397 Emerald Pkwy	8445 Keystone Crossing	4770 Duke Dr.	4 Hemisphere Way	3401 Glendale Ave.	148 W. Main St.	Campbells Run Business Center
Suite 200	Suite 135	Suite 300	Bedford, OH 44146	Suite 300	2nd Floor	300 Business Center Dr., Suite 320
Dublin, OH 43016	Indianapolis, IN 46240	Mason, OH 45040	P: (440) 232-8945	Toledo, OH 43614	St. Clairsville, OH 43950	Pittsburgh, PA 15205
P: (614) 793-8777	P: (800) 241-7173	P: (513) 459-9677		P: (419) 385-2018	P: (800) 241-7173	P: (412) 446-0315

REPORT TO: Matt Bell

Client: Rocky Ridge Development

Site: Rocky Ridge

Project #: RCK001 Phase:

Samplers: J. Maniaci

Purchase Order #

SAMPLE MATRIX
AA-AMBIENT AIR
C-ASBESTOS
D-SEDIMENT
G-GROUNDWATER
IA-INDOOR AIR
L-LEACHATE
P-PRODUCT
S-SOIL
SG-SOIL GAS
SS-SUBSLAB VAPOR
W-WATER
X-CONCRETE

PRESERVATIVES
A-Cool only, <4 deg. C
B-HNO_3 pH<2
C-H_2SO_4 pH<2
D-NaOH pH>12
E-ZnAcetate + NaOH, pH>9
F-$Na_2S_2O_3$ (0.008%)
G-HCL pH <2
H-EDTA
I-5ml 1:1 HCL
J-none
K-Stored in dark
L-NH_4Cl
M-Methanol
S-Sodium

METALS
N - Not filtered
F45u- filtered with 0.45 micron
F5u- filtered with 5 micron

ANALYSES / PRESERVATIVES

	PROJECT NO.	SAMPLE LOCATION	SAMPLE MATRIX & ID	NO. OF CONT.	SAMPLE TYPE (discrete, composite)	COLLECTION DATE/TIME	METALS									COMMENTS
1	RCK001	50/50	S B16-1160	9	Composite	05/16/2016 / 13:30										
2	RCK001	66/33	S B16-1161	9	Composite	05/16/2016 / 13:00										
3	RCK001	33/66	S B16-1162	15	Composite	05/16/2016 / 13:30			✓							
						/										
						/										
						/										
						/										
						/										
						/										
						/										
						/										
						/										

(9)

RELINQUISHED BY:	DATE: 5/16/16	RECEIVED BY:	DATE: 5/17/16
	TIME: 4:00PM		TIME: 900
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:		TIME:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
	TIME:		TIME:

Deliver To: ALS

Method of Delivery: Fed Ex

Airbill Number:

Regulatory Program:

Required Limits:

COOLER TEMPERATURE AS RECEIVED 3.0 °C

DISTRIBUTION: WHITE -LAB USE (MUST BE RETURNED WITH REPORT)
YELLOW -LAB USE
PINK -RETAINED BY HULL

NOTES:

TURN AROUND TIME: _____ DAYS

Bill Carey

From: Matt Beil <mbeil@hullinc.com>
Sent: Wednesday, June 01, 2016 11:11 AM
To: Bill Carey; data admin
Subject: RE: 1605959 RCK001

Importance: High

Follow Up Flag: Follow up
Flag Status: Flagged

Please run SPLP on this sample for all analytes.

1605959-09 RCK001:33/66:SB16-1162-3 33/66 Soil 5/16/2016 13:30 5/17/2016 09:00

From: Bill Carey [mailto:Bill.Carey@ALSGlobal.com]
Sent: Thursday, May 26, 2016 12:08 PM
To: Matt Beil <mbeil@hullinc.com>; data admin <dataadmin@hullinc.com>
Subject: 1605959 RCK001

Matt - Results of the analyses for the samples we received on 5/17/16 are attached.

Hardcopies will not follow unless specifically requested.

Please contact us if we can be of any further assistance.

Regards – Bill

Bill Carey

Project Manager
ALS Life Sciences Division | Environmental

3352 128th Avenue
Holland, MI 49424 USA

D +1 616 738 7309
T +1 616 399 6070 X510
M +1 616 510 3267
F +1 616 399 6185

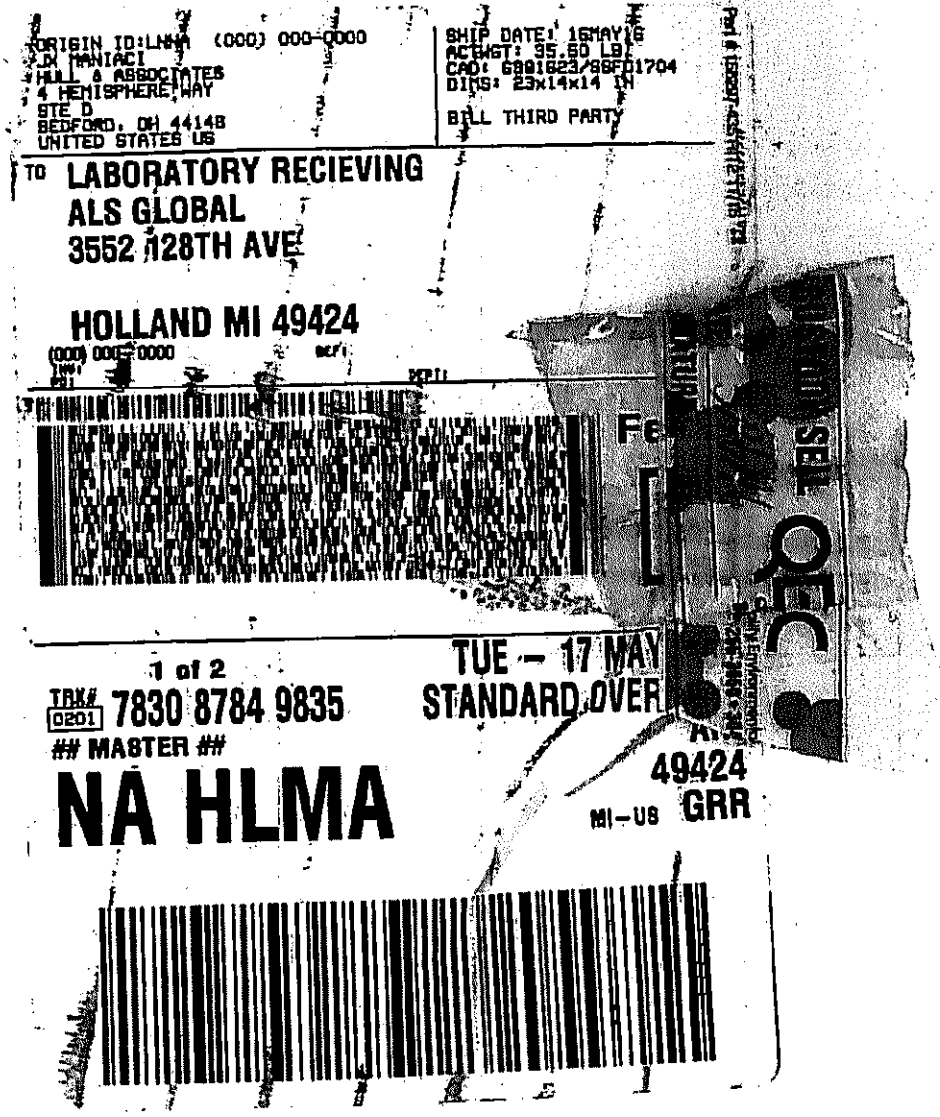
www.alsglobal.com

Table 3
Summary of Synthetic Precipitation Leaching Procedure (SPLP) Analyses for Lime/Soil Blends

SPLP Analysis for Blends[1]			
Chemical Sampling Parameter	**Lab Chemical Sampling Method**	**# of Samples**	**Applicable Target Standards**
pH (laboratory)	SW9040C	Lagoons - up to 3 composite samples per lagoon if totals results exceed MDL (up to 9 total lagoon SPLP samples) Blends - 33/66 Blend - up to 3 composite samples if totals results exceed MDL 50/50 Blend - up to 3 composite samples if totals results exceed MDL 66/33 Blend - up to 3 composite samples if totals results exceed MDL (up to 9 total blend SPLP samples)	OAC 3745-1 and 3745-2 Lake Erie Basin Aquatic Life and Human Health Tier I Criteria, Tier II Values and Screening Levels
Organic Carbon, Total	A5310C-00		
Chemical Oxygen Demand	E410.4 R2.0		
Biochemical Oxygen Demand	A5210B-01		
Chloride	A4500-Cl E-97		
Metals by ICP-MS SPLP/TCLP Na, Mg, K	SW6020A		
Nitrogen, Total Kjeldahl	A4500-NH3 G-97		
Nitrogen, Total	Calculation		
Nitrogen, Total Inorganic	Calculation		
Nitrogen, Total Organic	Calculation		
Nitrogen, Nitrite	A4500-NO2 B		
Nitrogen, Nitrate	E353.2 R2.0		
Nitrogen, Nitrate-Nitrite	E353.2 R2.0		
Ammonia as Nitrogen	A4500-NH3 G-97		
Phosphorus, Total	E365.1 R2.0		
Phosphorus, Ortho-P (As P)	A4500-P E-99		
Volatile Organic Compounds - Aqueous	SW8260B		
SPLP/TCLP Priority Pollutant VOCs			
Semi-Volatile Organic Compounds	SW8270C		
SPLP/TCLP Priority Pollutant SVOCs			
PCBs	SW8082		
SPLP/TCLP			
Pesticides	SW8081A		
SPLP/TCLP Priority Pollutant Pesticides			
Cyanide, Total	SW9012B		
SPLP/TCLP			
Metals by ICP-MS	SW6020A		
SPLP/TCLP Priority Pollutant Metals			
Mercury by CVAA	SW7470A		
SPLP Leach for Wet Chemistry	SW1311		
SPLP Leach for Metals	SW1311		
SPLP Leach for Volatiles	SW1311		
SPLP Leach for Semi-Volatiles	SW1311		

Notes

1. SPLP analysis will only be completed if a total result for that parameter exceeds the Method Detection Limit (MDL). Analytes that are non-detect will not be run for SPLP.
2. Rocky Ridge will be responsible for all data collection, field reports and general documentation of field activities during the lime characterization.



ORIGIN ID:LNHA (000) 000-0000
JON MANIACI
HULL & ASSOCIATES
4 HEMISPHERE WAY
STE D
BEDFORD, OH 44146
UNITED STATES US

SHIP DATE: 16MAY16
ACTWGT: 35.60 LB
CAD: 6881623/SSFE1704
DIMS: 23x14x14 IN
BILL THIRD PARTY

TO LABORATORY RECIEVING
ALS GLOBAL
3552 128TH AVE

HOLLAND MI 49424

(000) 000-0000

1 of 2

TRK# 0201 7830 8784 9835

TUE - 17 MAY
STANDARD OVER

MASTER

NA HLMA

49424
MI-US GRR

Bill Carey

From: Matt Beil <mbeil@hullinc.com>
Sent: Thursday, June 02, 2016 11:42 AM
To: Bill Carey
Subject: RE: 1606036 RCK001

Importance: High

Please also run SPLP on the following samples:

1605959-01 RCK001:50/50:SB16-1160-1
1605959-07 RCK001:66/33:SB16-1161-3

Thanks,

J Matthew Beil, CPG
Project Manager

HULL | Toledo, Ohio
ALTERNATIVE ENERGY | BROWNFIELDS | ENVIRONMENTAL | SHALE OIL & GAS | WASTE MANAGEMENT
p: 419.385.2018 | f: 419.385.5487 | c: 419.283.3664
web | directions to offices

From: Bill Carey [mailto:Bill.Carey@ALSGlobal.com]
Sent: Wednesday, June 01, 2016 3:25 PM
To: Matt Beil <mbeil@hullinc.com>
Subject: 1606036 RCK001

Matt - A project summary for the samples we received is attached. Unless notified otherwise, we will proceed as indicated.

Please contact us if we can be of any further assistance.

Regards – Bill

Bill Carey

Project Manager
ALS Life Sciences Division | Environmental

ALS Group USA, Corp

Sample Receipt Checklist

Client Name: **HULL&ASSOC-TOLEDO** Date/Time Received: **01-Jun-16 00:00**

Work Order: **1606036** Received by: **MEB**

Checklist completed by Meghan Broadbent eSignature 01-Jun-16 Date Reviewed by: Bill Carey eSignature 01-Jun-16 Date

Matrices: soil

Carrier name: FedEx

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☐	No ☑	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.6/3.6	SR2	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	6/1/2016 2:23:37 PM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes: Samples stored in cooler

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction:

APPENDIX C

Summary of Geotechnical Laboratory Testing Results Memorandum

Memorandum

TO: Scott Stansley (Rocky Ridge Development, LLC)

FROM: Shawn McGee, P.E. and Jeff Henfling, P.E.

DATE: June 7, 2016

RE: Summary of Geotechnical Laboratory Testing Results for the Rocky Ridge Quarry in Graytown, Ottawa County, Ohio; RCK001.100.0015.

Hull & Associates, Inc. (Hull) is pleased to provide Rocky Ridge Development, LLC (Rocky Ridge) the results of the geotechnical laboratory testing of proposed materials to be used during the spent lime beneficial use project at the Rocky Ridge Quarry located at 14591 W. Toussaint North in Graytown, Ottawa County, Ohio (Site). The purpose of the geotechnical laboratory testing was to obtain a better understanding of the relevant engineering properties of the proposed embankment fill materials and provide geotechnical information to support construction (earthwork) planning and design considerations. A geotechnical engineer has planned and supervised the performance of the geotechnical engineering services, considered the findings, and prepared this summary report in accordance with industry accepted geotechnical engineering practices.

BACKGROUND

The Rocky Ridge Quarry (Site) has current plans to receive, mix, and embank a soil-lime blended material at the Site. Lime will be transported from the Toledo Wastewater Treatment Plant to the Site, where it is planned to be mixed by volume with conventional construction equipment, and placed on-Site in accordance with Phasing Plans prepared by Hull in 2015 and applicable Ohio EPA approvals. On-Site (native) soils will be utilized with the imported lime to create the blended embankment material. In order to ensure proper placement of embankment, samples of the native soils and samples of lime were collected by Rocky Ridge and provided to Hull for geotechnical laboratory testing. Additionally, environmental testing of these materials was performed and are being presented under a separate cover. The results of the laboratory-based analysis were used to establish proposed construction methods (e.g., optimal blends for the lime and soil blend, lift thicknesses, material preparation for placement and compactability, etc.) to be followed during placement of the material at the Site.

GEOTECHNICAL LABORATORY TESTING APPROACH

Hull received samples collected by Rocky Ridge, which included buckets of native soils from four (4) locations (i.e., Sample Locations 1, 2, 3A, and 4), as well as buckets of lime. Moisture content as-received by the laboratory (ASTM D2216), liquid and plastic limits (Atterbergs, ASTM D4318), and grain-size analysis (ASTM D422, AASHTO T88) was performed on each native soil sample to classify them according to the United Soils Classification System (USCS). Select native soils and lime was mixed/blended in the laboratory based on a volumetric method to simulate construction methods, and tested for the Standard Proctor Method (ASTM D698), Specific Gravity (ASTM D854), and Flexible Wall Permeability (ASTM D5084).

Index Testing (Grain Size Distribution and Atterberg Limits) Results

The four native on-Site soil samples tested can be described as a lean clay with sand or a lean clay and classified with the USCS group symbol of "CL". Table 1 provides a summary of the grain-size distribution results.

Table 1 – USCS Classification Test Results

Sample Location	Hull Lab #	USCS Classification (USCS Group Symbol)	Moisture Content (%)	Percent Gravel (%)	Percent Sand (%)	Percent Silt (%)	Percent Clay (5mm) (%)
1	B16-1040	Lean CLAY with Sand (CL)	16.6	1.3	16.8	29.2	52.7
2	B16-1041	Lean CLAY with Sand (CL)	18.3	2.0	21.0	29.7	47.3
3A	B16-1043	Lean CLAY (CL)	24.1	0.7	7.3	31.7	60.2
4	B16-1042	Lean CLAY with sand (CL)	14.1	2.8	19.5	31.0	46.7

The liquid limits ranged from 30 to 48 with the plasticity indices ranging from 14 to 26. Table 2 provides the results of the Atterberg limits.

Table 2 – Atterberg Limits Test Results

Sample Location	Lab ID	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)
1	B16-1040	37	19	18
2	B16-1041	33	17	16
3A	B16-1043	48	22	26
4	B16-1042	30	16	14

Grain Size Distribution Reports and Atterberg results are provide in Attachment A.

Standard Proctor Testing Results

Based on the similarity of the grain size distribution and plasticity characteristics, one native sample location was used in the blending phase of the laboratory testing. As a conservative approach, sample location 2 was selected due to the material having the least amount of percentage of clay and lowest range of moisture content in which the material exhibits plasticity characteristics (i.e., lowest plasticity index value), suggesting the material will have the highest hydraulic conductivity/permeability. Based on the chemical results of the lime material, lime from Sample E-2 was utilized in the blends. It was important to use material from a single source for all sample blends so the test results would have a single independent variable (i.e., blend ratio) and test results would not be skewed.

The following three soil/lime blends were selected for the testing program:

- 50% Native Soil and 50% Lime
- 67% Native Soil and 33% Lime
- 33% Native Soil and 67% Lime

In order to best replicate the mixing technique in the field, the native soils and lime were blended by bulk volume (not drying the material out). The samples were prepared and dry prepped for subsequent Proctor testing following blending of the soil and lime to ensure the proper blending ratios were achieved. The results of the Standard Proctor Testing of the three blends is shown in Table 3.

Table 3 – Standard Proctor Test Results

Blend*	Lab ID	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Specific Gravity
50% On-Site Soil and 50% Lime	B16-1160	105.7	18.8	2.70
67% On-Site Soil and 33% Lime	B16-1161	108.5	17.2	2.75
33% On-Site Soil and 67% Lime	B16-1162	103.7	19.8	2.70

* Native Soil was taken from Sample Location 1 and Lime was from Sample E-2.

As expected, the maximum dry density decreased, with an increasing percentage of lime. The optimum moisture content of the blended material was also relatively consistent – the higher the maximum dry density, the lower the optimum moisture content. Also, there was a slight increase in the specific gravity with a higher percentage of soil (i.e., 67% soil as compared to the 33% and 50% soil blends). As previously mentioned, the blends were mixed by volume, not by weight, and thus should be comparable to how the material will be handled and blended by construction equipment on-Site (i.e., with an excavator bucket).

Copies of the laboratory test results for the Standard Proctor testing are provided in Attachment B.

The grain-size analysis and Standard Proctor testing was completed at Hull's AASHTO-accredited geotechnical/materials testing laboratory. The permeability testing was completed by Geotechnical Testing Services, Inc. of Coraopolis, Pennsylvania - a third party, commercial testing laboratory also accredited by AASHTO. Soil samples will be stored at our geotechnical/materials testing laboratory for 90 days from the date of this report unless otherwise directed by you.

Flexible Wall Permeability Testing

Hydraulic conductivity measurements using a flexible wall permeameter (ASTM D5084) was completed to evaluate the permeability of the various blends of native soil and lime as discussed above. The blended samples were remolded at 95% of the maximum dry density and 2% above optimum moisture content as determined by the moisture-density relationships per the Standard Proctor testing results as previously discussed. The permeability results were relatively similar between the three blends and ranged between 6.4×10^{-6} and 1.1×10^{-5} cm/sec. Based on the testing results, there does not appear to be a correlation between the permeability and the amount of soil/lime in the blend.

Table 4 – Permeability Test Results

Blend*	Lab ID	Hydraulic Conductivity (cm/sec)
50% On-Site Soil and 50% Lime	B16-1160	1.1×10^{-5}
67% On-Site Soil and 33% Lime	B16-1161	6.4×10^{-6}
33% On-Site Soil and 67% Lime	B16-1162	7.2×10^{-6}

* Native Soil was taken from Sample Location 1 and Lime was from Sample E-2.

The permeability test reports are provided in Attachment C.

All phases of the geotechnical laboratory-testing program was conducted in general accordance with applicable *American Society for Testing and Materials* (ASTM) and *American Association of State Highway and Transportation Officials (*AASHTO) specifications and Hull's Standard Operating Procedures.

SUMMARY

Based on the results of the laboratory testing, it appears the blended materials are suitable for its intended use as embankment material as a screening berm and to fill the quarry at the Site. The native soil is a lean clay and a lean clay with sand (CL) of moderate plasticity. Once mixed with the lime, the blended material at all three blends appear to be a compactable material with relatively low permeability. Therefore, the blended material at all three blends can be considered suitable for use in the beneficial use application at the Site.

CLOSING REMARKS

The evaluations, conclusions, and recommendations presented in this memorandum are based on information disclosed by the limited number of sampling locations and samples tested, our interpretation of the field and laboratory data obtained during the exploration, and our understanding of the project. The information obtained from the individual sampling locations are representative of the material conditions at the specific sampling locations at the time of sampling, and must be extrapolated to get an understanding of the material conditions between the sampling locations. This extrapolation is based on the limited knowledge of the facility operations and processes and on past experience. Therefore, the recommendations and observations presented in this Report are based in part on the assumption that material conditions encountered will not be altered during construction. Consequently, it is recommended that Hull perform the construction observation and testing to make certain the intent of our recommendations as presented in this Report is being followed and to make real-time changes to our recommendations in the event that site conditions vary from those observed from the laboratory testing. The recommendations in this Report are considered final only if Hull observes the excavation, material blending, and other earthwork activities to determine if actual conditions differ from those encountered during the explorations.

Furthermore, any revision in the plans for the proposed Site from those enumerated in this Report should be brought to the attention of Hull so it may be determined if changes in the earthwork recommendations are required. If additional data are needed for design purposes or if deviations from the noted subsurface conditions are encountered during construction, they should all be brought immediately to the attention of Hull. At that time, it may be necessary for Hull to submit modified or supplementary recommendations, if needed.

STANDARD OF CARE AND LIMITATIONS

The observations presented herein are based on the level of effort and investigative techniques using that degree of care and skill ordinarily exercised under similar conditions by reputable members of the profession practicing in the same or similar locality at the time of service. No other warranties, expressed or implied, are made or intended by this report. An evaluation of past or present compliance with federal, state, or local environmental or land use laws or regulations has not been conducted. Conclusions presented by Hull regarding the Site are consistent with the level of effort specified and investigative techniques employed. Reports, opinions, letters, and other documents do not evaluate the presence or absence of any compound or parameter not specifically analyzed and reported. Hull makes no guarantees regarding the completeness or accuracy of any information obtained from public or private files or information provided by subcontractors. In addition, Hull makes no guarantees on the conditions of the Site or changes in Site records after the date reviewed as indicated in the report.

Furthermore, this letter-report is prepared and made available for the sole use of Rocky Ridge Development, LLC and their assigns for the specific purposes mentioned above. The contents thereof may not be used or relied upon by any other person or entity, without the express written consent and authorization of Rocky Ridge Development, LLC and Hull.

If you have any questions or comments, please feel free to contact Shawn McGee at (440) 232-9945 at your first opportunity.

cc: William G. Petruzzi, P.G., Hull & Associates, Inc. (w/attachments)
Matt Beil, Hull & Associates, Inc. (w/attachments)

ATTACHMENT A

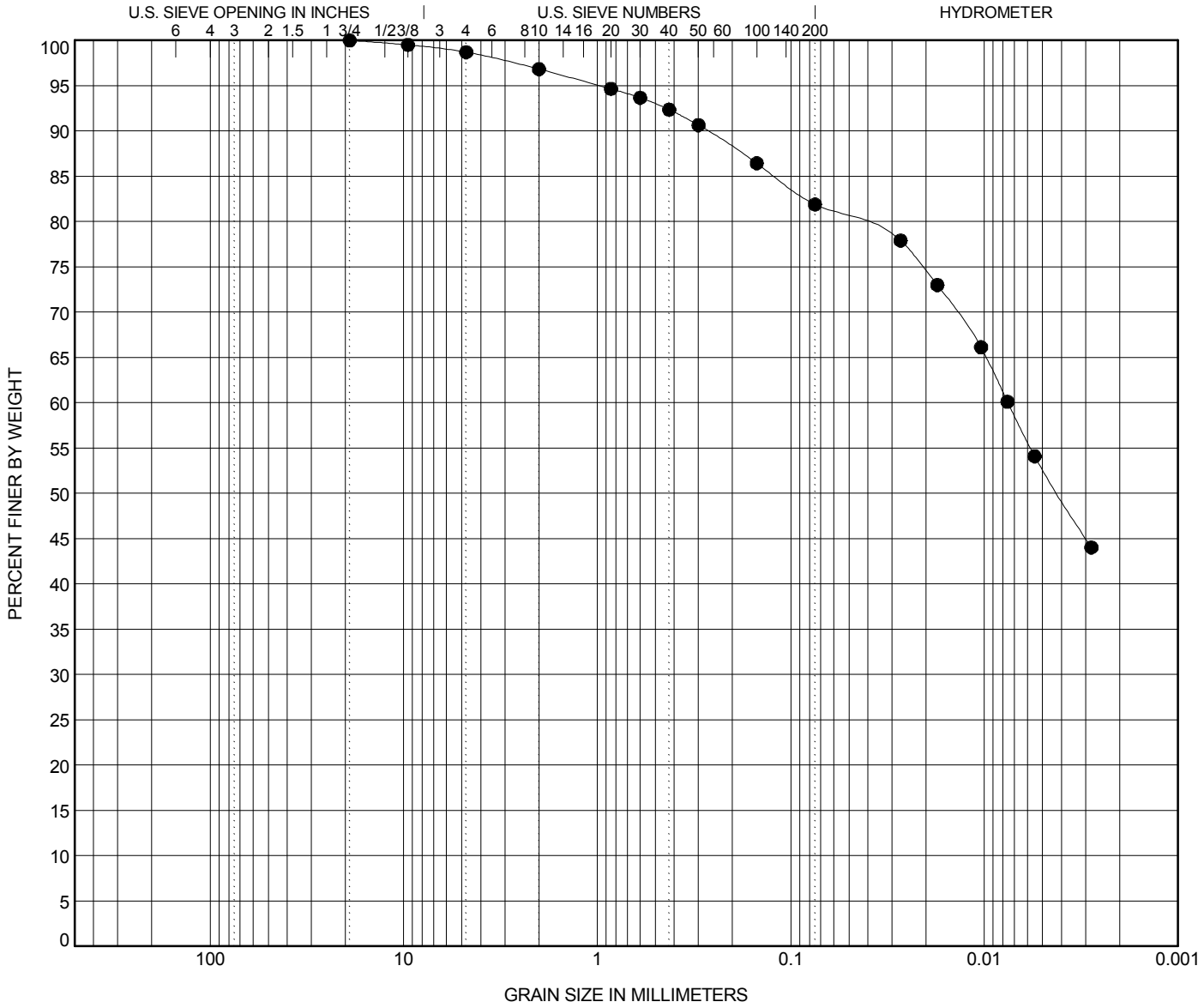
Geotechnical Laboratory Reports
(Grain Size Analysis of Native Soils)

Hull & Associates, Inc.
4 Hemishpere Way
Bedford, Ohio 44146
Telephone (440) 232-9945
Fax (440) 232-9946

GRAIN SIZE DISTRIBUTION

CLIENT Rocky Ridge Development **PROJECT NAME** Rocky Ridge

PROJECT NUMBER RCK001 **PROJECT LOCATION**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	LAB ID	COLOR	USCS Classification	MC	LL	PL	PI	Cc	Cu
● 1	0.0-5.0	B16-1040	Brown	LEAN CLAY with SAND(CL)	16.6%	37	19	18		

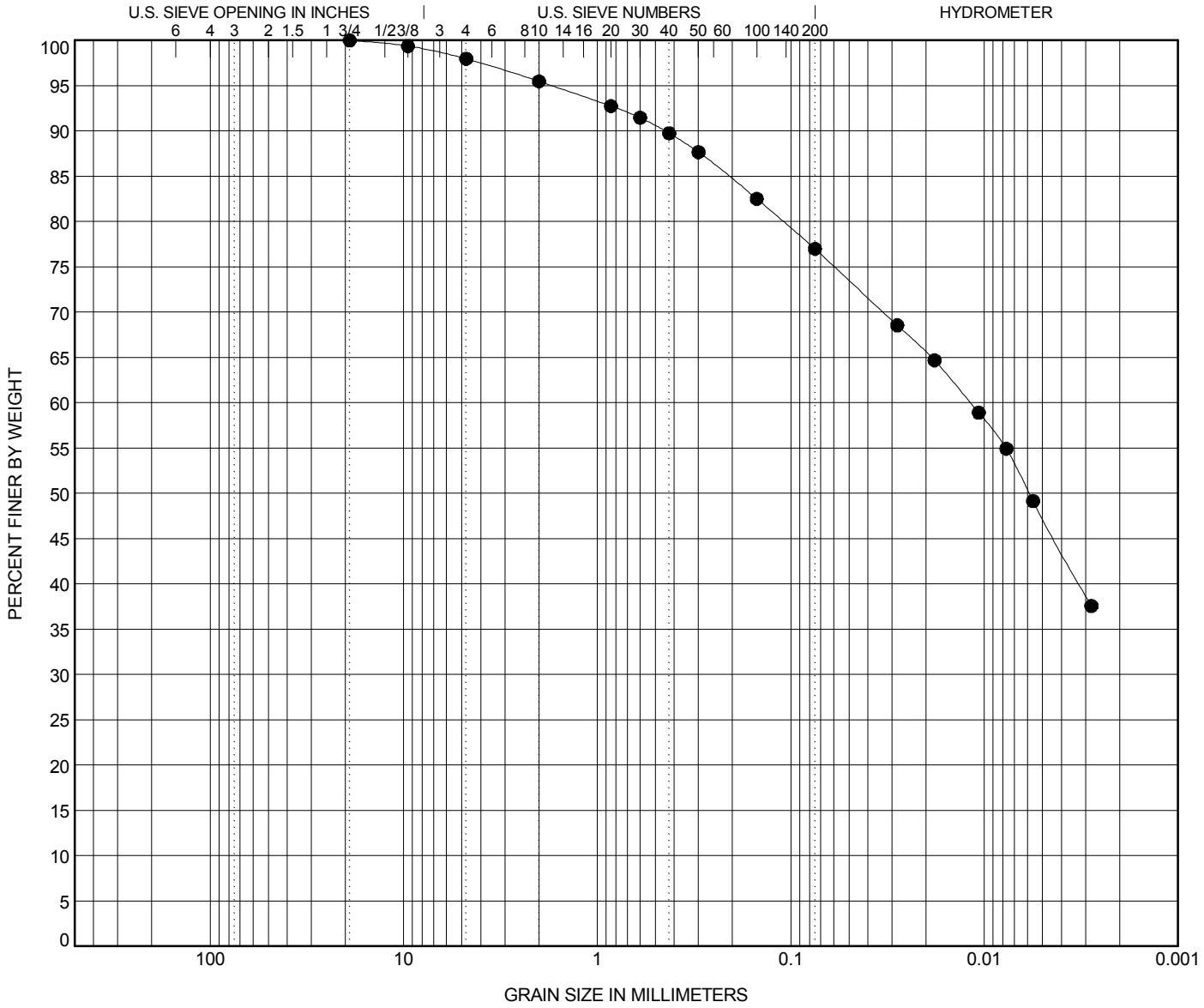
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 1	0.0-5.0	19	0.008			1.3	16.8	29.2	52.7

Hull & Associates, Inc.
4 Hemishpere Way
Bedford, Ohio 44146
Telephone (440) 232-9945
Fax (440) 232-9946

GRAIN SIZE DISTRIBUTION

CLIENT Rocky Ridge Development **PROJECT NAME** Rocky Ridge

PROJECT NUMBER RCK001 **PROJECT LOCATION**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	LAB ID	COLOR	USCS Classification	MC	LL	PL	PI	Cc	Cu
● 2	4.0-18.0	B16-1041	Brown	LEAN CLAY with SAND(CL)	18.3%	33	17	16		

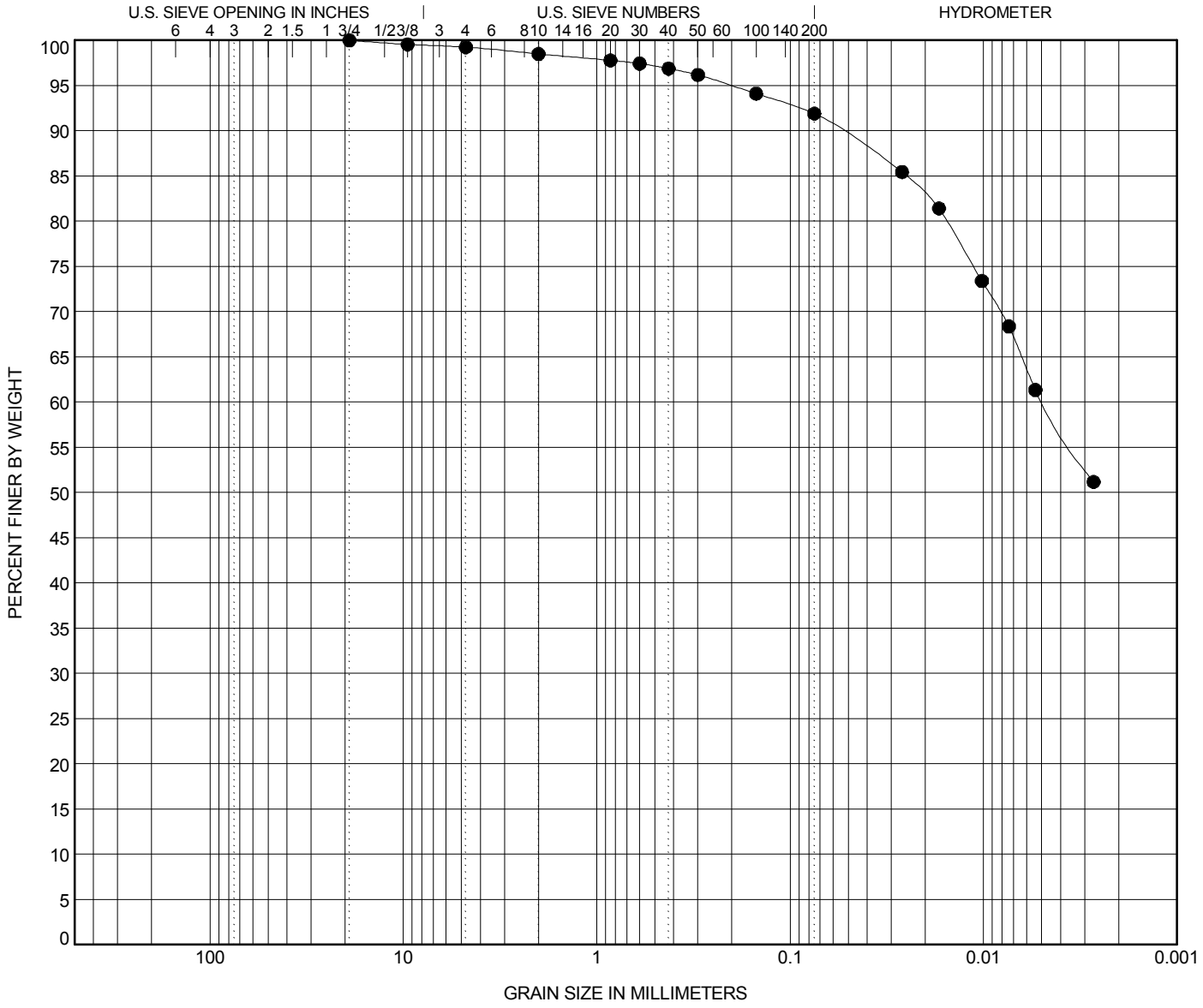
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 2	4.0-18.0	19	0.012			2.0	21.0	29.7	47.3

Hull & Associates, Inc.
4 Hemishpere Way
Bedford, Ohio 44146
Telephone (440) 232-9945
Fax (440) 232-9946

GRAIN SIZE DISTRIBUTION

CLIENT Rocky Ridge Development **PROJECT NAME** Rocky Ridge

PROJECT NUMBER RCK001 **PROJECT LOCATION**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	LAB ID	COLOR	USCS Classification	MC	LL	PL	PI	Cc	Cu
● 3 - Brown (A)	0.0-12.0	B16-1043	Brown	LEAN CLAY(CL)	24.1%	48	22	26		

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 3 - Brown (A)	0.0-12.0	19	0.005			0.7	7.3	31.7	60.2

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4 Hemishpere Way
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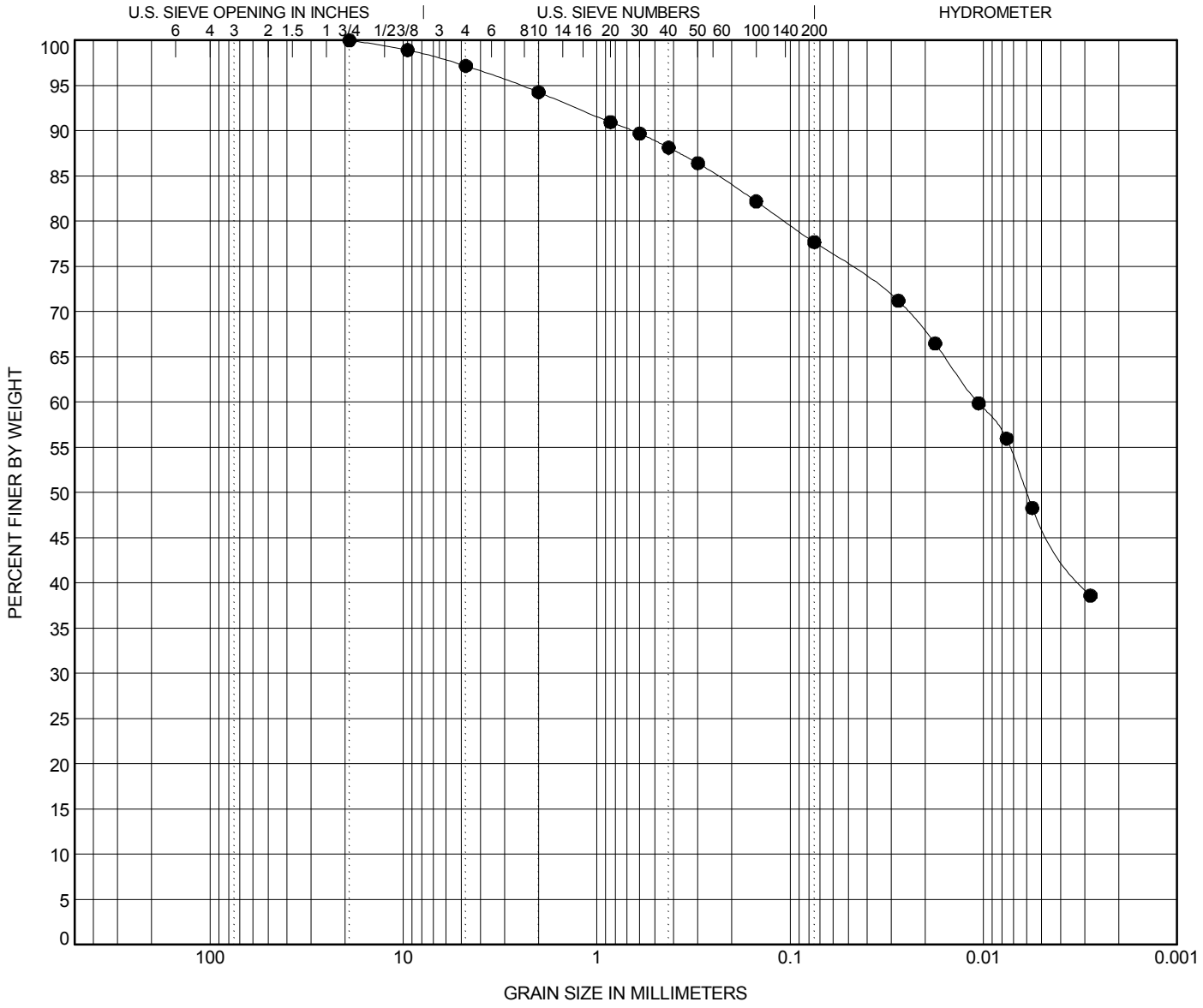
Telephone (440) 232-9945
Fax (440) 232-9946

GRAIN SIZE DISTRIBUTION

CLIENT Rocky Ridge Development **PROJECT NAME** Rocky Ridge

PROJECT NUMBER RCK001 **PROJECT LOCATION**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	LAB ID	COLOR	USCS Classification	MC	LL	PL	PI	Cc	Cu
● 4	0.0-8.0	B16-1042	Gray	LEAN CLAY with SAND(CL)	14.1%	30	16	14		

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 4	0.0-8.0	19	0.011			2.8	19.5	31.0	46.7

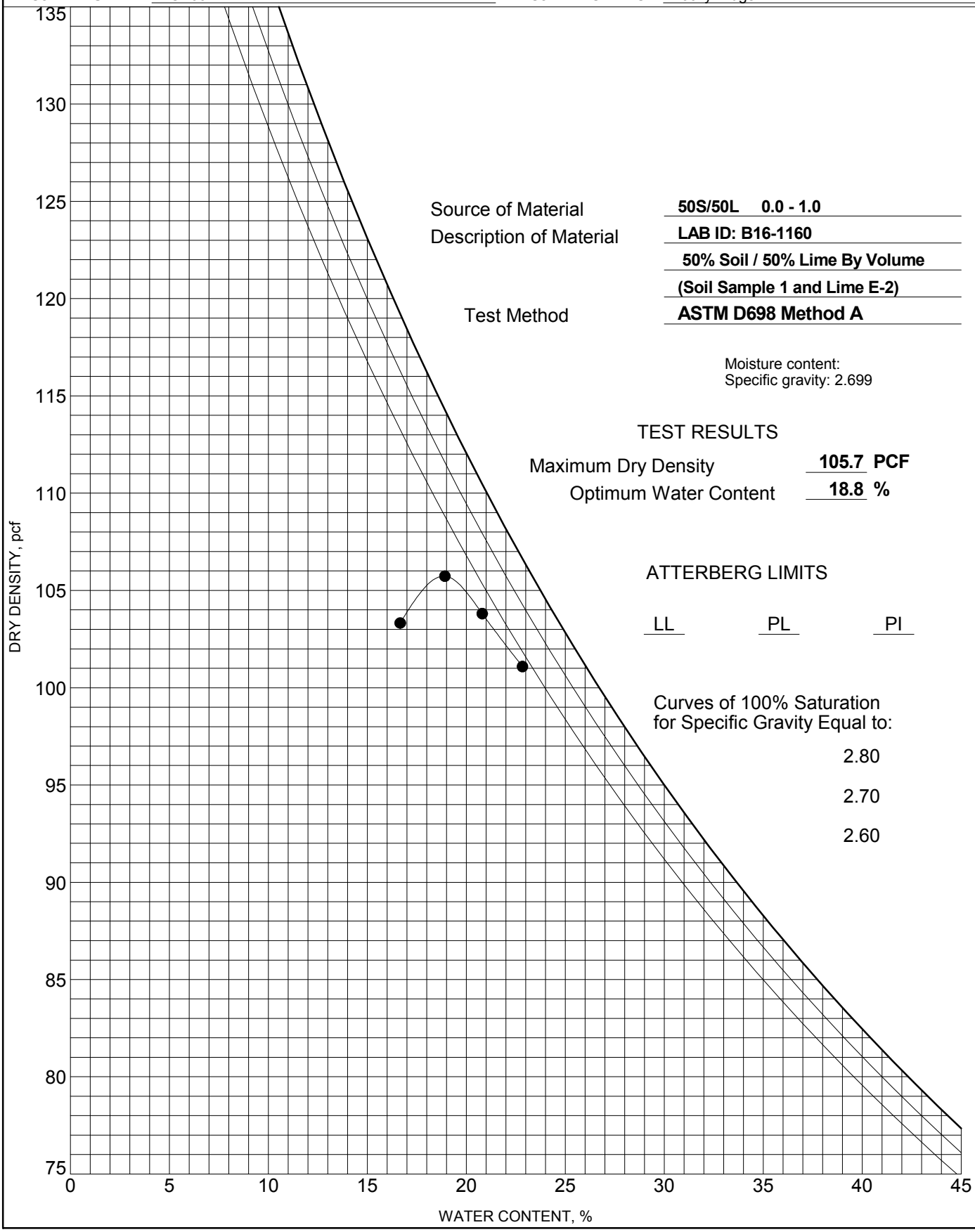
ATTACHMENT B

Geotechnical Laboratory Reports
(Standard Proctor Test Results of Blended Material)

Hull & Associates, Inc.
4 Hemishpere Way
Bedford, Ohio 44146
Telephone (440) 232-9945
Fax (440) 232-9946

MOISTURE-DENSITY RELATIONSHIP

CLIENT Rocky Ridge Development
PROJECT NAME Material Blending
PROJECT NUMBER RCK001
PROJECT LOCATION Rocky Ridge



Source of Material: **50S/50L 0.0 - 1.0**
Description of Material: **LAB ID: B16-1160**
50% Soil / 50% Lime By Volume
(Soil Sample 1 and Lime E-2)
Test Method: **ASTM D698 Method A**

Moisture content:
Specific gravity: 2.699

TEST RESULTS

Maximum Dry Density **105.7** **PCF**
Optimum Water Content **18.8** **%**

ATTERBERG LIMITS

LL PL PI

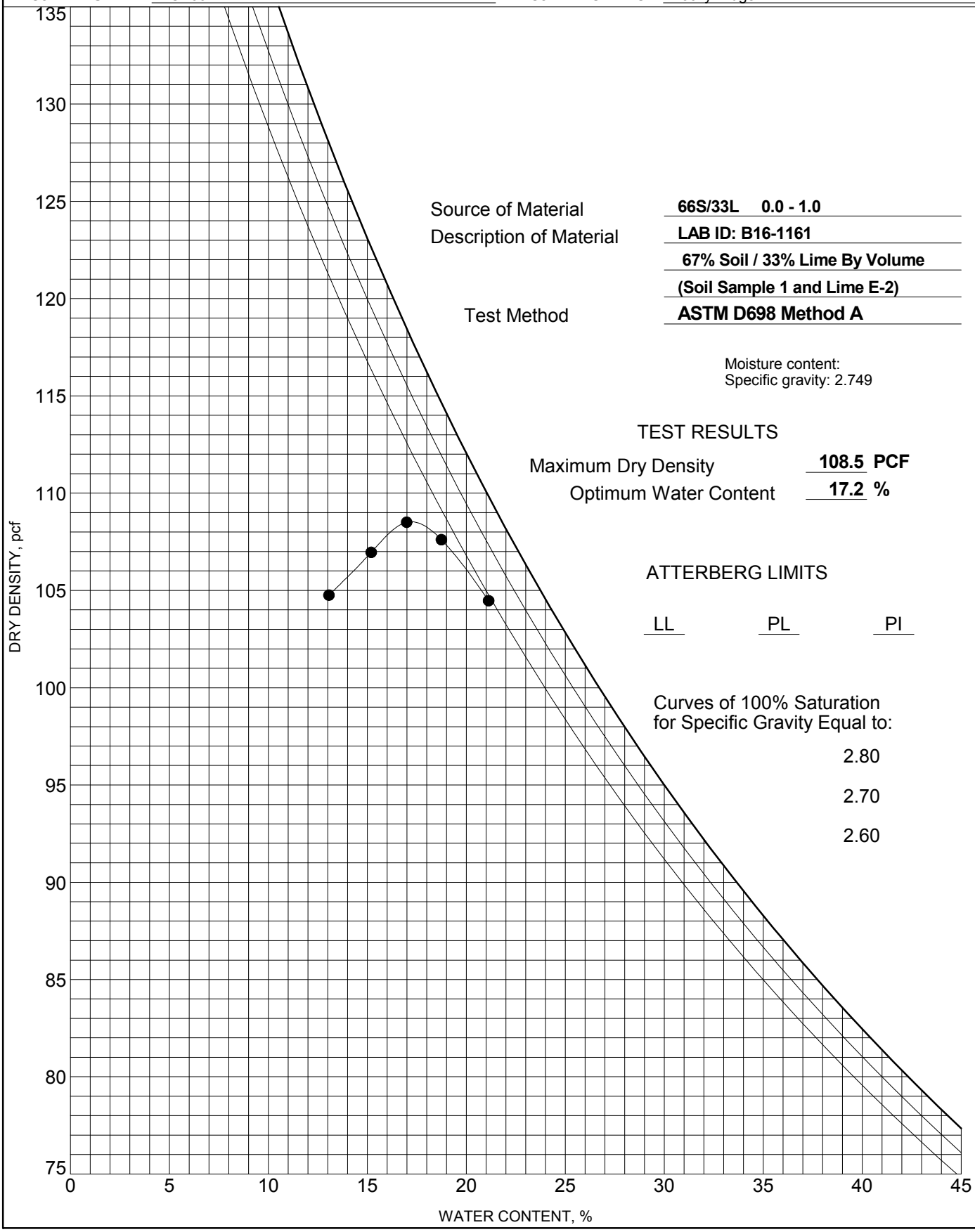
Curves of 100% Saturation for Specific Gravity Equal to:

2.80
2.70
2.60

Hull & Associates, Inc.
4 Hemishpere Way
Bedford, Ohio 44146
Telephone (440) 232-9945
Fax (440) 232-9946

MOISTURE-DENSITY RELATIONSHIP

CLIENT Rocky Ridge Development
PROJECT NAME Material Blending
PROJECT NUMBER RCK001
PROJECT LOCATION Rocky Ridge



Source of Material: **66S/33L 0.0 - 1.0**
Description of Material: **LAB ID: B16-1161**
67% Soil / 33% Lime By Volume
(Soil Sample 1 and Lime E-2)
Test Method: **ASTM D698 Method A**

Moisture content:
Specific gravity: 2.749

TEST RESULTS

Maximum Dry Density **108.5** **PCF**
Optimum Water Content **17.2** **%**

ATTERBERG LIMITS

LL	PL	PI

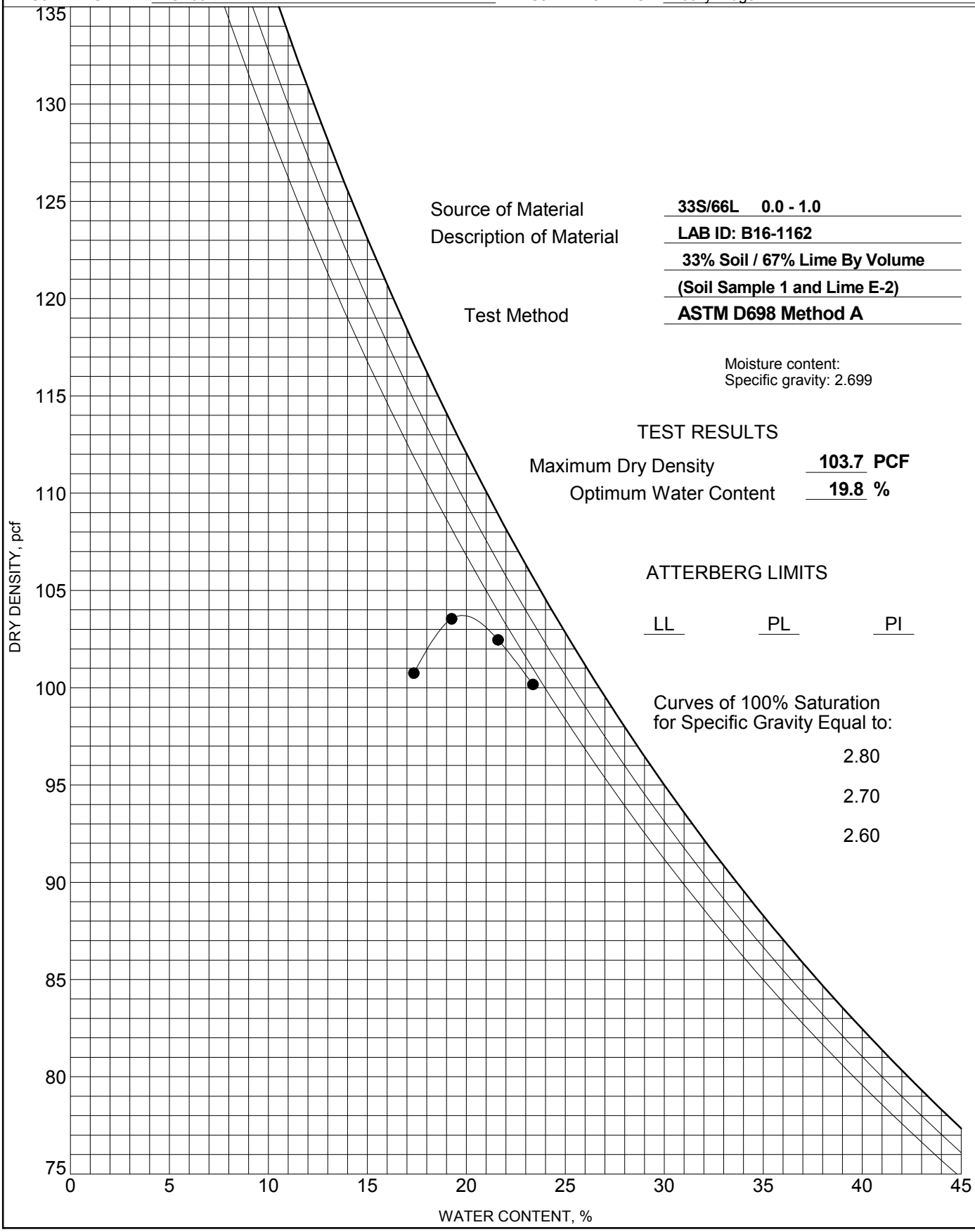
Curves of 100% Saturation for Specific Gravity Equal to:

2.80
2.70
2.60

Hull & Associates, Inc.
4 Hemishpere Way
Bedford, Ohio 44146
Telephone (440) 232-9945
Fax (440) 232-9946

MOISTURE-DENSITY RELATIONSHIP

CLIENT Rocky Ridge Development
PROJECT NAME Material Blending
PROJECT NUMBER RCK001
PROJECT LOCATION Rocky Ridge



Source of Material: **33S/66L 0.0 - 1.0**
Description of Material: **LAB ID: B16-1162**
33% Soil / 67% Lime By Volume
(Soil Sample 1 and Lime E-2)
Test Method: **ASTM D698 Method A**

Moisture content:
Specific gravity: 2.699

TEST RESULTS

Maximum Dry Density **103.7** **PCF**
Optimum Water Content **19.8** **%**

ATTERBERG LIMITS

LL	PL	PI

Curves of 100% Saturation for Specific Gravity Equal to:

2.80
2.70
2.60

COMPACTION - GINT STD US LAB 2014.GDT - 6/10/16 09:19 - F:\CLIENTS\ACTIVE\GINT\PROJECTS\RCK001.GPJ

ATTACHMENT C

Geotechnical Laboratory Reports
(Permeability Test Results of Blended Material)

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER

ASTM D5084-00 Method F; Mercury U-Tube Permometer - Inflow Volume = Outflow Volume

Client	Hull & Associates, Inc.	Boring	NA
Client Project	Rocky Ridge Development	Depth	NA
Project No.	37424	Sample	B16-1160
Visual Description	50% Soil/ 50% Lime	Lab Sample No.	37424001
Sample Condition	Remolded		

SAMPLE CONDITIONS		
Sample Status	Initial	Final
Tare Number	B08	101
Wt. Tare & WS, gm	178.8	719.48
Wt. Tare & DS, gm	162.45	588.44
Wt. Tare, gm	83.6	83.09
Moisture Content, %	20.7%	25.9%
Wt. Tube & WS., gm	615.6	NA
Wt. Of Tube, gm	0	NA
Wt. Of WS., gm	615.6	642.1
Length 1, in	3	3.045
Length 2, in	3	3.039
Length 3, in	3	3.052
Top Diameter, in	2.864	2.894
Middle Diameter, in	2.865	2.875
Bottom Diameter, in	2.8655	2.872
Average Length, **L**, cm	7.62	7.74
Average Area, **A**, cm^2	41.59	42.04
Sample Volume, cc	316.9	325.2
Unit Wet Wt., gm/cc	1.94	1.97
Unit Wet Wt., pcf	121.2	123.2
Unit Dry Wt., pcf	100.4	97.8
Unit Dry Wt., gm/cc	1.61	1.57
Specific Gravity, Assumed	2.7	2.7
Void Ratio, e	0.678	0.722
Porosity, n	0.404	0.419
Pore Volume, cc	128.05	136.33
Saturation, %	82.6%	

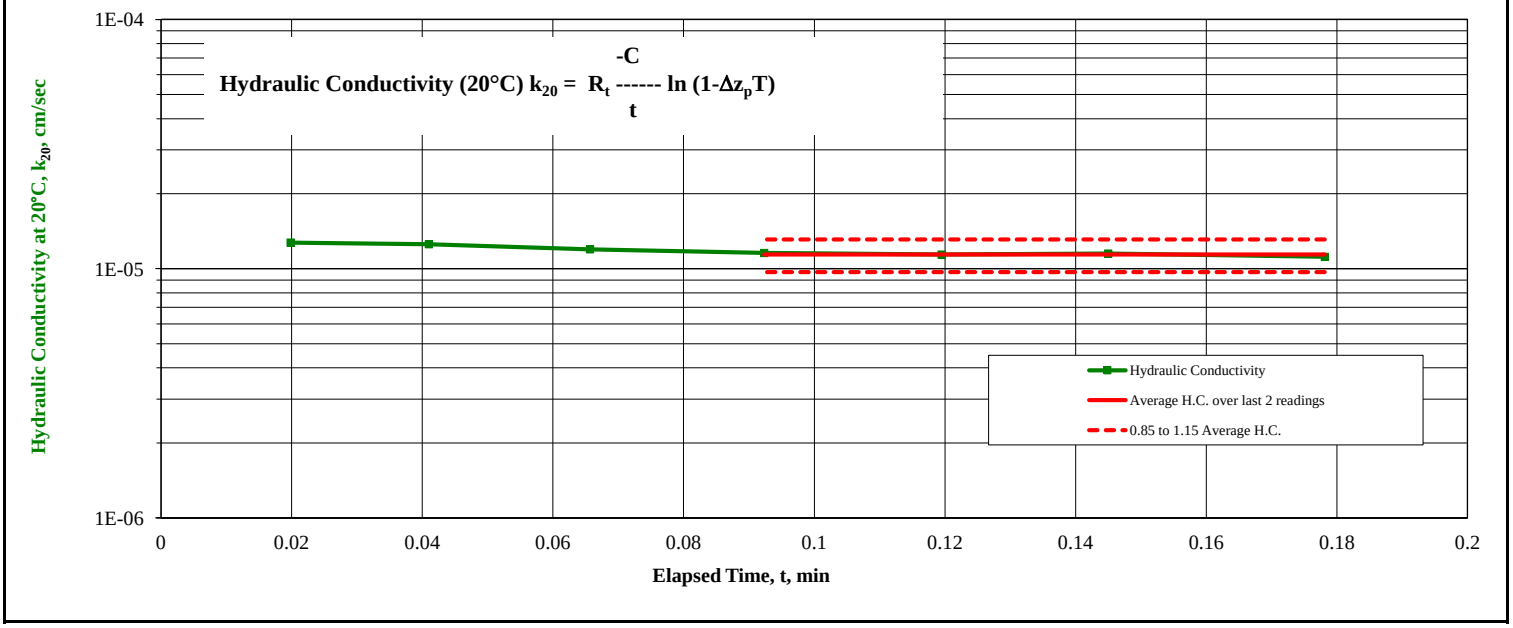
TEST CONSTANTS & EQUATIONS	
Pipette Area, $\mathbf{a_n}$ - cm^2	0.031416
Annulus Area, $\mathbf{a_a}$, cm^2	0.76712
Manometer Constant, $\mathbf{M_1} = a_a a_n/(a_a+a_n)$, cm^2	0.03018
Manometer Constant, $\mathbf{M_2} = 1 + a_p/a_a$	1.0410
Sample Constant, $\mathbf{S} = L/A$, cm^{-1}	0.184
Specific Gravity, $\boldsymbol{\delta} = \delta_{hg} - \delta_w$, gm/cc	12.562
Test Constant, $\mathbf{C} = M_1 S/\delta$	4.42E-04
Mercury Level at Equilibrium, $\mathbf{R_{eq}}$, cm	3.6
Mercury Level of Pipette at t=0, $\mathbf{R_{p0}}$, cm	6.5
Initial Head Difference, $\mathbf{z_1} = (R_{p0}-R_{eq})M_2$, cm	3.02
Trial Constant, $\mathbf{T} = M_2 / z_1$, cm	0.3448
Temperature Correction for 20°C, $\mathbf{R_t}$	0.976

SAMPLE SUMMARY	
Avg. Hydraulic Conductivity, k_{20}, cm/sec	**1.1E-05**
Initial Water Content, %	20.7%
Initial Dry Density, pcf	100.4
% Compaction	95.0%
Sample Status	Remolded
B Parameter	96
Permeant	Deaired Water
Cell Pressure, psi	105
Back Pressure, psi	100
Avg.(Mid-Height) Confining Stress, psi	5
Maximum Gradient	4.9
Average Test Temperature, °C	21.0

TEST DATA

t_i Elapsed Time	R_{pt} Mercury Height	Δz_p R_{p0}-R_{pt}	i Gradient	H_t Head	ΔH_t Percent of Initial Head from t=0	σ'_{max} Effective Stress Max	σ'_{min} Effective Stress Min	k_{20} Hydraulic Conductivity
min	*cm*	*cm*	*cm / cm*	*cm*	*%*	*psi*	*psi*	*cm/sec*
0.00	6.5	0	4.9	37.9	100.0%	5.27	4.73	NA
0.02	6.4	0.1	4.7	36.6	96.6%	5.26	4.74	1.27E-05
0.04	6.3	0.2	4.6	35.3	93.1%	5.25	4.75	1.25E-05
0.07	6.2	0.3	4.4	34.0	89.7%	5.24	4.76	1.20E-05
0.09	6.1	0.4	4.2	32.7	86.2%	5.23	4.77	1.16E-05
0.12	6	0.5	4.1	31.4	82.8%	5.22	4.78	1.14E-05
0.15	5.9	0.6	3.9	30.1	79.3%	5.21	4.79	1.15E-05
0.18	5.8	0.7	3.7	28.8	75.9%	5.20	4.80	1.12E-05

ELAPSED TIME vs. HYDRAULIC CONDUCTIVITY



Input Validation: ALO Reviewed By: SVG Date Tested: 6/2/2016

Note: The average Hydraulic Conductivity is calculated using the average of the last 4 determinations where all requisite flow and Hydraulic Conductivity conditions are achieved!

Prerequisits: Inflow / Outflow Ratio = 1 by definition of test procedure. Final Hydraulic Conductivity = +-25% of average Hydraulic Conductivity when k > 1E-8 cm/sec and +-50% when k < 1E-8 cm/sec.

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER

ASTM D5084-00 Method F; Mercury U-Tube Permometer - Inflow Volume = Outflow Volume

Client	Hull & Associates, Inc.	Boring	NA
Client Project	Rocky Ridge Development	Depth	NA
Project No.	37424	Sample	B16-1161
Visual Description	67% Soil/ 33% Lime	Lab Sample No.	37424002
Sample Condition	Remolded		

SAMPLE CONDITIONS		
Sample Status	Initial	Final
Tare Number	N77	43
Wt. Tare & WS, gm	48.58	720.25
Wt. Tare & DS, gm	42.08	605.79
Wt. Tare, gm	8.24	82.44
Moisture Content, %	19.2%	21.9%
Wt. Tube & WS., gm	624.3	NA
Wt. Of Tube, gm	0	NA
Wt. Of WS., gm	624.3	638.2
Length 1, in	3	2.971
Length 2, in	3	2.984
Length 3, in	3	2.947
Top Diameter, in	2.864	2.845
Middle Diameter, in	2.865	2.843
Bottom Diameter, in	2.8655	2.868
Average Length, **L**, cm	7.62	7.54
Average Area, **A**, cm^2	41.59	41.22
Sample Volume, cc	316.9	310.6
Unit Wet Wt., gm/cc	1.97	2.05
Unit Wet Wt., pcf	122.9	128.2
Unit Dry Wt., pcf	103.1	105.2
Unit Dry Wt., gm/cc	1.65	1.69
Specific Gravity, Assumed	2.7	2.7
Void Ratio, e	0.634	0.602
Porosity, n	0.388	0.376
Pore Volume, cc	122.94	116.69
Saturation, %	81.8%	

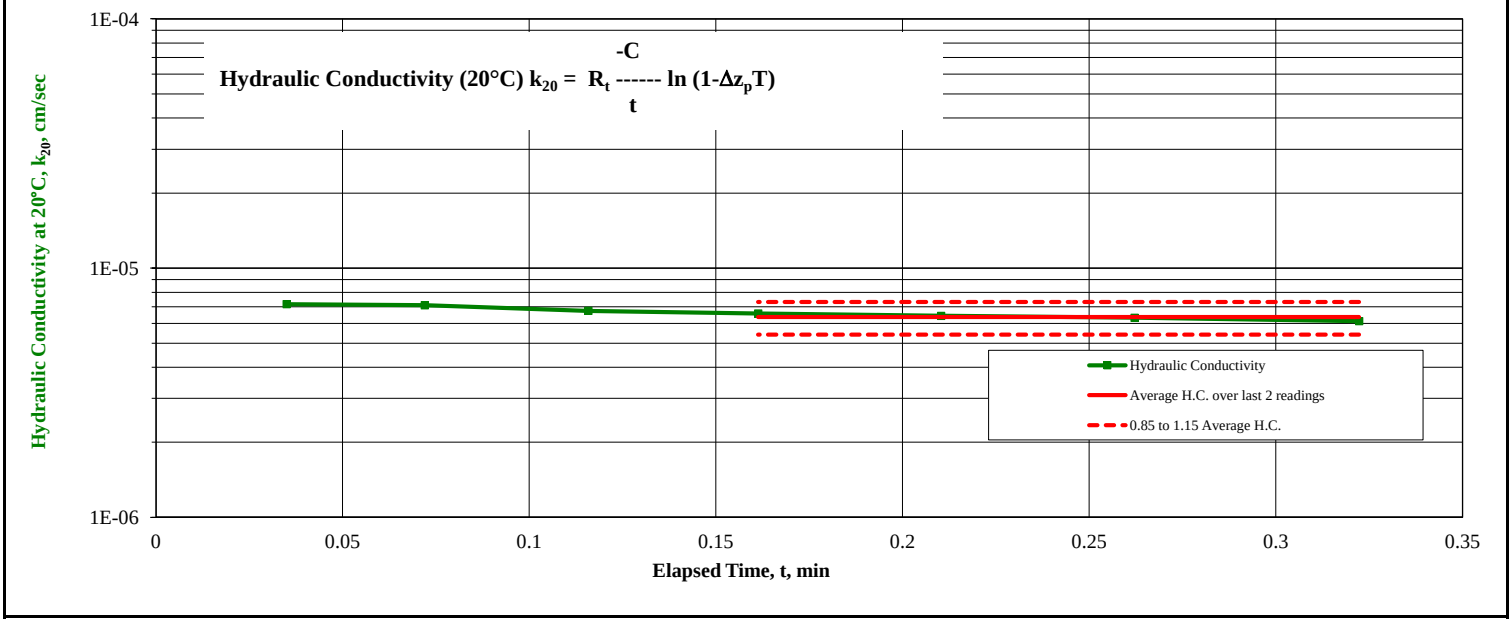
TEST CONSTANTS & EQUATIONS	
Pipette Area, $\mathbf{a_n}$ - cm^2	0.031416
Annulus Area, $\mathbf{a_a}$, cm^2	0.76712
Manometer Constant, $\mathbf{M_1} = a_a a_n/(a_a+a_n)$, cm^2	0.03018
Manometer Constant, $\mathbf{M_2} = 1 + a_p/a_a$	1.0410
Sample Constant, $\mathbf{S} = L/A$, cm^{-1}	0.183
Specific Gravity, $\boldsymbol{\delta} = \delta_{hg} - \delta_w$, gm/cc	12.562
Test Constant, $\mathbf{C} = M_1 S/\delta$	4.39E-04
Mercury Level at Equilibrium, $\mathbf{R_{eq}}$, cm	3.6
Mercury Level of Pipette at t=0, $\mathbf{R_{p0}}$, cm	6.5
Initial Head Difference, $\mathbf{z_1} = (R_{p0}-R_{eq})M_2$, cm	3.02
Trial Constant, $\mathbf{T} = M_2 / z_1$, cm	0.3448
Temperature Correction for 20°C, $\mathbf{R_t}$	0.976

SAMPLE SUMMARY	
Avg. Hydraulic Conductivity, k_{20}, cm/sec	**6.4E-06**
Initial Water Content, %	19.2%
Initial Dry Density, pcf	103.1
% Compaction	95.0%
Sample Status	Remolded
B Parameter	97
Permeant	Deaired Water
Cell Pressure, psi	105
Back Pressure, psi	100
Avg.(Mid-Height) Confining Stress, psi	5
Maximum Gradient	5.0
Average Test Temperature, °C	21.0

TEST DATA

t_i Elapsed Time	R_{pt} Mercury Height	Δz_p R_{p0}-R_{pt}	i Gradient	H_t Head	ΔH_t Percent of Initial Head from t=0	σ'_{max} Effective Stress Max	σ'_{min} Effective Stress Min	k_{20} Hydraulic Conductivity
min	*cm*	*cm*	*cm / cm*	*cm*	*%*	*psi*	*psi*	*cm/sec*
0.00	6.5	0	5.0	37.9	100.0%	5.27	4.73	NA
0.04	6.4	0.1	4.9	36.6	96.6%	5.26	4.74	7.17E-06
0.07	6.3	0.2	4.7	35.3	93.1%	5.25	4.75	7.09E-06
0.12	6.2	0.3	4.5	34.0	89.7%	5.24	4.76	6.74E-06
0.16	6.1	0.4	4.3	32.7	86.2%	5.23	4.77	6.58E-06
0.21	6	0.5	4.2	31.4	82.8%	5.22	4.78	6.43E-06
0.26	5.9	0.6	4.0	30.1	79.3%	5.21	4.79	6.32E-06
0.32	5.8	0.7	3.8	28.8	75.9%	5.20	4.80	6.13E-06

ELAPSED TIME vs. HYDRAULIC CONDUCTIVITY



Input Validation: ALO Reviewed By: SVG Date Tested: 6/3/2016

Note: The average Hydraulic Conductivity is calculated using the average of the last 4 determinations where all requisite flow and Hydraulic Conductivity conditions are achieved!

Prerequisits: Inflow / Outflow Ratio = 1 by definition of test procedure. Final Hydraulic Conductivity = +-25% of average Hydraulic Conductivity when k > 1E-8 cm/sec and +-50% when k < 1E-8 cm/sec.

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER

ASTM D5084-00 Method F; Mercury U-Tube Permometer - Inflow Volume = Outflow Volume

Client	Hull & Associates, Inc.	Boring	NA
Client Project	Rocky Ridge Development	Depth	NA
Project No.	37424	Sample	B16-1162
Visual Description	33% Soil/ 67% Lime	Lab Sample No.	37424003
Sample Condition	Remolded		

SAMPLE CONDITIONS		
Sample Status	Initial	Final
Tare Number	V13	456
Wt. Tare & WS, gm	55.96	701.46
Wt. Tare & DS, gm	47.33	579.85
Wt. Tare, gm	7.98	85.46
Moisture Content, %	21.9%	24.6%
Wt. Tube & WS., gm	608.1	NA
Wt. Of Tube, gm	0	NA
Wt. Of WS., gm	608.1	621.4
Length 1, in	3	2.96
Length 2, in	3	2.965
Length 3, in	3	2.981
Top Diameter, in	2.864	2.827
Middle Diameter, in	2.865	2.838
Bottom Diameter, in	2.8655	2.865
Average Length, **L**, cm	7.62	7.54
Average Area, **A**, cm^2	41.59	40.96
Sample Volume, cc	316.9	308.9
Unit Wet Wt., gm/cc	1.92	2.01
Unit Wet Wt., pcf	119.7	125.5
Unit Dry Wt., pcf	98.2	100.7
Unit Dry Wt., gm/cc	1.57	1.61
Specific Gravity, Assumed	2.7	2.7
Void Ratio, e	0.716	0.672
Porosity, n	0.417	0.402
Pore Volume, cc	132.18	124.18
Saturation, %	82.7%	

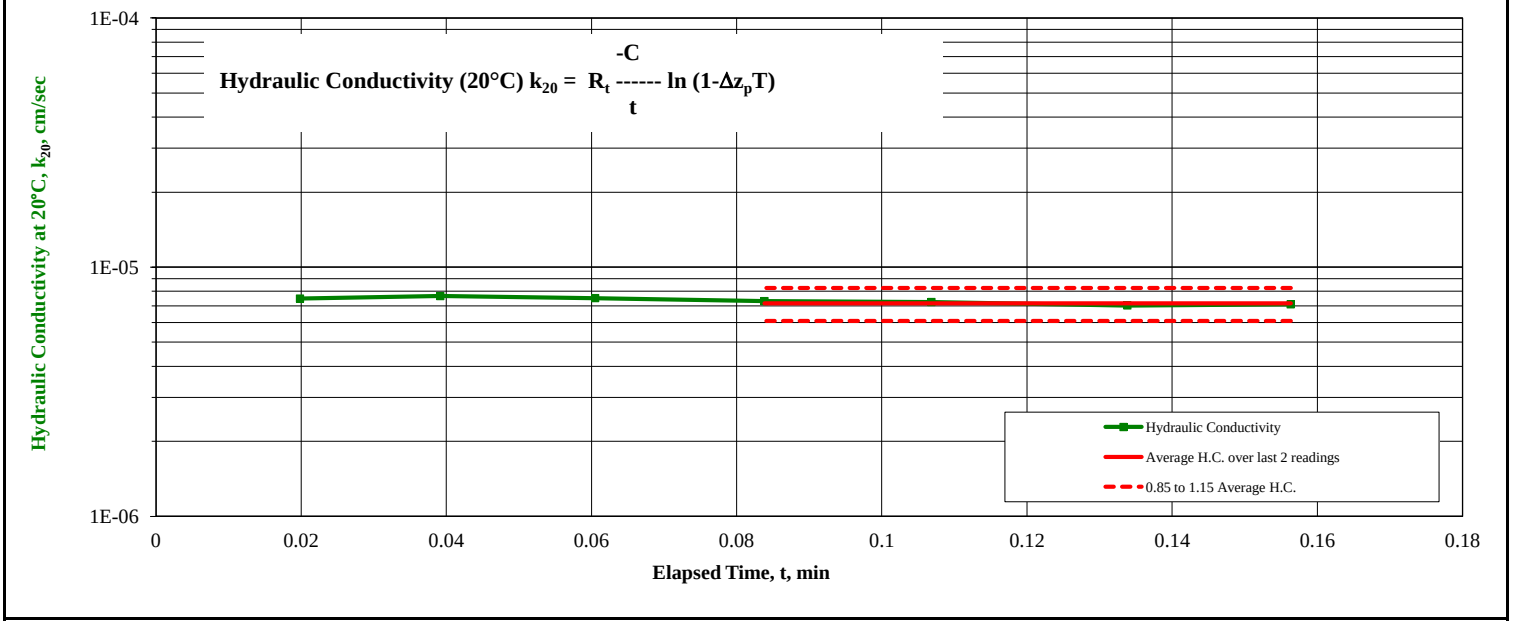
TEST CONSTANTS & EQUATIONS	
Pipette Area, $\mathbf{a_n}$ - cm^2	0.031416
Annulus Area, $\mathbf{a_a}$, cm^2	0.76712
Manometer Constant, $\mathbf{M_1} = a_a a_n/(a_a+a_n)$, cm^2	0.03018
Manometer Constant, $\mathbf{M_2} = 1 + a_p/a_a$	1.0410
Sample Constant, $\mathbf{S} = L/A$, cm^{-1}	0.184
Specific Gravity, $\boldsymbol{\delta} = \delta_{hg} - \delta_w$, gm/cc	12.562
Test Constant, $\mathbf{C} = M_1 S/\delta$	4.42E-04
Mercury Level at Equilibrium, $\mathbf{R_{eq}}$, cm	3.6
Mercury Level of Pipette at t=0, $\mathbf{R_{p0}}$, cm	8.5
Initial Head Difference, $\mathbf{z_1} = (R_{p0}-R_{eq})M_2$, cm	5.10
Trial Constant, $\mathbf{T} = M_2 / z_1$, cm	0.2041
Temperature Correction for 20°C, $\mathbf{R_t}$	0.976

SAMPLE SUMMARY	
Avg. Hydraulic Conductivity, k_{20}, cm/sec	**7.2E-06**
Initial Water Content, %	21.9%
Initial Dry Density, pcf	98.2
% Compaction	94.7%
Sample Status	Remolded
B Parameter	97
Permeant	Deaired Water
Cell Pressure, psi	105
Back Pressure, psi	100
Avg.(Mid-Height) Confining Stress, psi	5
Maximum Gradient	8.5
Average Test Temperature, °C	21.0

TEST DATA

t_i Elapsed Time	R_{pt} Mercury Height	Δz_p R_{p0}-R_{pt}	i Gradient	H_t Head	ΔH_t Percent of Initial Head from t=0	σ'_{max} Effective Stress Max	σ'_{min} Effective Stress Min	k_{20} Hydraulic Conductivity
min	*cm*	*cm*	*cm / cm*	*cm*	*%*	*psi*	*psi*	*cm/sec*
0.00	8.5	0	8.5	64.1	100.0%	5.46	4.54	NA
0.02	8.4	0.1	8.3	62.8	98.0%	5.45	4.55	7.48E-06
0.04	8.3	0.2	8.2	61.5	95.9%	5.44	4.56	7.65E-06
0.06	8.2	0.3	8.0	60.2	93.9%	5.43	4.57	7.51E-06
0.08	8.1	0.4	7.8	58.8	91.8%	5.42	4.58	7.31E-06
0.11	8	0.5	7.6	57.5	89.8%	5.41	4.59	7.25E-06
0.13	7.9	0.6	7.5	56.2	87.8%	5.40	4.60	7.02E-06
0.16	7.8	0.7	7.3	54.9	85.7%	5.39	4.61	7.09E-06

ELAPSED TIME vs. HYDRAULIC CONDUCTIVITY



Input Validation: ALO Reviewed By: SVG Date Tested: 6/4/2016

Note: The average Hydraulic Conductivity is calculated using the average of the last 4 determinations where all requisite flow and Hydraulic Conductivity conditions are achieved!

Prerequisits: Inflow / Outflow Ratio = 1 by definition of test procedure. Final Hydraulic Conductivity = +-25% of average Hydraulic Conductivity when k > 1E-8 cm/sec and +-50% when k < 1E-8 cm/sec.

APPENDIX D

Model Summary Report

QUARRY DEWATERING/REGIONAL DRAWDOWN MODEL
ROCKY RIDGE QUARRY
GRAYTOWN, OHIO

7/6/16

Prepared by

Tim Douthit
In Aqua Veritas, LLC

Contents

LIST OF FIGURES (APPENDIX I)

LIST OF TABLES (APPENDIX II)

1.0 MODEL SETUP AND DESIGN

1.1 Introduction

In order to determine the potential water table drawdown associated with quarry dewatering operations conducted at the Rocky Ridge Quarry, Graytown Ohio (Site), a computer-based numerical simulation of the Site and its surrounding area was constructed and evaluated. The simulation of the projected groundwater depression, and subsequent rebound, was conducted using Waterloo Hydrogeologic's Visual Modflow (version 4.3). Visual ModFlow is a well-known three-dimensional groundwater flow model that uses code originally developed by the USGS (MODFLOW). MODFLOW is a finite-difference groundwater flow model, which can accommodate anisotropic, heterogeneous aquifers in two or three-dimensional domains. The model allows transient flow simulations, and can handle confined, semi-confined, or unconfined conditions under active pumping or variable natural flow regimes.

Three separate model scenarios were constructed and evaluated:

A. A calibration scenario in which current dewatering rates were simulated in the model, following which model results were compared to measured drawdown kinetics in the quarry itself and surrounding monitoring wells. This step was used to ascertain the Site's aquifer hydraulic properties.

B. A projected future area drawdown scenario in which modeled quarry dewatering rates were adjusted from the initial dewatering rates to the lower rates needed only to maintain a dry quarry. This scenario was run out to steady-state conditions and the resulting drawdown in the water table in the area surrounding the quarry was evaluated. Intermediate drawdown levels between the initial dewatering activities and equilibrium conditions were also calculated.

C. A rebound scenario in which dewatering was terminated and groundwater was allowed to return to background water table conditions. In this scenario, prior to cessation of the simulated dewatering activities, the modeled quarry was filled with low-conductivity material to evaluate intra-quarry flow velocities if the quarry were "plugged". Several fill material hydraulic conductivities were simulated in this scenario to provide a basis for comparison to the variety of proposed "plug" materials being considered for this phase of the project.

A Site Map, depicting the Site's location, nearby water well locations obtained from the ODNR database and the current quarry extent is illustrated on Figure 1.

1.2 Model Design

The horizontal model domain was 5,100 meters (16,732 feet) along its east-west boundary by 4,300 meters (14,108 feet) along its north-south boundary. This domain was broken up into 84 rows and 100 columns such that the model's grid dimensions were a consistent 50 by 50 meters. The horizontal model grid is shown in Figure 2. Site stratigraphy was represented in the model through the use of 10 layers, collectively representing two primary lithologic units at the Site. These included an unconsolidated upper clay unit, and a lower limestone/dolomite bedrock unit. While the actual bedrock stratigraphy of the Site is complex, little is known about the individual hydrogeologic properties of the various stratigraphic layers. Consequently, the bedrock units were simulated collectively, and the flow model was calibrated according to their average hydraulic properties. Furthermore, at the Site and the surrounding areas, groundwater is encountered below the upper clay unit which varies between approximately 10 and 30 feet in thickness across the area of the model. Therefore, the hydraulic properties of the clay are important to the model only in the amount of precipitation recharge which migrates through the clay to reach the underlying limestone. This function of the model was controlled via the recharge infiltration rate and not the hydraulic properties of the simulated clay layer, which used the same inputs as the underlying limestones in the model. The layers in the model were used as follow:

Layer 1	Clay/uppermost bedrock unit
Layer 2	Uppermost portion of bedrock – a thin model layer used to contain river cells.
Layers 3 - 6	Bedrock layers between Layer 2 and the drain layer. These layers, along with layer 2, represent the quarried interval of the subsurface.
Layer 7	A thin bedrock layer used to contain drain cells.
Layer 7-10	Bedrock layers beneath the quarried interval and the model basement.

Surface topography was imported into the model from USGS Digital Elevation Model

(DEM) data, associated with the USGS Oak Harbor, Ohio topographic quadrangle map. Figure 3 illustrates the model's upper surface as defined by the DEM data import process. The bottom of the model was kept at a uniform elevation of 85 meters, approximately 100 meters below the model's surface elevation. The selection of the model bottom at 85 meters was arbitrary, but in the absence of known low-transmissivity units in the bedrock stratigraphy which would have provided rationale for specific model "basement" placement, the selected elevation value was deemed to be far enough beneath the quarried interval to avoid adversely affecting the results of the simulation. A sample section of the vertical model grid configuration is shown in Figure 4.

1.3 Parameter Inputs

Hydraulic Conductivity

The hydraulic properties of the bedrock aquifer were initially estimated based on the results of an aquifer step-pumping test described in ODNR Report # 48, (10/1969), conducted on "Well P-12" located approximately 3 miles to the southwest of the quarry. That test returned a hydraulic conductivity (K) value of a little under 1 foot per day (ft/d) assuming a saturated aquifer thickness value (b) of approximately 300 feet. This initial K value was subsequently refined in the model by calibrating K to the measured quarry drawdown under a constant dewatering rate (approximately 1,940 gallons per minute [gpm]), the quarry footprint, the quarry floor elevation (approximately 153 meters above mean sea level [~502 ft]), precipitation influx to the quarry based on the annual precipitation rate (~33.4 in/year) and the surrounding area's water table elevation. The result of this calibration indicated that the measured drawdown rate in the quarry and in the surrounding monitoring wells was well simulated using a bedrock horizontal hydraulic conductivity (Kxy) value of 3.75 ft/d coupled with a vertical hydraulic conductivity (Kz) of 0.375 feet per day. This value is higher than the results from the step test. However, the step test was a single well test and subject to well inefficiencies which may have given rise to the lower value calculated during the test. During the model calibration of the K value, the simulation of quarry dewatering was effected in the model through the use of a recovery well placed within the quarry footprint operating at 1,940 gpm.

Effective and total porosity, along with specific yield within the bedrock aquifer was

assumed to be 10%.

Precipitation Recharge to the Aquifer

Annual precipitation in this area, as noted above, averages approximately 33.4 in/year (National Weather Service). However, only a fraction of this precipitation reaches the aquifer, with the remainder being lost to surface run-off, stormwater management systems, evapotranspiration and other processes. No direct data reference for the immediate project area was found, but typical values for precipitation recharge to a bedrock aquifer have been reported to be on the order of 1/10th the annual precipitation rate (see for example Dumouchelle & Shiefer, 2002 and Pettyjohn & Henning, 1979, who reported aquifer recharge rates of between 3 and 5 inches per year in analogous areas of Ohio receiving between 30 and 40 inches of annual precipitation). The ratio of precipitation recharge to the aquifer to the annual precipitation rate can vary across a model domain based on, for example, the extent and type of ground cover (e.g. urban paved areas vs. rural and agricultural areas), as well as the thickness and characteristics of unsaturated overburden materials, and therefore this input parameter is treated within most models as an additional calibration parameter subject to variation based on other inputs and the performance of the model as a whole. For this simulation, the initial precipitation recharge to the aquifer value was set at 3.3 in/year. During the calibration process, this value was left unchanged as the calibration, discussed below, was primarily adjusted via the river boundaries to the north and the south of the quarry. The recharge over the quarry itself was left at 33.4 in/year since it was anticipated that precipitation within the area of the active quarry would eventually be captured by the quarry and the dewatering operation therein.

1.4 Boundary Conditions

The model boundary conditions are illustrated in Figure 5. There are two primary surface water bodies to the north and south of the quarry property. These are Packer Creek to the north and Toussaint Creek to the south, both within approximately one mile of the quarry. These creeks join approximately 3 miles to the east of the quarry to form the Toussaint River which itself discharges into Lake Erie another five miles further east. Since little is known about the bed conductance of these creeks, the surface water bodies

were all simulated using constant head cells in the model. Initial versions of the model, using coarse grid spacing, precisely duplicated the results of the constant head cell runs by using river cells and bed conductance values equivalent to the bedrock Kz value. However, subsequent model versions, using a more refined grid spacing, had convergence issues using narrow river cells with limited cell-to-cell connectivity, and thus constant head cells were used to improve model stability.

Initial head values for the constant head cells were estimated based on approximate river stage elevations obtained from the USGS Oak Harbor Ohio topographic map. These values were iteratively modified during the calibration process to provide an accurate baseline water table elevation at the quarry (~175.5 meters). The modifications were kept slight to preserve elevation consistency between the head cells and the surrounding topography. The head cells were assigned head values along a decreasing linear gradient from west to east. Based on the model calibration, the cells associated with the southern Toussaint Creek were assigned final values ranging from 174.75 meters in the west to 172.25 meters in the east, and the cells associated with the northern Packer Creek were assigned final values ranging from 172 meters in the west to 170.5 meters in the east.

All input parameters used in the model are summarized in Table 1.

2.0 MODEL CALIBRATION

The model was calibrated to current conditions as represented by the measured water table drawdown reported from the quarry itself, four surrounding monitoring wells (OW-1 through OW-4) and two nearby domestic supply wells ("DOMESTIC", located east of the quarry and "STONECO" located on the quarry property itself). The drawdown measured in the quarry and the surrounding wells was a function of the quarry dewatering process, initiated on 1/8/2016, at an average rate of approximately 1,940 gpm.

Figures 6 through 12 show comparisons of measured and modeled drawdowns in the quarry, OW-1, OW-2, OW-3, OW-4, DOMESTIC and STONECO, respectively (see Figure 1 for the map-view location of these measuring points). These figures show that the rate of drawdown (i.e. the slope of the data) are well matched in six of the seven monitored locations. In OW-1, while the slopes match well, there is a 1.5-meter discrepancy in the head value between the measured head and the modeled head at any given time step. This is due to a poor local initial (pre-dewatering) head calibration at that point (monitoring wells OW-1 through OW-4 were installed *after* the initiation of dewatering at the quarry). However, since the drawdown kinetics are well matched, a function of pumping rate vs hydraulic conductivity, this well's data still support the calibrated K value. The other wells, OW-2 through OW-4, DOMESTIC and the quarry monitoring point all have good slope matches as well as head variances of less than approximately a half meter. The statistical match of the measured vs modeled head after 116 days of quarry dewatering is shown in Figure 13.

The STONECO well shows only a fair match in slope along with a poor match in modeled head. However, this well, like DOMESTIC, is in present use, and as such may have unpredictable head values depending on use (pumping). Additionally, the modeled quarry drawdown diverges slightly from the measured drawdown towards the end of the data set (Figure 6). However, calibration in this location is very sensitive to even slight pumping variations or shut-downs. Some of these variations were accounted for (the pump was inactive on days 77 and 81, for example, breaks which were included in the modeled pumping schedule), but others may have been unaccounted for and/or pumping may have been at rates more or less than the average value of 1,940 gpm used in the model. Overall, however, the modeled drawdown is considered representative of field conditions.

In summary, the six wells with good simulations of the measured drawdown in the quarry strongly support the final K values of Kxy = 3.75 ft/day and Kz = 0.375 ft/day.

For additional support of the calibration, the modeled water extraction method was switched from a recovery well to drain cells located beneath the quarry floor in the deepest portions of the quarry. The drain cells were given a conductance value as low as possible which still allowed the quarry to be dewatered (250 m^2/day). While this model scenario will be discussed in more detail in subsequent sections, once the quarry was dewatered, the drainage flow needed to maintain a dry quarry, according to Visual Modflow's onboard Zone Budget module, was approximately 796 gpm, very similar the average pumping rate at the quarry during the last three years of operation between 1996 and 1999 (703 gpm) based on ODNR records.

A zone budget analysis of the calibrated model indicated that the difference between the volume of total water coming into the model and the total volume leaving the model was 2.3 cubic meters per day (about 0.03% of the overall water budget), demonstrating that this is a very well balanced model. A table demonstrating the water budget is provided as Table 1. Figure 14 shows the pre-dewatering piezometric surface generated by the calibrated model.

3.0 MODEL SIMULATIONS AND RESULTS

3.1 Quarry Drawdown Simulation

The model was used to estimate the time needed to completely dewater the quarry under existing pumping rates as well as estimate the total drawdown in the area of the quarry under continued dewatering activities.

In order to estimate the time needed to dewater the quarry, the model was run until the modeled recovery well ran dry. This occurred after approximately 280 model days, following which the model would not converge due to the repeated wetting/drying of the model cells associated with the recovery well. Utilizing drain cells for this estimate, while providing a more stable solution, gave rise to inconsistent dewatering rates – the drain's dewatering rate is a function of overlying head which decreases as the quarry is dewatered. Thus, a constant 1,940 gpm could not be maintained. Using the recovery well estimate, shown in Figure 15, approximately 13.5 meters of drawdown was achieved over 280 days. Assuming a roughly linear response, this equates to a drawdown rate of 0.05 meters per day (0.16 ft/day), within the range of what has been physically measured at the quarry to date (0.15 – 0.20 ft/day). Given a starting water table elevation of 175 meters and a quarry floor of 153 meters, the completed drawdown should be achieved in approximately 1.2 years at this groundwater extraction rate.

Utilizing the drain cells and running the simulation out to 3,650 model days (10 model years) allowed the drawdown in the quarry and in the surrounding area to reach near steady-state conditions. Figure 16 shows the calculated drawdown in six locations surrounding the quarry:

1. DOMESTIC – the existing domestic potable well to the west of the quarry along Route 590
2. TOUSSAINT_NORTH_RD – a modeled observation well due south of the quarry along Toussaint North Road
3. 1_MILE_WEST – a modeled observation well 1 mile due west of the quarry
4. LICKERT-HARDER ROAD – a modeled observation well at the intersection of

Lickert-Harder Road and Toussaint North Road, about 6/10ths of a mile to the east of the quarry

5. 1_MILE_EAST – a modeled observation well located one mile due east of the quarry
6. 1_MILE_NORTH – a modeled observation well located one mile due north of the quarry.

The drawdown curves in Figure 16 indicate that most of the expected drawdown will occur within the first three years of dewatering activities at the quarry, but also that drawdown values of up to about 7 meters could be achieved in nearby residential areas. Properties along Toussaint North Road and Route 590 will likely be most affected.

Figure 17 shows the modeled drawdown contours in map view for Model Day 3,650 and includes all of the water wells listed in the ODNR database within a mile's radius of the quarry.

3.2 Quarry Rebound Simulation

The final piezometric output from the dewatering model was used as the starting piezometric surface of the rebound simulations. The modeled quarry volume was assigned a low hydraulic conductivity value to simulate the "plugging" of the quarry, simulated dewatering activities were terminated, and the modeled water table was allowed to rebound back to equilibrium conditions. The two quarry "plug" material hydraulic conductivities initially anticipated to be simulated were 0.01 and 0.001 ft/day. However, numerical model instability (model non-convergence) prevented rebound simulations using K values below 0.008 ft/day. However, permeability testing of potential fill materials consisting of on-site soil and varying percentages of lime returned hydraulic conductivities ranging between 0.018 and 0.031 ft/day. Consequently, the rebound kinetics of the piezometric surface were modeled at "plug" K values of 0.008, 0.01, 0.1 and 1 ft/day which bracket the K values of the tested fill materials. Rebound kinetics were also compared to the hydraulic conditions expected in the event the quarry were left empty.

Figure 18 shows the water table rebound kinetics at the quarry itself, and Figure 19 shows the rebound at the DOM well location west of the quarry. These figures indicate that the

modeled rebound is generally insensitive to the K value of the fill material. There is a difference between the rebound of the water table simulated for an empty quarry and that simulated for a “plugged” quarry, but once the quarry is filled with a low permeability material, the water table rebound kinetics do not change appreciably from one fill material K value to the next. This is interpreted to be due primarily to the difference in effective porosity between an empty quarry and a “plugged” quarry. Delivery of water to the quarry location itself is dependent on the K value of the surrounding aquifer, not the K value of the plug, yet the time required to fill the quarry is greater if there is more empty space to fill vs. if the quarry volume has already been filled by a plug.

Based on the model, the rebound of the water table to background conditions will take several years to complete. Initial rebound of the water table will be relatively rapid due to the significant head difference between the surrounding aquifer and the quarry floor. As the external and internal head values become more similar, the rate of rebound will be reduced. The model suggests that full background conditions will be achieved within approximately 5 years, although 75% of background should be reached within approximately 1 year at the quarry location.

Once the model had reached steady-state in the rebound simulation, the output piezometric surface was input to a follow-up simulation utilizing particle tracking in order to evaluate groundwater flow patterns and velocities within the plugged quarry. This was conducted using a steady-state model (not a transient model which was used for both the drawdown and rebound simulations) with otherwise identical parameter inputs. Steady-state models are typically more numerically stable than transient models, and this evaluation was stable down to plug K values of 0.001 ft/day. Consequently, three model runs were conducted, one at a plug K value of 0.001 ft/day, one at a plug K value of 0.01 ft/day, and one at a plug K value of 0.10 ft/day to again bracket the expected actual K values of the proposed quarry fill materials.

Figure 20 shows an example cross-sectional slice of the quarry and the associated groundwater flow patterns. Regionally, the quarry is located on or near the groundwater divide between Toussaint Creek to the south and Packer Creek to the north. Hydrologically, groundwater divides are normally associated with a large vertical groundwater flow component. This tendency, coupled with a slight head elevation at the

quarry itself due to the resistance to infiltrating precipitation provided by the low-conductivity quarry plug, gave rise to a vertically downward primary groundwater flow direction within the plugged quarry. The model predicts that once groundwater exits the bottom of the plugged quarry, flow direction re-acquires a horizontal component and eventually, groundwater from the quarry will discharge to Toussaint Creek. Flow velocity within the quarry depends on the K value of the material used as a plug. For a plug K value of 0.10 ft/d, groundwater velocity was calculated to be 0.0065 ft/d. For a plug K value of 0.01 ft/d, groundwater velocity was calculated to be 0.0035 ft/d. For a plug K value of 0.001 ft/d, this value was reduced to approximately 0.0005 ft/d. These intra-quarry velocity values can be compared to the predicted groundwater velocity outside of the quarry, which, according to the model, ranges from 0.03 to 0.1 ft/day depending on distance from the creeks (groundwater velocity increases in the proximity of the creeks and decreases as one approaches the center of the groundwater divide between the two creeks). Figure 21 shows a map-view representation of the particle tracking (note that the particle movement within the quarry is vertically downward – the apparent horizontal movement of particles within the quarry footprint is actually beneath the quarry, not within the quarry). Figure 21 indicates that groundwater discharging from the quarry will enter Toussaint Creek. However, depending on the exact location of the groundwater divide, which may shift north or south depending on transient precipitation, drainage and creek flow characteristics, ultimate discharge of water to Packer Creek to the north is also a possibility.

3.3 Limitations

While the calibration process provides some assurance that the model accurately represents aquifer conditions and aquifer response to dewatering activities local to the Rocky Ridge quarry, the model was constructed using assumptions regarding boundary conditions which may or may not accurately reflect Site conditions. Important among those are the interaction of the area's surface water systems with the aquifer, and the role of this interaction with quarry operations. Furthermore, the model's use of spatially uniform aquifer characteristics likely oversimplifies actual conditions. Nonetheless, the relatively close match between measured and modeled water table elevation, along with the excellent simulation of the quarry's dewatering rates, indicate that if used appropriately, this model should provide reasonable guidance with respect to evaluating

existing and future quarry operational scenarios.

3.3 References

Dumouchelle DH and Shiefer MC, 2002. Use of streamflow records and basin characteristics to estimate groundwater recharge rates in Ohio: Ohio Department of Natural Resources, Division of Water, Bulletin 46

Pettyjohn WA and Henning R, 1979. Preliminary estimate of groundwater recharge rates, related streamflow and water quality in Ohio: Columbus Ohio, Ohio State University Water Resources Center, Project Completion Report 552

APPENDIX I
FIGURES

N

PACKER CREEK

RAILROAD TRACKS

LICKERT-HARDER ROAD

ROUTE 590

2-MILE RADIUS

1-MILE RADIUS

1_MILE_NORTH

1_MILE_WEST

1_MILE_EAST

STONECO

OW-1

OW-2

OW-3

OW-4

DOMESTIC

QUARRY CENTER

QUARRY

LICKERT_HARDER_RD

TOUSSAINT_NORTH_RD

TOUSSAINT NORTH ROAD

TOUSSAINT CREEK

4300
3000
2400
1800
1200
600
0

0
700
1400
2100
2800
3500
4200
4900
5100

MODEL DOMAIN BOUNDARY (VALUES IN METERS)

LEGEND

OBSERVATION WELL/LOCATION

WATER WELL (ODNR DATABASE)

Figure 1
Site Map

0 500

APPROXIMATE SCALE (METERS)

Rocky Ridge Quarry Site
Graytown, Ohio

d/b: TLD | 05/2016

N

PACKER CREEK

RAILROAD TRACKS

LICKERT-HARDER ROAD

ROUTE 590

1-MILE RADIUS

2-MILE RADIUS

RAILROAD TRACKS

TOUSSAINT NORTH ROAD

TOUSSAINT CREEK

MODEL DOMAIN BOUNDARY (VALUES IN METERS)

0 700 1400 2100 2800 3500 4200 4900 5100

0 600 1200 1800 2400 3000 4300

Figure 2
Horizontal Model Grid Layout

0 500

APPROXIMATE SCALE (METERS)

Rocky Ridge Quarry Site
Graytown, Ohio

d/b: TLD | 05/2016

N

2-MILE RADIUS

1-MILE RADIUS

PACKER CREEK

RAILROAD TRACKS

ROUTE 590

LICKERT-HARDER ROAD

RAILROAD TRACKS

TOUSSAINT NORTH ROAD

TOUSSAINT CREEK

MODEL DOMAIN BOUNDARY (VALUES IN METERS)

4300
3000
2400
1800
1200
600
0

0
700
1400
2100
2800
3500
4200
4900
5100

LEGEND

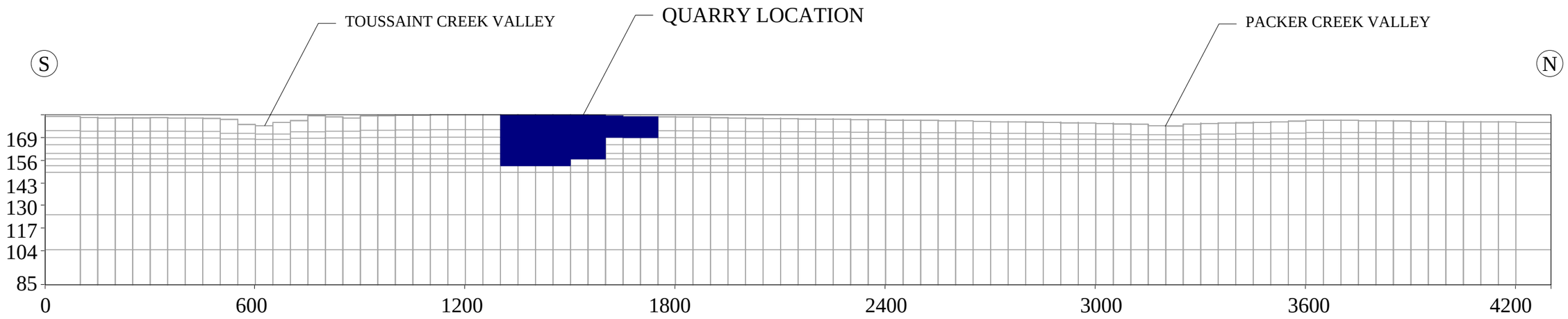
TOPOGRAPHIC CONTOUR (m)

Figure 3
Model Surface Elevation Contours

0 500
APPROXIMATE SCALE (METERS)

Rocky Ridge Quarry Site
Graytown, Ohio

d/b: TLD | 05/2016



ALL VALUES IN METERS

Figure 4
Vertical Model Grid Layout

0 300
APPROXIMATE SCALE (METERS)

Rocky Ridge Quarry Site
Graytown, Ohio

d/b: TLD | 05/2016

N

4300
3000
2400
1800
1200
600
0

2-MILE RADIUS

1-MILE RADIUS

RAILROAD TRACKS

ROUTE 590

LICKERT-HARDER ROAD

TOUSSAINT NORTH ROAD

TOUSSAINT CREEK

0 700 1400 2100 2800 3500 4200 4900 5100

MODEL DOMAIN BOUNDARY (VALUES IN METERS)

LEGEND

CONSTANT HEAD CELL

Figure 5
Model River Boundaries

0 500

APPROXIMATE SCALE (METERS)

Rocky Ridge Quarry Site
Graytown, Ohio

d/b: TLD | 05/2016

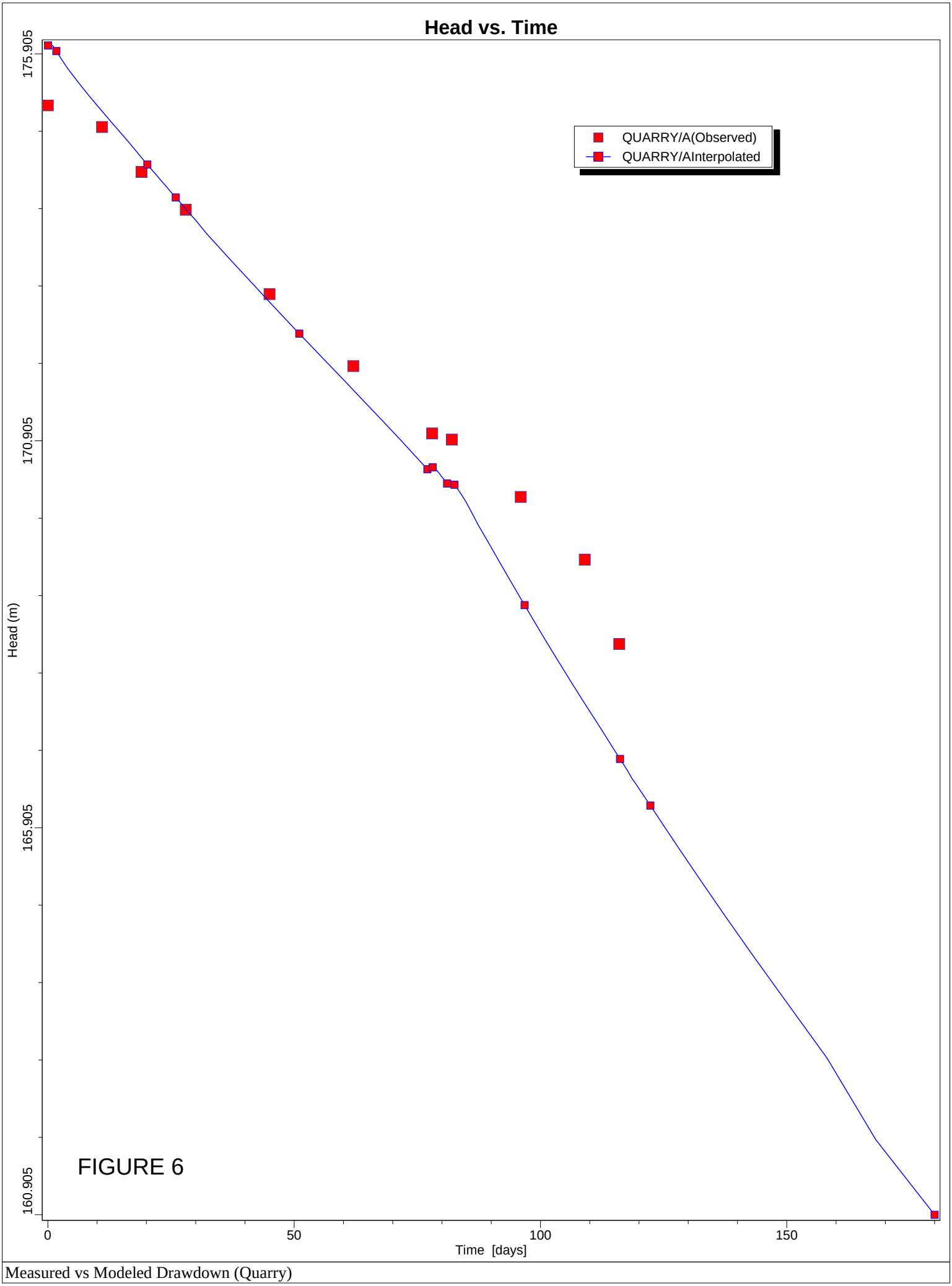
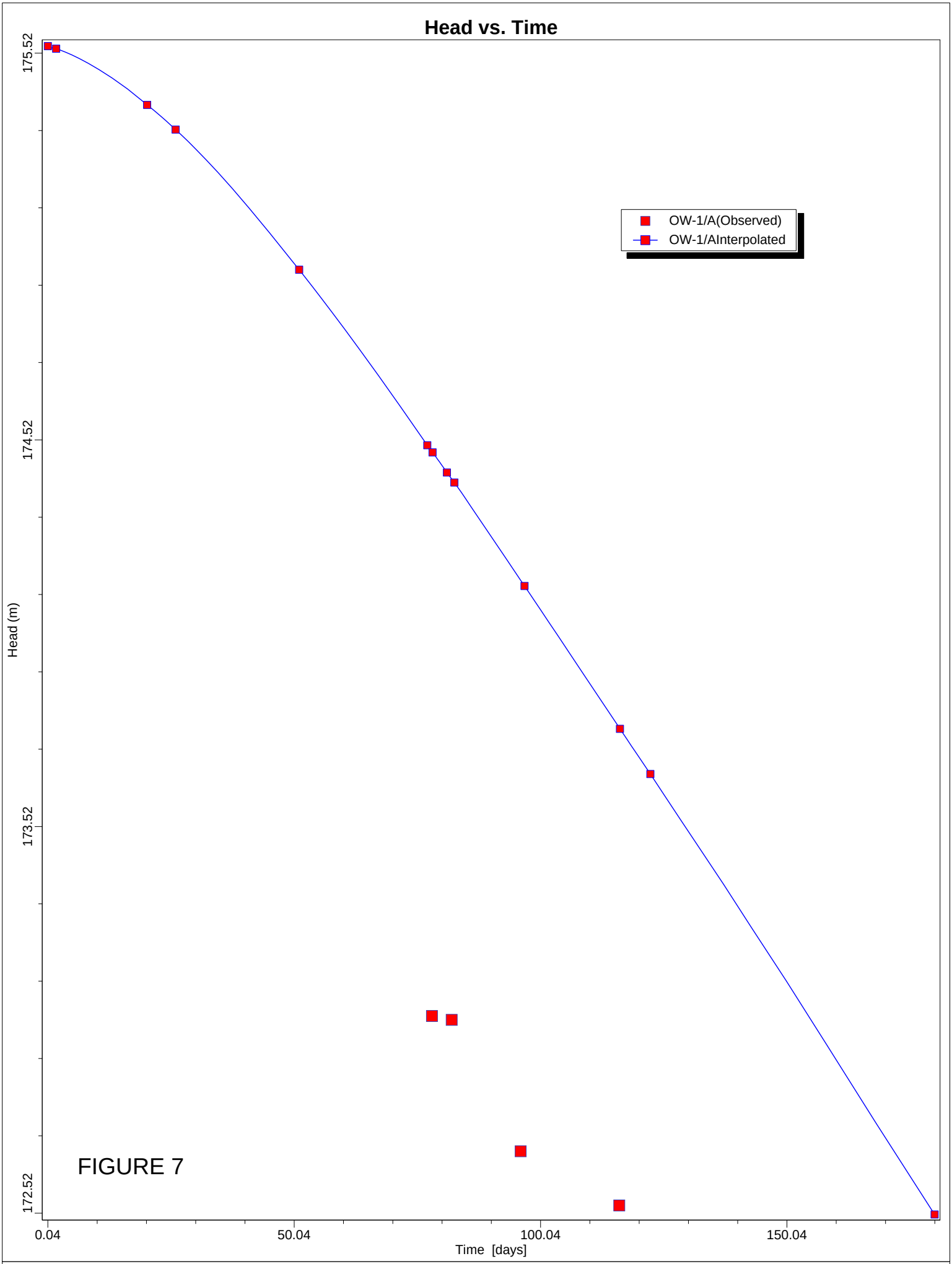


FIGURE 6

Measured vs Modeled Drawdown (Quarry)



Measured vs Modeled Drawdown (OW-1)

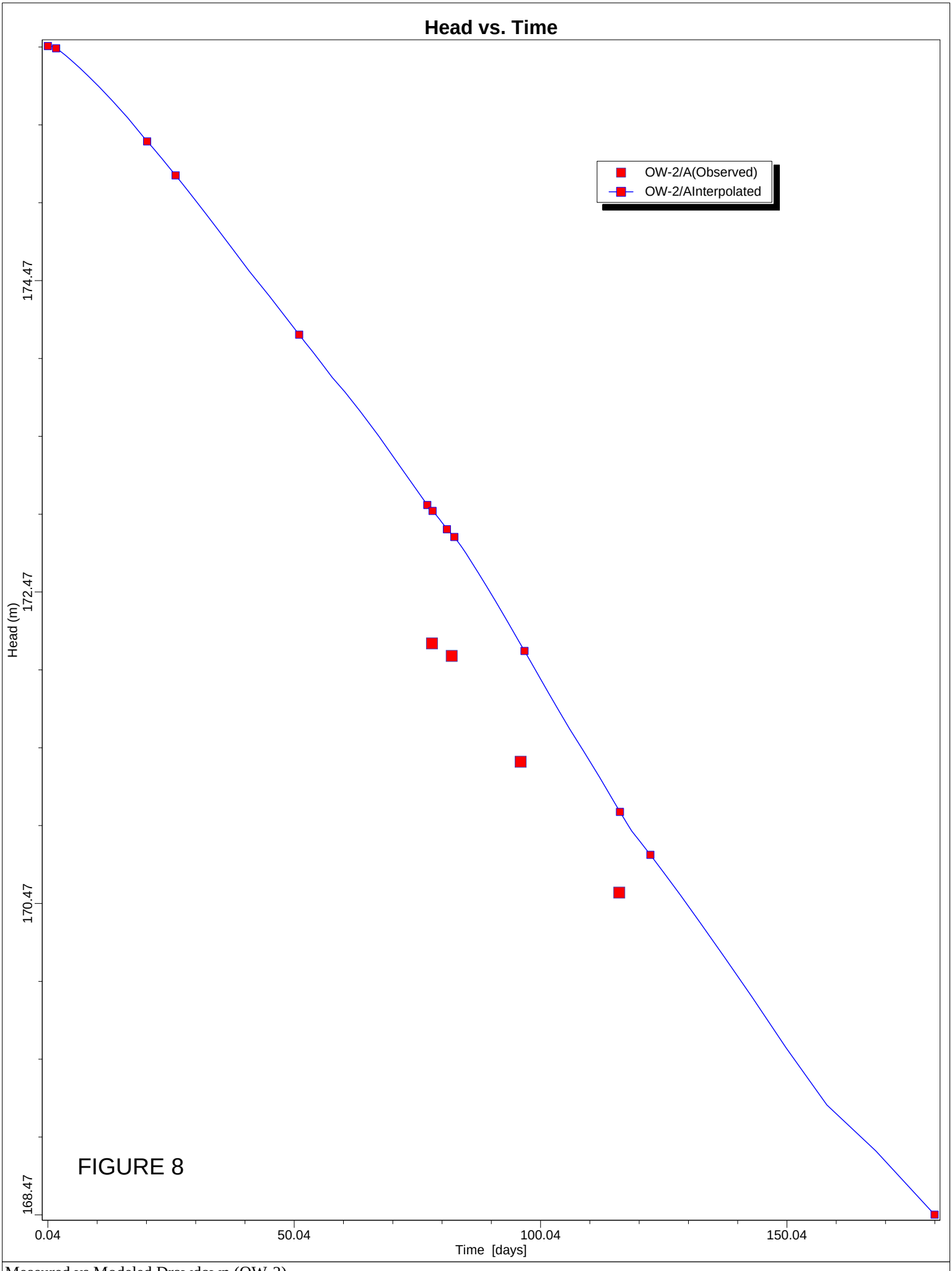


FIGURE 8

Measured vs Modeled Drawdown (OW-2)

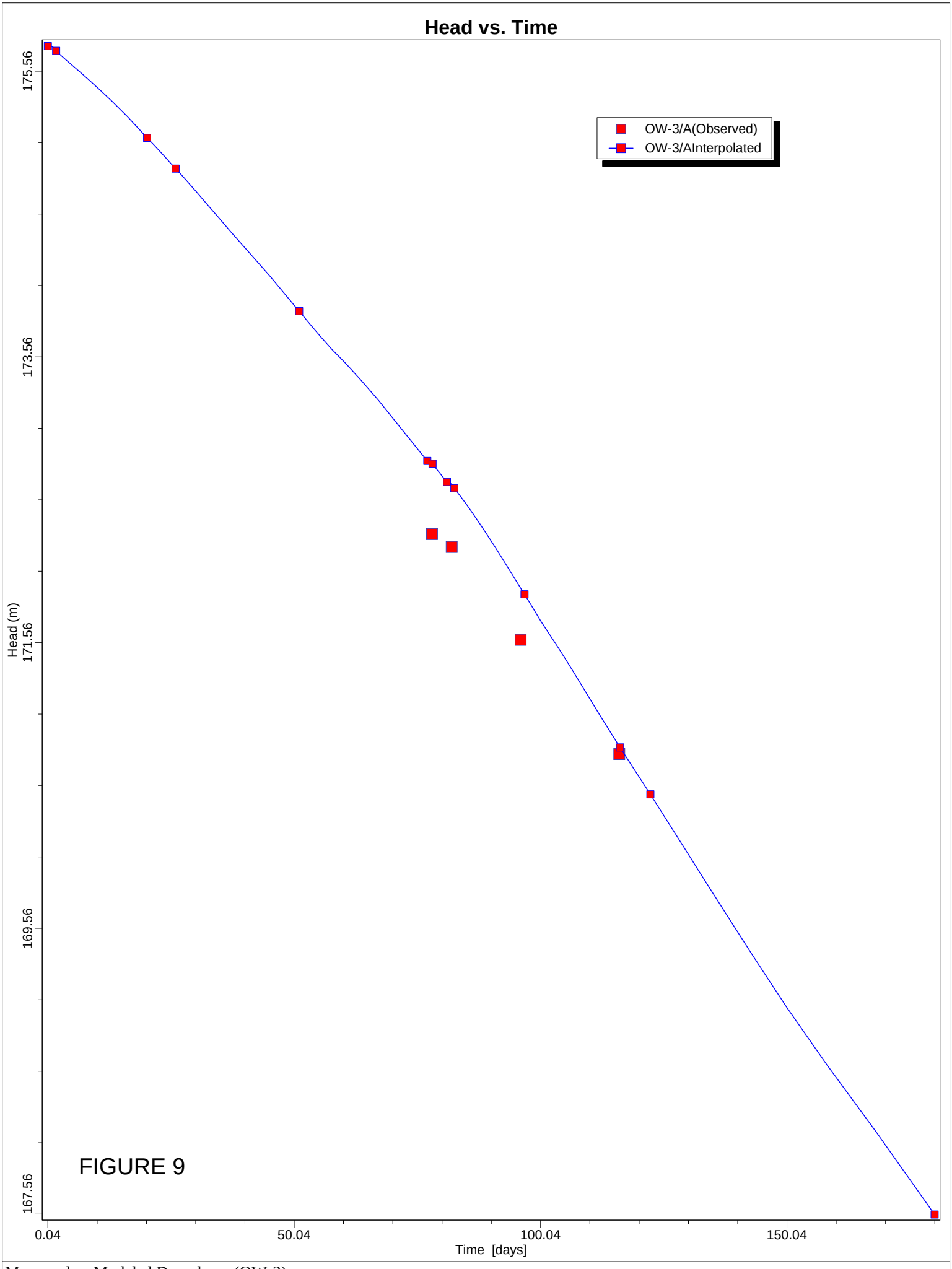


FIGURE 9

Measured vs Modeled Drawdown (OW-3)

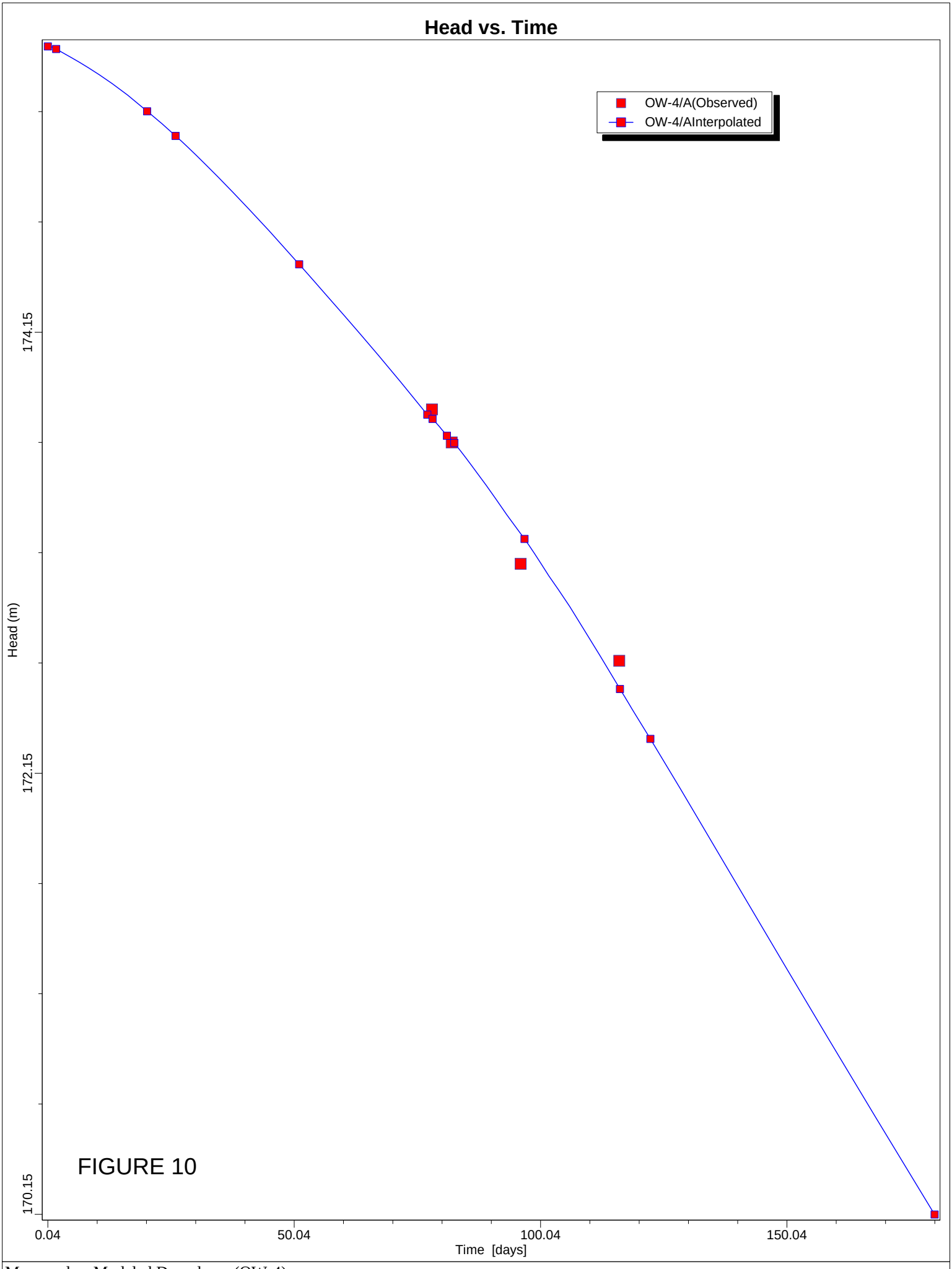


FIGURE 10

Measured vs Modeled Drawdown (OW-4)

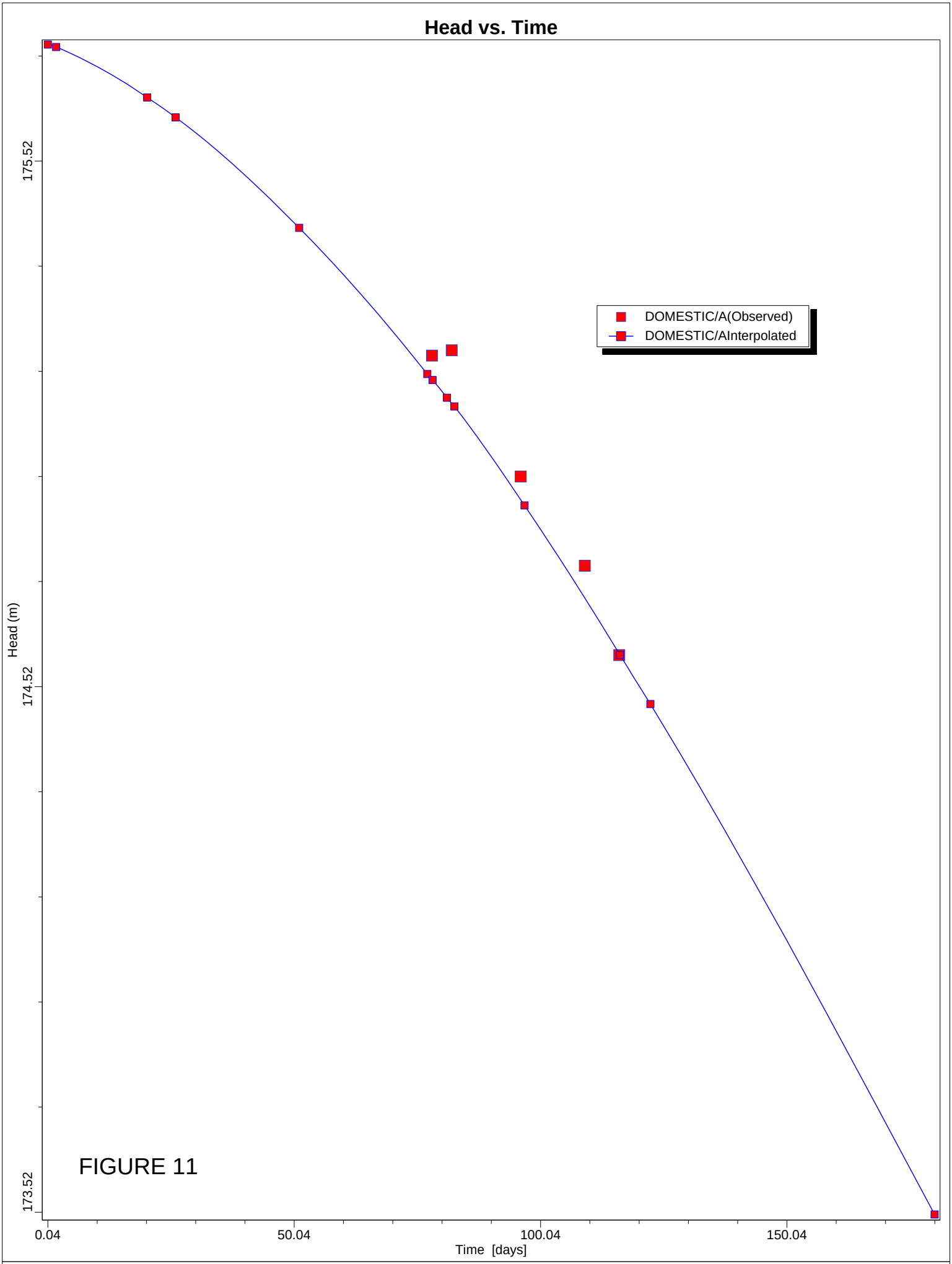


FIGURE 11

Measured vs Modeled Drawdown (DOMESTIC)

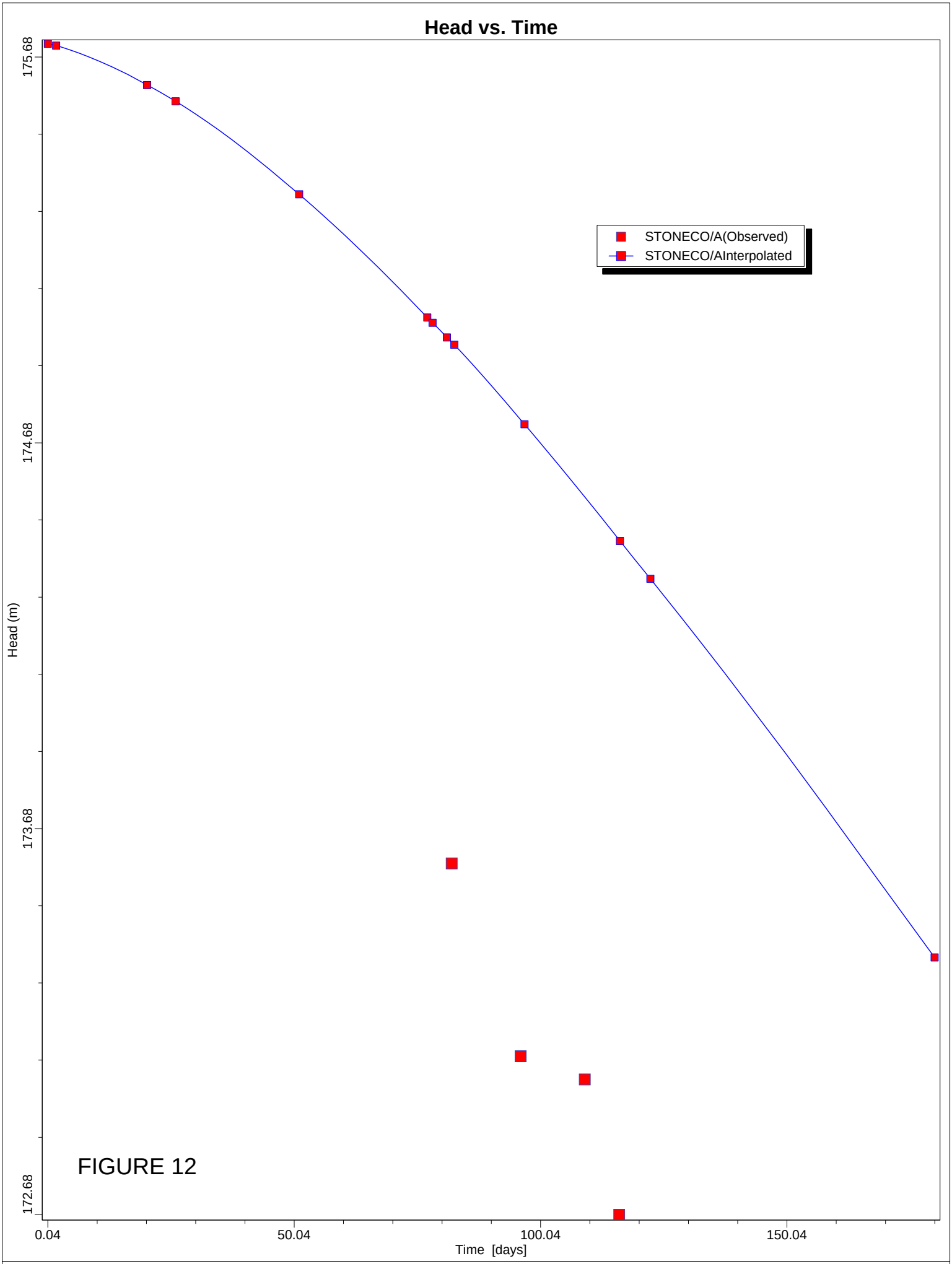


FIGURE 12

Measured vs Modeled Drawdown (STONECO)

Calculated vs. Observed Head : Time = 116 days

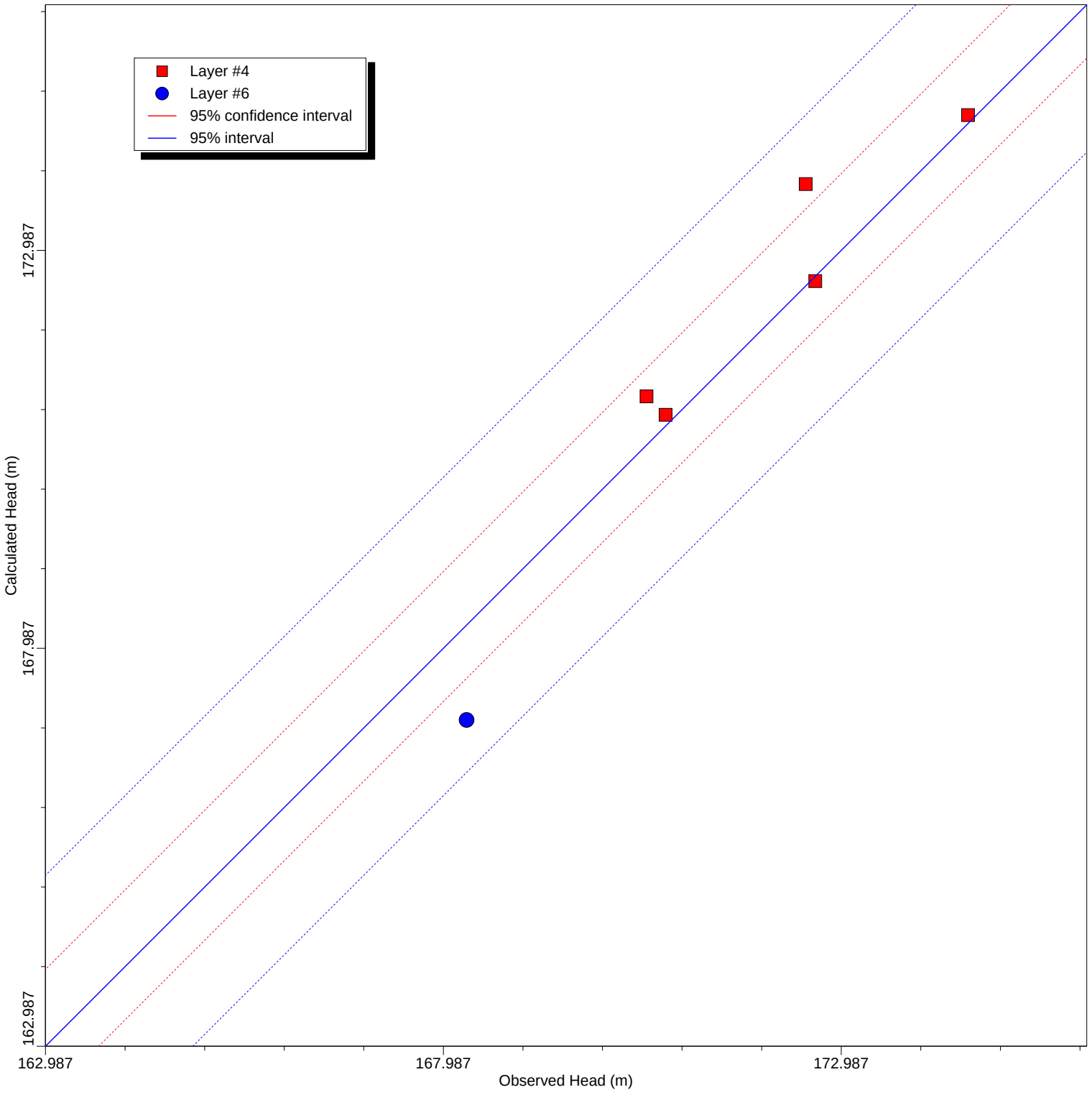


FIGURE 13

Max. Residual: 1.28 (m) at OW-1/A
Min. Residual: -0.058 (m) at OW-4/A
Residual Mean : 0.148 (m)
Abs. Residual Mean : 0.565 (m)

Num. of Data Points : 6
Standard Error of the Estimate : 0.334 (m)
Root Mean Squared : 0.761 (m)
Normalized RMS : 12.076 (%)
Correlation Coefficient : 0.966

Measured vs Modeled Head (T = 116 Days)

N

2-MILE RADIUS

1-MILE RADIUS

PACKER CREEK

1_MILE_NORTH

RAILROAD TRACKS

ROUTE 590

LICKERT-HARDER ROAD

STONECO

OW-1

QUARRY CENTER

QUARRY

OW-3

OW-4

1_MILE_WEST

DOMESTIC

LICKERT_HARDER_RD

1_MILE_EAST

TOUSSAINT_NORTH_RD

TOUSSAINT NORTH ROAD

TOUSSAINT CREEK

173.0

172.0

171.5

171.0

174.0

173.5

173.0

172.5

172.0

174.0

173.5

174.0

174.5

175.0

175.5

176.0

175.0

175.5

4300

3600

2400

1800

1200

600

0

0

700

1400

2100

2800

3500

4200

4900

5100

MODEL DOMAIN BOUNDARY (VALUES IN METERS)

LEGEND

OBSERVATION WELL/LOCATION

WATER TABLE CONTOUR (m)

0 500

APPROXIMATE SCALE (METERS)

Figure 14
Piezometric Surface Map (Pre-Dewatering)

Rocky Ridge Quarry Site
Graytown, Ohio

d/b: TLD | 05/2016

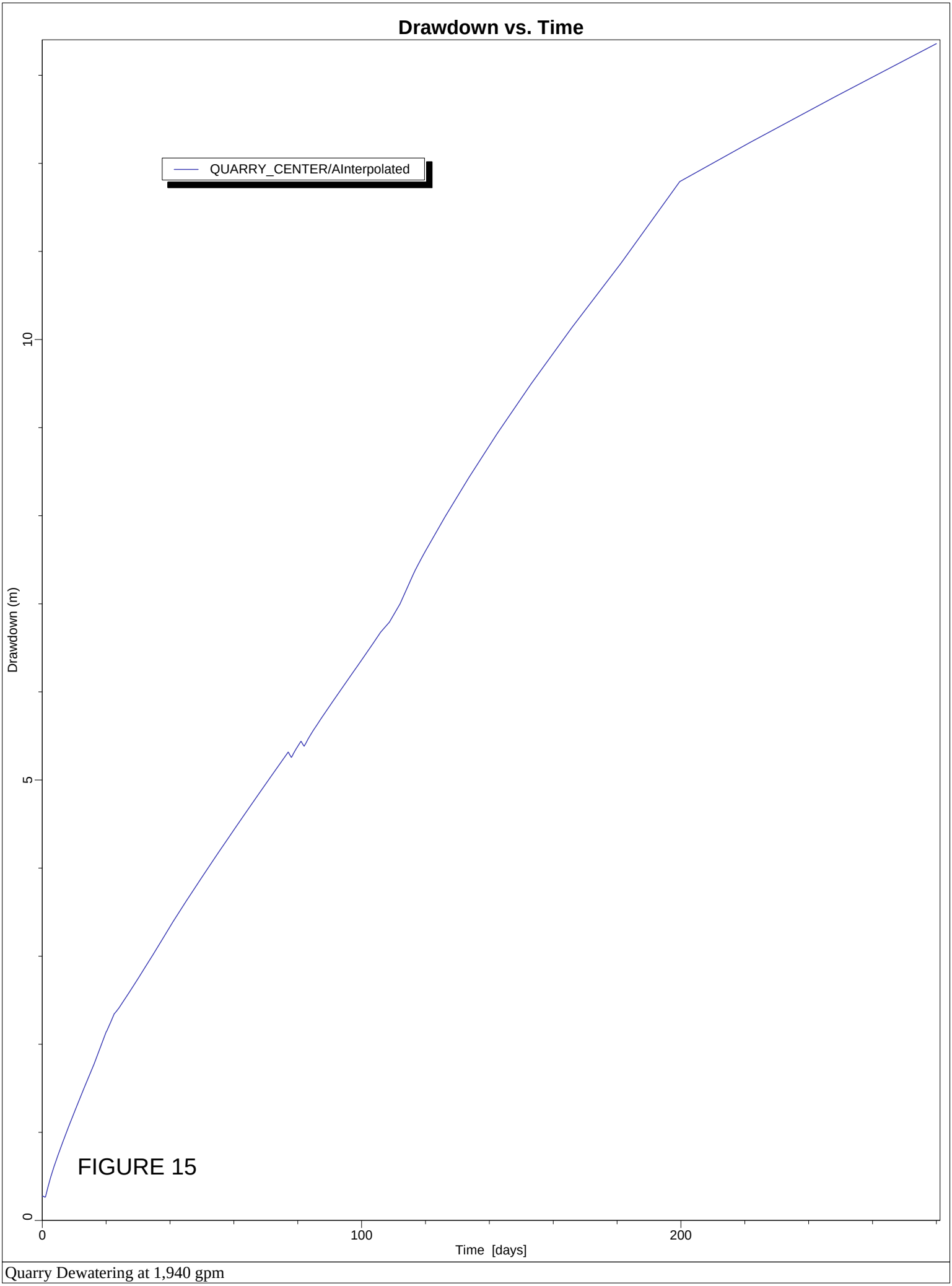
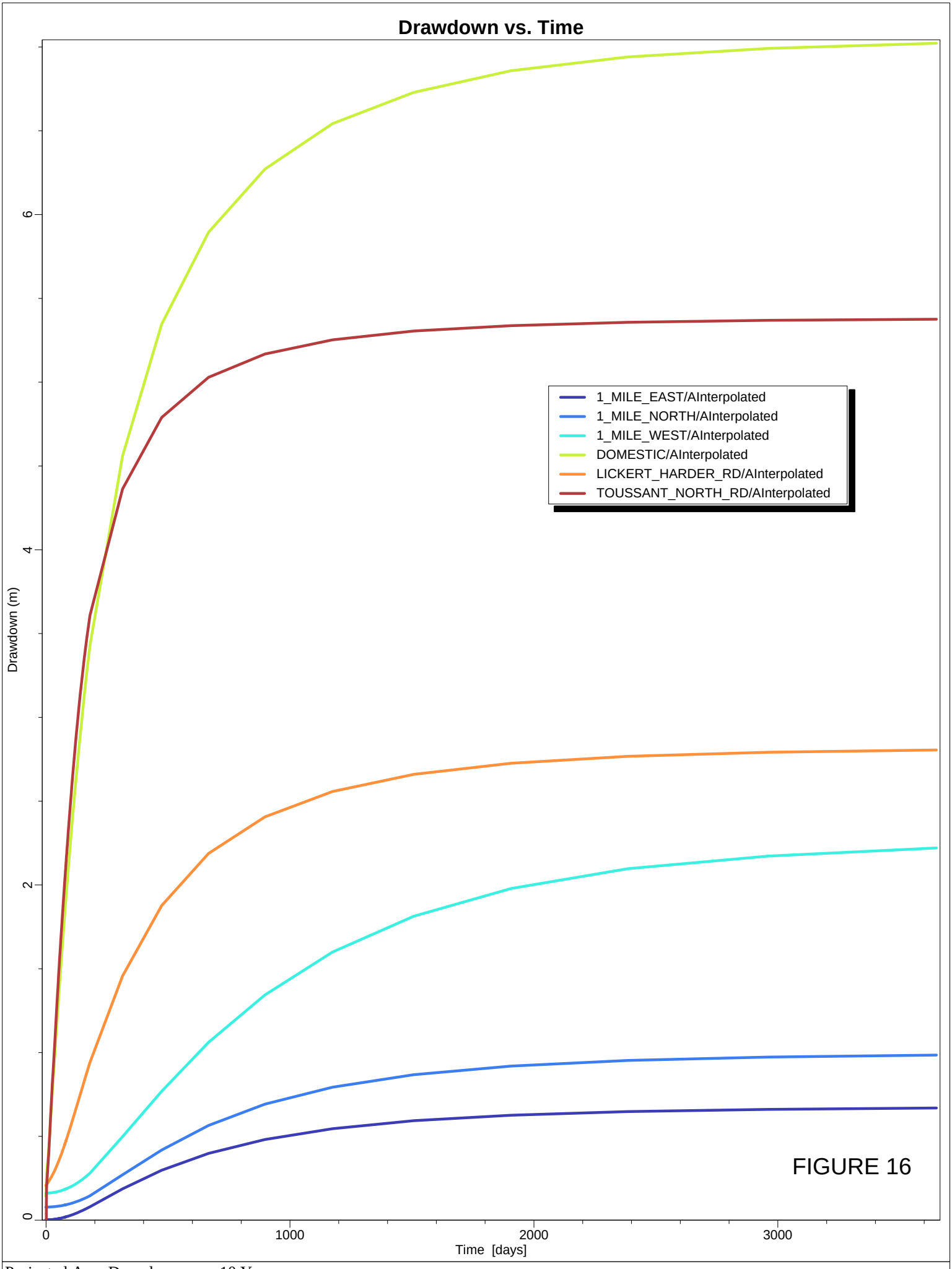


FIGURE 15

Quarry Dewatering at 1,940 gpm



Projected Area Drawdown over 10 Years

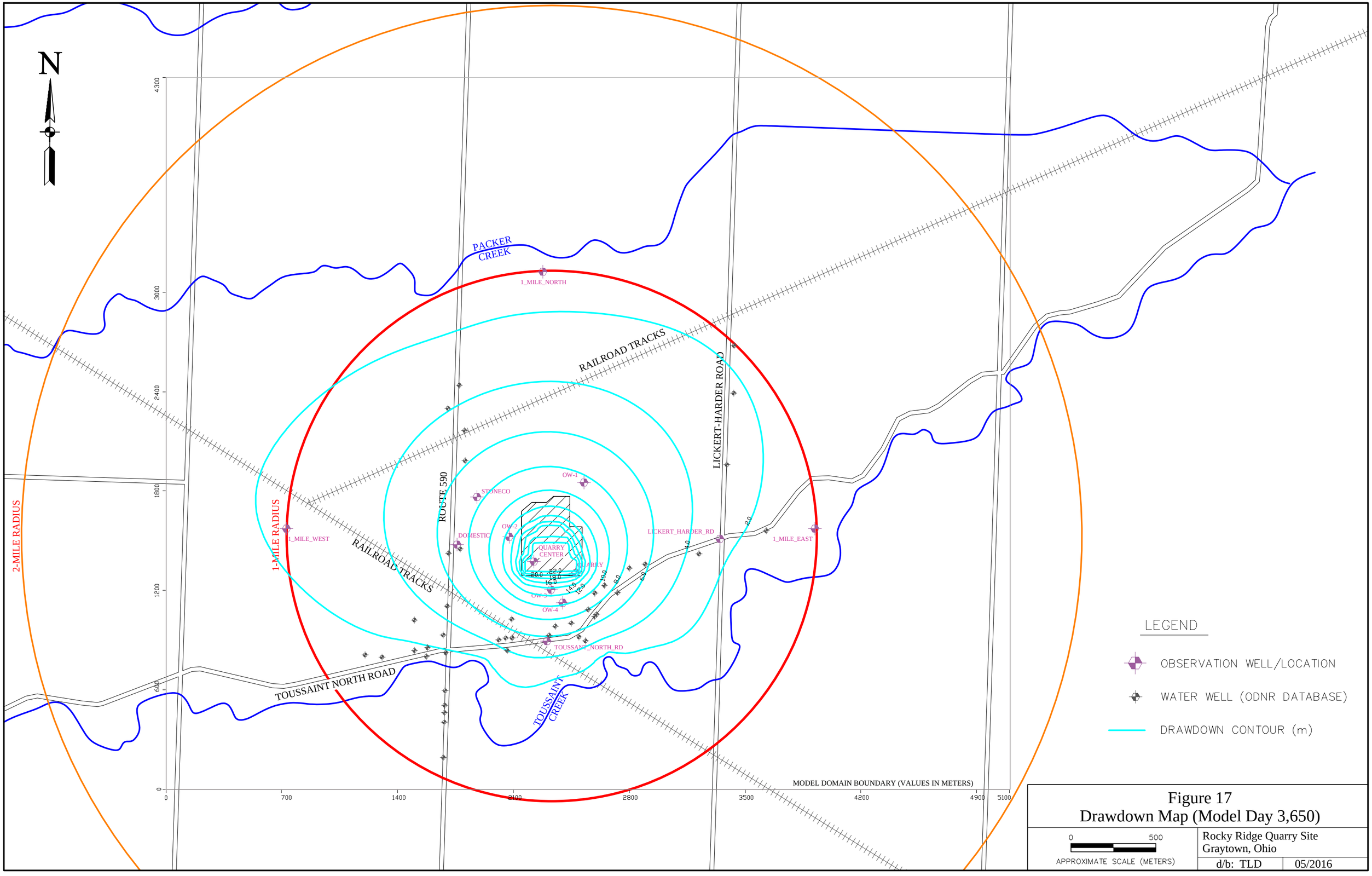


Figure 17
Drawdown Map (Model Day 3,650)

0 500
APPROXIMATE SCALE (METERS)

Rocky Ridge Quarry Site
Graytown, Ohio

d/b: TLD | 05/2016

Figue 18: Rebound vs Time
(Quarry Location)

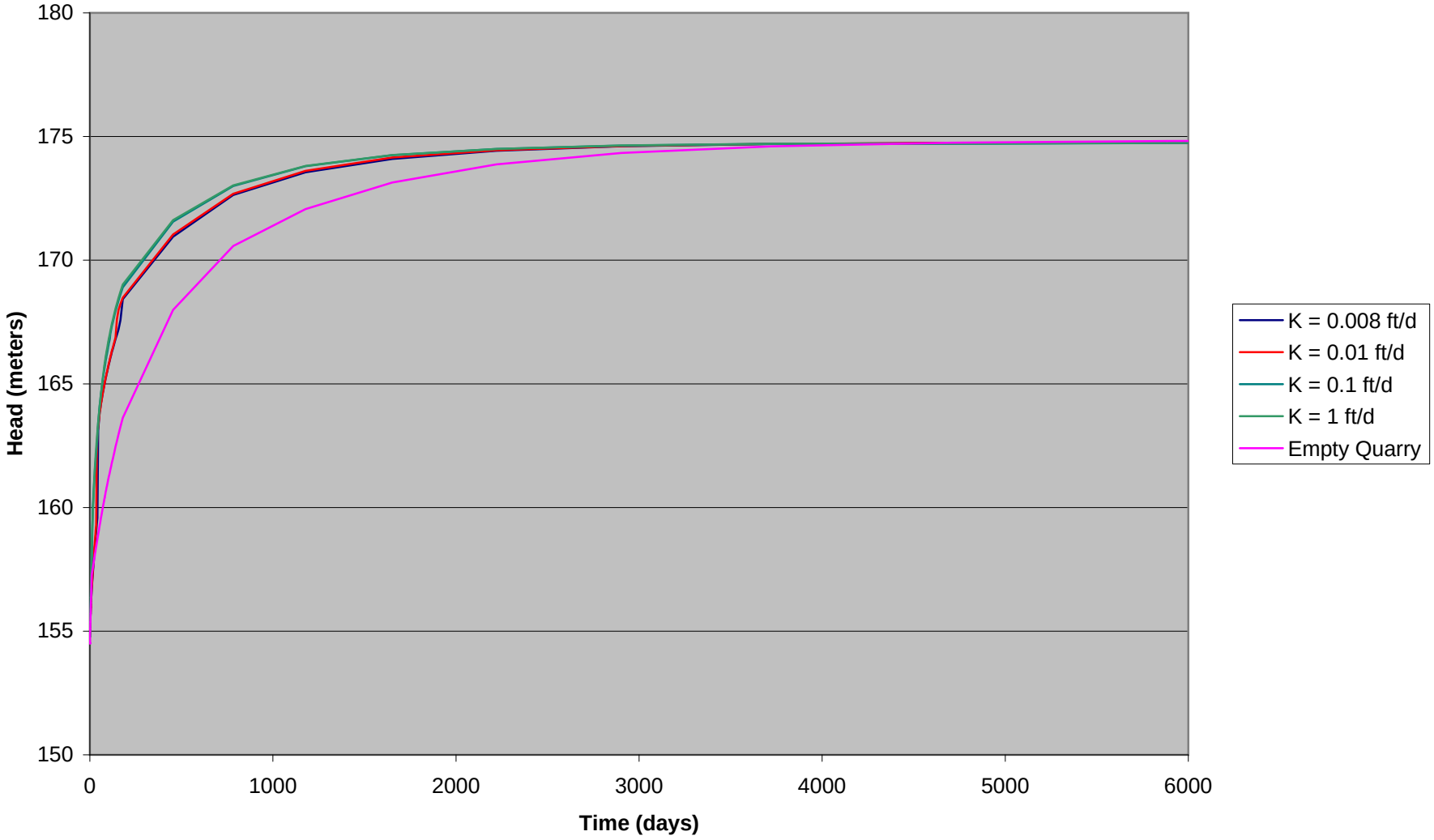


Figure 19: Rebound vs Time
(DOM Well Location)

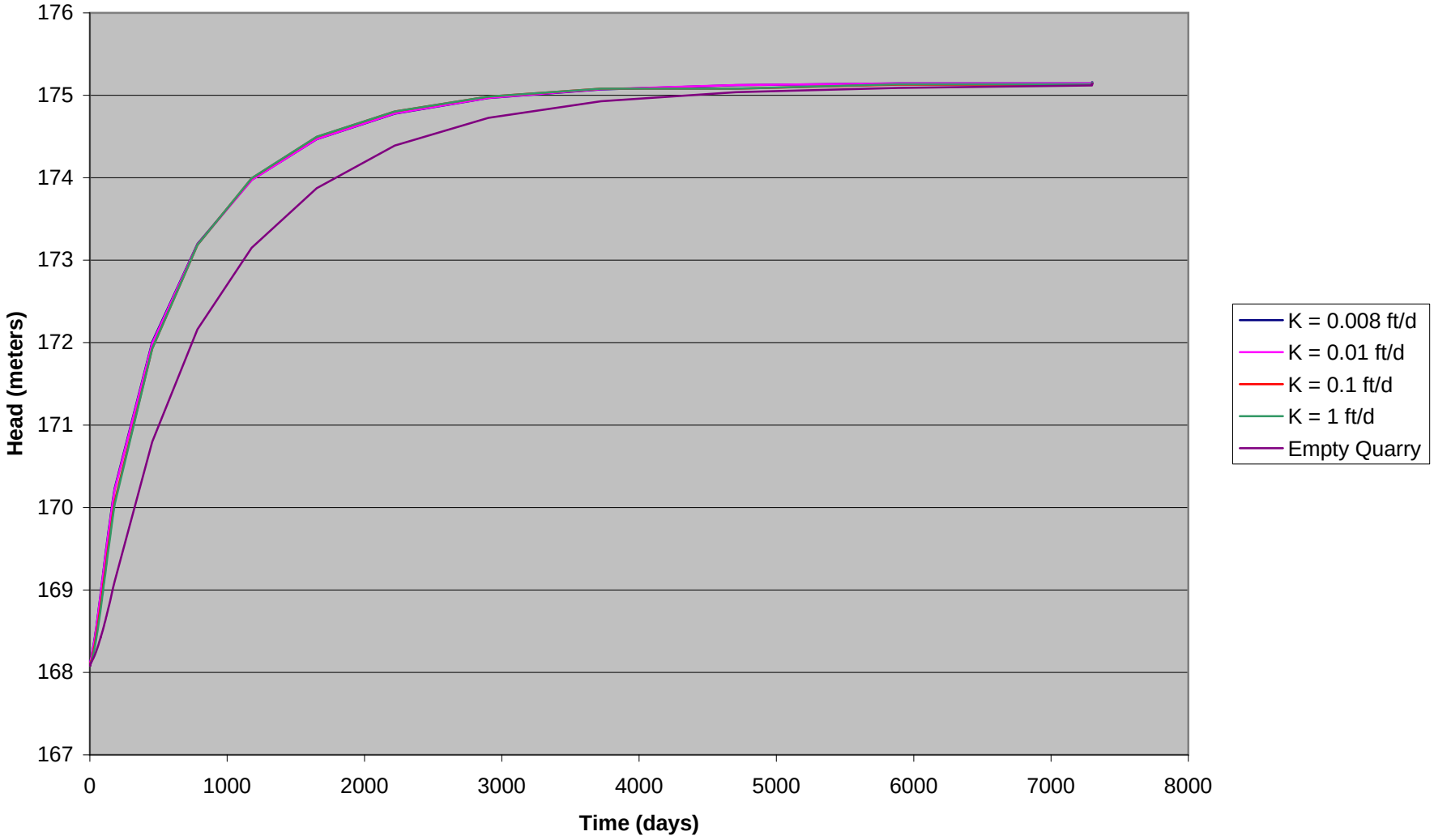
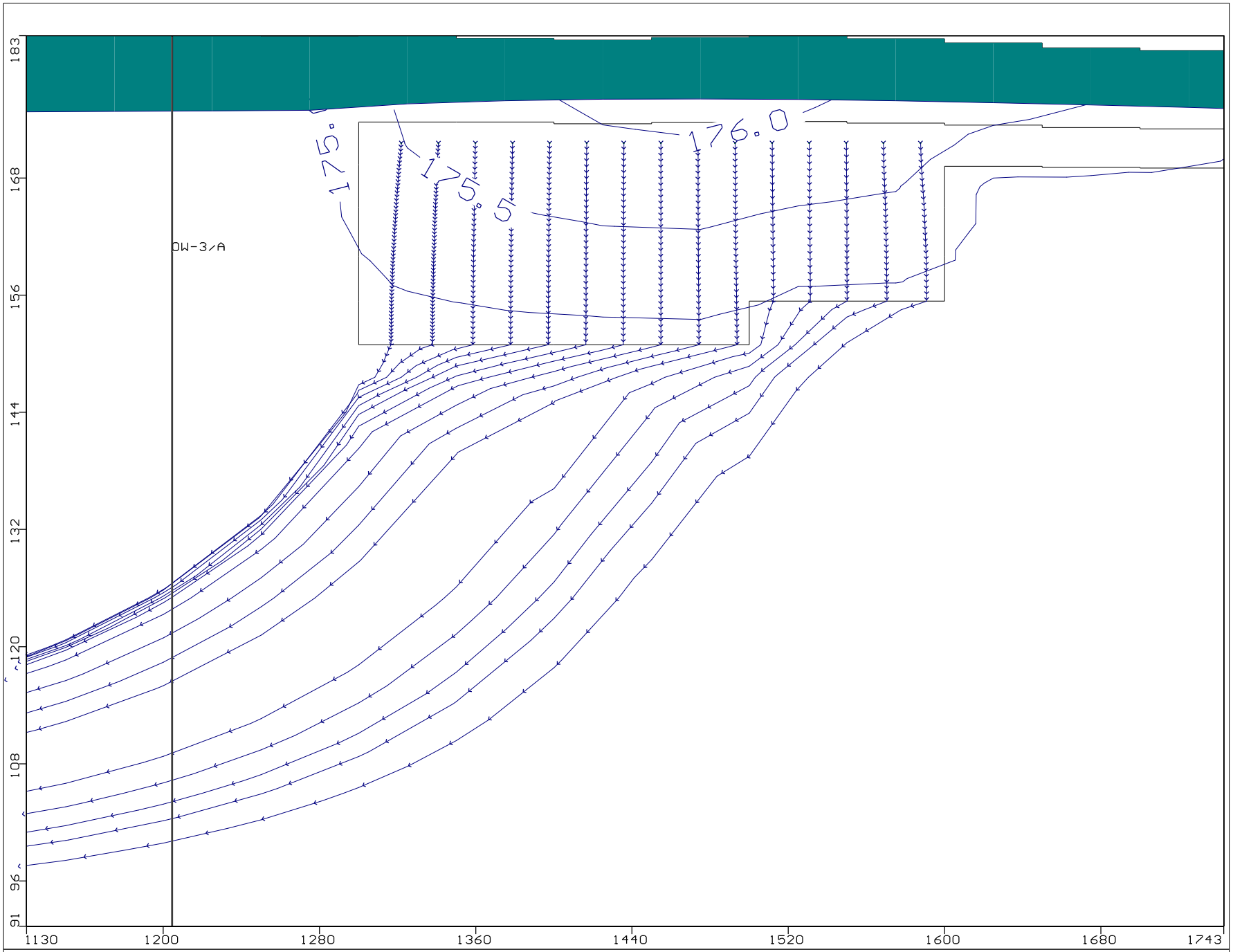


Figure 20



Quarry Flow Pathlines K = 0.001 ft/d

N

2-MILE RADIUS

1-MILE RADIUS

PACKER CREEK

1_MILE_NORTH

RAILROAD TRACKS

ROUTE 590

LICKERT-HARDER ROAD

OW-1

STONECO

OW-2

DOMESTIC

QUARRY CENTER

QUARRY

OW-3

OW-4

1_MILE_WEST

LICKERT_HARDER_RD

1_MILE_EAST

TOUSSAINT_NORTH_RD

TOUSSAINT NORTH ROAD

TOUSSAINT CREEK

MODEL DOMAIN BOUNDARY (VALUES IN METERS)

173.0

172.0

171.5

171.0

174.0

173.5

173.0

172.5

172.0

174.5

175.0

175.5

176.0

4300

3000

2400

1800

1200

600

0

0

700

1400

2100

2800

3500

4200

4900

5100

LEGEND

OBSERVATION WELL/LOCATION

WATER WELL (ODNR DATABASE)

Figure 21
Regional Flow Pathlines

0 500

APPROXIMATE SCALE (METERS)

Rocky Ridge Quarry Site
Graytown, Ohio

d/b: TLD | 07/2016

APPENDIX II
TABLES

TABLE 1
Model Input Parameters

Parameter	Value	Justification
Hydraulic Conductivity Surficial Clay Unit (K)	Kxy = 3.75 ft/day Kz = 0.375 ft/day	Arbitrary value, equal to underlying bedrock values; little interaction between groundwater and clay unit in model.
Hydraulic Conductivity Bedrock Units (K)	Kxy = 3.75 ft/day Kz = 0.375 ft/day	Best-fit value obtained through flow model calibration. Ratio of Kxy to Kz based on Visual Modflow defaults and estimated effects of horizontal unit stratification.
Porosity, Effective Porosity and Specific Yield	Porosity = 0.1 Eff. Porosity = 0.1 Spec. Yield = 0.1	Estimates within ranges given by Fetter (2001)[1].
Precipitation Recharge	Over Quarry = 33.38 in/yr Surrounding Area = 3.3 in/yr For rebound modeling, all recharge was set to background value of 3.3 in/yr.	Based on National Weather Service data and estimates of precipitation infiltration to bedrock aquifers; Site groundwater characteristics also assumed to be principally governed by area surface water boundaries.
Model Drain Conductance	250 m^2/day	Calibrated values.
Modeled Recovery (Dewatering) Well Pumping Rate (Q)	1,940 gpm	Field-measured value.
Constant Head Values		
Packer Creek	172 m (west) to 170.5 m (east)	Calibrated value.
Toussaint Creek	174.75 m (west) to 172.25 m (east)	Calibrated value.

[1] Fetter, C.W. (2001), Applied Hydrogeology, Prentice Hall, Inc.

HULL

RECORD OF GROUNDWATER MONITORING WELL DEVELOPMENT SHEET

Sheet 1 of ____

Facility: Rocky Ridge Quarry
Job No: RCRQ01
Developers: J. Ardner

Date: 3-15-16
Well No: OW-1

Date of Installaton: 3/9/16
Well Type: 2-inch PVC
Screen Interval: 33-115
Development Method: Grundfos pump
Water Quality Meter Used: Oakton

Borehole Size: 3.75"
Well Diameter: 2-inch

Initial Total Depth [a]: 118.42
Final Total Depth: 119.05
Initial Depth to Water: 23.27
Final Depth To Water: 23.36
Depth to NAPL [b]: N/A

Well Volume Calculation:	Gallons/Foot of Depth [c]	Feet of Standing Water	1 Well Volume (gallons)
	0.163 x	95.15 =	15.5

Time:	Pumping Rate	Vol. Purged (cumulative gallons)	DTW	Temp. (°C) (0.5)	pH (S.U.) (0.2)	Specific Cond. mS/cm (µS/cm) (3%)	ORP (Mv or ml/g)) (20)	Turbidity (NTU) (10%)	DO (mg/l) (10%)	Comments
1028		1.0 gal	23.55	12.7	6.83	1103		turbid		
1032	4 gpm	15 gal	23.55	11.9	7.05	1120		Sl. turbid		
1036	8 gpm	30 gal	23.55	12.0	7.09	1109		Clear		
1040		45 gal	23.55	12.0	7.07	1115		Clear		
1044		60 gal	23.55	12.1	7.05	1111		Clear		
1047		75 gal	23.55	12.0	7.05	1109		Clear		
1051		90 gal	23.55	12.0	7.04	1108		Clear		
1054		105 gal	23.55	12.0	7.04	1115		Clear		

a. Depths in Feet

b. NAPL - non-aqueous phase liquid

c. 1" well = 0.041, 1.5" well = 0.091, 2" well = 0.163, 4" well = 0.653, 6" well = 1.468

d. Stabilization Criteria, per OhioEPA TEGD 5/2012, adjust depending on State Program

HULL

RECORD OF GROUNDWATER MONITORING WELL DEVELOPMENT SHEET

Sheet 1 of 1

Facility: Rocky Ridge Quarry
Job No: RCK001
Developers: Jacob Ardner, James Carlson
Date: 3-15-2016
Well No: OW-2

Date of Installaton: 3/8/16
Well Type: 2-inch PVC
Screen Interval: 22-115'
Development Method: pump way grundfos
Water Quality Meter Used: Oakton

Borehole Size: 3.75-inch
Well Diameter: 2-inch

Well Volume Calculation:	Gallons/Foot of Depth [c]	Feet of Standing Water	1 Well Volume (gallons)
	0.163 x	81.59 =	13.3

Initial Total Depth [a]: 117.25
Final Total Depth: 118.56
Initial Depth to Water: 35.66
Final Depth To Water: 35.94
Depth to NAPL [b]: N/A

Time:	Pumping Rate	Vol. Purged (cumulative gallons)	DTW	Temp. (°C) (0.5)	pH (S.U.) (0.2)	Specific Cond. (uS/cm) (3%)	ORP (Mv or ml/g)) (20)	Turbidity (NTU) (10%)	DO (mg/l) (10%)	Comments
1336	4 gpm	3 gal		12.1	6.9	1119		Turbid		
1339		~14 gal	36.40	12.6	6.9	1114				1 volume
1342		28 gal	36.50	12.7	6.9	1118		Clear		2 volumes
1346		36 gal	36.55	12.7	7.0	1121				3 volumes
1352		50 gal	36.61	12.7	7.0	1118				4 volumes
1354		64 gal	36.65	12.8	7.0	1117		Clear		5 volumes

a. Depths in Feet
b. NAPL - non-aqueous phase liquid
c. 1" well = 0.041, 1.5" well = 0.091, 2" well = 0.163, 4" well = 0.653, 6" well = 1.468
d. Stabilization Criteria, per OhioEPA TEGD 5/2012, adjust depending on State Program

HULL

RECORD OF GROUNDWATER MONITORING WELL DEVELOPMENT SHEET

Sheet 1 of 1

Facility: Rocky Ridge Quarry
Job No: RCVL001
Developers: Jacob Andres / James Carlson
Date: 3-15-16
Well No: OW-3

Date of Installaton: 3/10/14
Well Type: 2-inch PVC
Screen Interval: 25 - 120'
Development Method: Pump w/ groundfos
Water Quality Meter Used: Oakton

Borehole Size: 3.75-inch
Well Diameter: 2-inch

Initial Total Depth [a]: ~~124.55~~ 122.53
Final Total Depth: 122.52
Initial Depth to Water: 36.62
Final Depth To Water: 36.90
Depth to NAPL [b]: none

	Gallons/Foot of Depth [c]	Feet of Standing Water	1 Well Volume (gallons)
Well Volume Calculation:	0.163 x	87.53 =	14.33

Time:	Pumping Rate	Vol. Purged (cumulative gallons)	DTW	Temp. (°C) (0.5)	pH (S.U.) (0.2)	Specific Cond. (uS/cm) (3%)	ORP (Mv or ml/g)) (20)	Turbidity (NTU) visual (10%)	DO (mg/l) (10%)	Comments
1150	4gpm	5 gal	37.52	12.3	7.09	876		Turb.d		Sulf. odor Static
1155		15 gal	37.50	12.5	7.17	920		turb.d		1 volume
1200		30 gal	37.55	12.7	7.17	932		Sl. turb.d		2 volumes
1204		45 gal	37.40	12.6	7.20	936		Sl. turb.d		3 volumes
1208		60 gal	37.65	12.5	7.22	945		Sl. turbid		4 volumes
1212		75 gal	37.69	12.6	7.25	945				5 volumes

a. Depths in Feet
b. NAPL - non-aqueous phase liquid
c. 1" well = 0.041, 1.5" well = 0.091, 2" well = 0.163, 4" well = 0.653, 6" well = 1.468
d. Stabilization Criteria, per OhioEPA TEGD 5/2012, adjust depending on State Program

HULL

RECORD OF GROUNDWATER MONITORING WELL DEVELOPMENT SHEET

Sheet 1 of 1

Facility: Rocky Ridge Quarry
Job No: RCKU01
Developers: J. Archer / J. Carlson

Date: 3-15-2016
Well No: OW-4

Date of Installaton: 3-11-16
Well Type: 2-inch PVC
Screen Interval: 15-115
Development Method: pump w/ groundfos
Water Quality Meter Used: Oakton

Borehole Size: 3.75-inch
Well Diameter: 2-inch

Initial Total Depth [a]: 117.58
Final Total Depth: 117.55
Initial Depth to Water: 26.03
Final Depth To Water: 26.44
Depth to NAPL [b]: N/A

Well Volume Calculation:	Gallons/Foot of Depth [c]		Feet of Standing Water		1 Well Volume (gallons)
	0.163	x	91.55	=	14.92

Time:	Pumping Rate	Vol. Purged (cumulative gallons)	DTW	Temp. (°C) (0.5)	pH (S.U.) (0.2)	Specific Cond. (uS/cm) (3%)	ORP (Mv or ml/g)) (20)	Turbidity (NTU) (10%)	DO (mg/l) (10%)	Comments
1458	4gpm	5gal		12.2	6.92	1306		Turbid		Turb. d
1502		15gal	27.38	12.8	7.01	1292				I volum
1503		30gal	27.55	12.9	7.01	1278		clear		
1507		45gal	27.65	12.8	7.01	1287				
1510		60gal	27.71	12.8	7.14	1283		clear		
1513		75gal	27.75	12.8	7.10	1282				

a. Depths in Feet
b. NAPL - non-aqueous phase liquid
c. 1" well = 0.041, 1.5" well = 0.091, 2" well = 0.163, 4" well = 0.653, 6" well = 1.468
d. Stabilization Criteria, per OhioEPA TEGD 5/2012, adjust depending on State Program

447245

HULL

GROUNDWATER SAMPLING FIELD DATA SHEET

Sheet 1 of 6

Facility: Rocky Ridge Quarry, Graytown OH
Address: SR 590
Job No: RCK001
Hull Personnel: J. Arduser

Well ID: OW-1
Date: 9-1-16
Weather: 75°F, sunny
Temp/Wind: 15 mph N
Barometric P: 30.07

MONITORING WELL DATA

Well Type: Observation well
Well Condition: new
Purge / Sample Method: low-flow
Type & Depth of Pump: Monsoon pump / ~75'
Water Quality Monitoring Equip Used: Horiba U-52

Depth of Water (ft[a]): 27.94
Total Depth (ft[a]): 119.05
Height of Water (ft): 91.11
Well Screen Interval (ft[a]):

WELL VOLUME CALCULATION:

Gallons/Foot of Depth[c]		Feet of Standing Water		1 Well Volume (gallons)
0.163	x	91.11	=	

PURGING DATA

Time:	Pumping Rate (ml/min)	Cumulative Volume (1 gal)	Depth to water (ft)[a] (0.3 max)[b]	Temp. (°C) (0.5)	pH (S.U.) (0.2)	Specific Cond. (uS/cm) (3%)	ORP (Mv or ml/g)) (20)	Turbidity (NTU) (10%)	DO (mg/l) (10%)	Comments
816	450 ml/min	Static	27.95	12.48	7.14	0.798	-45	0.0	16.11	
820	"		27.95	13.16	7.42	0.797	-47	0.0	14.10	Turbid
823	"		27.95	13.46	7.44	0.792	-53	7.00	13.29	
826	"		27.95	13.48	7.37	0.795	-56	2.50	12.24	Sl. turbid to clear
830	425 ml/min		27.95	13.49	7.34	0.789	-58	2.00	11.49	
833	"	1.0	27.95	13.52	7.33	0.788	-58	1.04	11.29	Clear, 1 gallon purged
836	"		27.95	13.54	7.31	0.785	-60	80.1	10.70	
840	"		27.95	13.55	7.31	0.783	-60	74.6	10.47	
844			27.95	13.56	7.32	0.782	-61	75.5	10.39	

SAMPLING DATA

SAMPLE ID	DATE	TIME	ANALYSIS	PRESERVED?	FIELD FILTERED? Y / N	FILTER SIZE
RCK001 : OW-1 : G090116	9-1-16	845		Y	N	

EXPLOSIVE GAS READING PRIOR TO STATIC WELL LEVEL:

PID Wellhead

%LEL:

a. Measurement from top of casing

b. Stabilization Criteria, per OhioEPA TEGD 5/2012, adjust depending on State Program.

c. 1" well = 0.041, 1.5" well = 0.091, 2" well = 0.163, 4" well = 0.653, 6" well = 1.468

NOTES:

HULL

GROUNDWATER SAMPLING FIELD DATA SHEET

Sheet 1 of 1

Facility: Rocky Ridge Quarry
Address: SR 590, Grayton, OH
Job No: RCK001
Hull Personnel: J. Ardner

Well ID: OW-2
Date: 9-1-16
Weather: Sunny
Temp/Wind: 80°F
Barometric P: 30.07"

MONITORING WELL DATA

Well Type: OW
Well Condition: New
Purge / Sample Method: low-flow
Type & Depth of Pump: monsoon, 73'
Water Quality Monitoring Equip Used: Horiba U-52

Depth of Water (ft[a]): 27.40
Total Depth (ft[a]): 118.56
Height of Water (ft):
Well Screen Interval (ft[a]):

WELL VOLUME CALCULATION:

Gallons/Foot of Depth[c]		Feet of Standing Water		1 Well Volume (gallons)
0.163	X	61.16	=	9.97

@1335 purged 2.0 gal, began low-flow

PURGING DATA

Time:	Pumping Rate (ml/min)	Cumulative Volume (l)	Depth to water (ft)[a] (0.3 max)[b]	Temp. (°C) (0.5)	pH (S.U.) (0.2)	Specific Cond. (uS/cm) (3%)	ORP (Mv or ml/g)) (20)	Turbidity (NTU) (10%)	DO (mg/l) (10%)	Comments
1340	500 ml/min	Static	Static	8.16	7.31	0.784	-44	>1000	1.33	heavy iron bacteria at water surface
1344	"		27.40	9.49	7.23	0.777	-49	"	1.30	
1347	"		27.40	9.22	7.22	0.784	-49	"	1.29	
1350	"		27.41	9.23	7.25	0.797	-45	"	1.13	
1353	"		27.40	9.25	7.24	0.798	-43	"	1.10	2nd
1357	"		27.40	9.23	7.23	0.800	-40	"	1.09	
1400	"	2.5 gal	27.40	9.22	7.24	0.801	-40		1.09	

SAMPLING DATA

SAMPLE ID	DATE	TIME	ANALYSIS	PRESERVED?	FIELD FILTERED? Y / N	FILTER SIZE
RCK001: OW-2 : G090116	9-1-16	1400		Y	N	

EXPLOSIVE GAS READING PRIOR TO STATIC WELL LEVEL:

PID Wellhead

0 %LEL:

a. Measurement from top of casing

b. Stabilization Criteria, per OhioEPA TEGD 5/2012, adjust depending on State Program.

c. 1" well = 0.041, 1.5" well = 0.091, 2" well = 0.163, 4" well = 0.653, 6" well = 1.468

NOTES:

HULL

GROUNDWATER SAMPLING FIELD DATA SHEET

Sheet 1 of 1

Facility: Rocky Ridge Quarry
Address: SR 590, Graytown, OH
Job No: RCR001
Hull Personnel: J. Ardner

Well ID: OW-3
Date: 9-1-16
Weather: 75°F
Temp/Wind: wind N 10 mph
Barometric P: 30.07"

MONITORING WELL DATA

Well Type: GW
Well Condition: New
Purge / Sample Method: low-flow
Type & Depth of Pump: Monsoon 85'
Water Quality Monitoring Equip Used: Horiba U-52

Depth of Water (ft[a]): 49.29
Total Depth (ft[a]): 122.50
Height of Water (ft):
Well Screen Interval (ft[a]):

WELL VOLUME CALCULATION:

Gallons/Foot of Depth[c]		Feet of Standing Water		1 Well Volume (gallons)
0.163	X	73.21	=	11.92

PURGING DATA

Time:	Pumping Rate (ml/min)	Cumulative Volume (l)	Depth to water (ft)[a] (0.3 max)[b]	Temp. (°C) (0.5)	pH (S.U.) (0.2)	Specific Cond. (uS/cm) (3%)	ORP (Mv or ml/g)) (20)	Turbidity (NTU) (10%)	DO (mg/l) (10%)	Comments
1440	500 ml/m		49.29	9.51	7.33	0.673	-54	7,000	1.35	
1444			49.30	10.02	7.09	0.669	-120	430	2.01	
1447			49.30	10.02	7.13	0.670	-140	105	2.03	
1450			49.30	10.00	7.15	0.672	-150	79.5	1.95	
1453			49.30	9.97	7.18	0.674	-154	74.2	1.97	
1456			49.29	9.95	7.20	0.680	-156	68.7	1.90	
1459			49.29	9.93	7.20	0.680	-160	73.1	1.87	
1502			4.29	9.92	7.20	0.680	-162	79.5	1.91	
1505		~2 gl	4.29	9.92	7.20	0.680	-164	72.1	1.94	

SAMPLING DATA

EXPLOSIVE GAS READING PRIOR TO STATIC WELL LEVEL:

_____ PID Wellhead

_____ %LEL:

SAMPLE ID	DATE	TIME	ANALYSIS	PRESERVED?	FIELD FILTERED? Y / N	FILTER SIZE
RCR001:OW-3:G090116	9-1-16	1505		Y	N	
RCR001:OW-3:G090116A						

a. Measurement from top of casing

b. Stabilization Criteria, per OhioEPA TEGD 5/2012, adjust depending on State Program.

c. 1" well = 0.041, 1.5" well = 0.091, 2" well = 0.163, 4" well = 0.653, 6" well = 1.468

NOTES: Dup. Sample Collected

HULL

GROUNDWATER SAMPLING FIELD DATA SHEET

Sheet 1 of 1

Facility: Rocky Ridge Quarry
Address: SR 590, Graytown, OH
Job No: RCK001
Hull Personnel: J. Ardner

Well ID: OW-4
Date: 9-1-16
Weather: Overcast
Temp/Wind: N. 10 mph
Barometric P: 30.07"

MONITORING WELL DATA

Well Type: OW
Well Condition: New
Purge / Sample Method: low-flow
Type & Depth of Pump: Monsoon ~77'
Water Quality Monitoring Equip Used: Horiba u52

Depth of Water (ft[a]): 38.50
Total Depth (ft[a]): 117.55
Height of Water (ft):
Well Screen Interval (ft[a]):

WELL VOLUME CALCULATION:

Gallons/Foot of Depth[c]		Feet of Standing Water		1 Well Volume (gallons)
0.163	x	79.05	=	12.88

PURGING DATA

Time:	Pumping Rate (ml/min)	Cumulative Volume (l)	Depth to water (ft)[a] (0.3 max)[b]	Temp. (°C) (0.5)	pH (S.U.) (0.2)	Specific Cond. (uS/cm) (3%)	ORP (Mv or ml/g)) (20)	Turbidity (NTU) (10%)	DO (mg/l) (10%)	Comments
1230	450ml/m	4500	38.50	9.50	7.21	1.03	-22	948	2.83	Sulfur odor
1233	" "		38.51	9.71	7.06	1.02	-35	950	1.84	Slightly turbid
1235	"		38.51	9.55	6.98	1.01	-43	890	1.94	
1238	" "		38.51	9.04	6.92	1.03	-41	462	1.12	" "
1241	500 ml/m	1.0 gal	38.51	8.53	6.88	1.04	-41	210	1.03	
1244	" "		38.51	8.73	6.87	1.04	-41	170	1.02	
1247	" "		38.51	8.71	6.86	1.04	-41	130	1.02	
1250	" "		38.51	8.69	6.85	1.04	-41	122	0.98	
1253	" "		38.51	8.65	6.84	1.04	-41	125	0.97	

SAMPLING DATA

SAMPLE ID	DATE	TIME	ANALYSIS	PRESERVED?	FIELD FILTERED? Y / N	FILTER SIZE
RCK001 : OW-4 : G090116	9-1-16	1255				

EXPLOSIVE GAS READING PRIOR TO STATIC WELL LEVEL:

PID Wellhead
%LEL:

a. Measurement from top of casing

b. Stabilization Criteria, per OhioEPA TEGD 5/2012, adjust depending on State Program.

c. 1" well = 0.041, 1.5" well = 0.091, 2" well = 0.163, 4" well = 0.653, 6" well = 1.468

NOTES:

HULL

GROUNDWATER SAMPLING FIELD DATA SHEET

Sheet _____ of _____

Well ID: Quarry

Facility: Rocky Ridge Quarry

Date: 9-1-16

Address: SR 590, Graytown, OH

Weather: Sunny

Job No: RCK001

Temp/Wind: 75°F

Hull Personnel: J Archer

Barometric P: 30.09"

MONITORING WELL DATA

Well Type: Quarry

Well Condition:

Purge / Sample Method:

Type & Depth of Pump: Monsoon 75.0'

Water Quality Monitoring Equip Used:

Depth of Water (ft[a]): 34.90 (in waves)

Total Depth (ft[a]): —

Height of Water (ft): —

Well Screen Interval (ft[a]):

WELL VOLUME CALCULATION:

Gallons/Foot of Depth[c] _______ X Feet of Standing Water _______ = 1 Well Volume (gallons) _______

PURGING DATA

Time:	Pumping Rate (ml/min)	Cumulative Volume (l)	Depth to water (ft)[a] (0.3 max)[b]	Temp. (°C) (0.5)	pH (S.U.) (0.2)	Specific Cond. (uS/cm) (3%)	ORP (Mv or ml/g)) (20)	Turbidity (NTU) (10%)	DO (mg/l) (10%)	Comments
1100	static			14.39	8.28	0.597	140	8.8	24.03	
1115				11.95	8.11		150	0.2	17.83	moved pump

SAMPLING DATA

EXPLOSIVE GAS READING PRIOR TO STATIC WELL LEVEL:

_______ PID Wellhead

_______ %LEL:

SAMPLE ID	DATE	TIME	ANALYSIS	PRESERVED?	FIELD FILTERED? Y / N	FILTER SIZE
Quarry	9-1-16	1115		Y	N	

a. Measurement from top of casing

b. Stabilization Criteria, per OhioEPA TEGD 5/2012, adjust depending on State Program.

c. 1" well = 0.041, 1.5" well = 0.091, 2" well = 0.163, 4" well = 0.653, 6" well = 1.468

NOTES:

HULL

GROUNDWATER SAMPLING FIELD DATA SHEET

Sheet ____ of ____

Facility: Rocky Ridge Quarry
Address: SR 590, Graytown, OH
Job No: RCR001
Hull Personnel: J. Ardner

Well ID: OF-1 Outfall
Date: 9-1-16
Weather: 75°F, Sunny
Temp/Wind:
Barometric P:

MONITORING WELL DATA

Well Type: Pump Lake Side
Well Condition: Quarry
Purge / Sample Method: -
Type & Depth of Pump:
Water Quality Monitoring Equip Used: Horiba U-52

Depth of Water (ft[a]):
Total Depth (ft[a]):
Height of Water (ft):
Well Screen Interval (ft[a]):

WELL VOLUME CALCULATION:

Gallons/Foot of Depth[c]		Feet of Standing Water		1 Well Volume (gallons)
_____	X	_____	=	_____

PURGING DATA

Time:	Pumping Rate (ml/min)	Cumulative Volume (l)	Depth to water (ft)[a] (0.3 max)[b]	Temp. (°C) (0.5)	pH (S.U.) (0.2)	Specific Cond. (uS/cm) (3%)	ORP (Mv or ml/g)) (20)	Turbidity (NTU) (10%)	DO (mg/l) (10%)	Comments
910				18.12	7.81	0.794	40	16.2	11.14	
911				18.15	7.80	0.793	42	16.1	11.20	
912				18.20	7.80	0.793	46	16.5	11.24	Collect Sample

SAMPLING DATA

SAMPLE ID	DATE	TIME	ANALYSIS	PRESERVED?	FIELD FILTERED? Y / N	FILTER SIZE
RCR001-OF-1-W090116	9-1-16	912	TSS	N	—	—

EXPLOSIVE GAS READING PRIOR TO STATIC WELL LEVEL:

PID Wellhead

%LEL:

a. Measurement from top of casing

b. Stabilization Criteria, per OhioEPA TEGD 5/2012, adjust depending on State Program.

c. 1" well = 0.041, 1.5" well = 0.091, 2" well = 0.163, 4" well = 0.653, 6" well = 1.468

NOTES:

APPENDIX C

Stormwater Management Plan

STORMWATER MANAGEMENT PLAN

DURING THE:

FILL (EMBANKMENT) ACTIVITIES FOR THE INTEGRATED ALTERNATIVE WASTE MANAGEMENT PLAN

LOCATED AT:

ROCKY RIDGE QUARRY
14591 W. TOUSSAINT N.
GRAYTOWN, OTTAWA COUNTY, OHIO

PREPARED FOR:

ROCKY RIDGE DEVELOPMENT, LLC.
3793 SILICA ROAD
SYLVANIA, OHIO 43560

PREPARED BY:

HULL & ASSOCIATES, INC.
3401 GLENDALE AVENUE, SUITE 300
TOLEDO, OHIO 43614

JULY 2016

HULL

TABLE OF CONTENTS

1.0 PROJECT DESCRIPTION

1.1 Background

Rocky Ridge Quarry (Site) is located at 14591 W. Toussaint North in Graytown, Ottawa County, Ohio. Current development on the site consists of an abandoned quarry and rural undeveloped farmland. Proposed quarry reclamation activities at the Site per the Integrated Alternative Waste Management Plan (IAWMP) include beneficially using spent lime by filling the quarry with Blended Fill (2 parts soil to 1 part decanted spent lime) up to surrounding grades, thereby reclaiming the quarry. Additionally, screening berm construction around the quarry has already commenced. The property is approximately 215 acres, and the quarry itself is approximately 38 acres. The quarry bench (northern portion of quarry) is approximately 21 acres.

Please reference the site-specific Storm Water Pollution Prevention Plan (SWP3) for additional stormwater management protocol. Also reference Attachment A for a map depicting existing conditions and drainage patterns associated with the beginning of the IAWMP.

1.2 Pre-Developed Conditions

The majority of the existing Site acreage is either farmfield or quarry. Drainage currently goes to either the quarry or overland flow to nearby roadside surface water ditches. The quarry contains a dewatering pump which discharges to a roadside ditch on OH-590 in accordance with the approved Individual National Pollutant Discharge Elimination System (NPDES) Permit (Permit No. 2IJ00104&AD, effective November 1, 2015). Currently, the quarry is dewatered to a level approximately forty (40) feet below surrounding farmfield grades which exposes the northern bench inside the quarry. Quarry water is hydraulically connected to groundwater.

1.3 Interim Construction Conditions

During the IAWMP Project, three (3) Phases of the work are proposed. Phase 1 includes filling the northern portion of the quarry, Phase 2 includes filling the southern portion of the quarry, and Phase 3 includes filling the entire quarry to surrounding grades. At the completion of each Phase, as well as during construction of each Phase, the Site Operator will construct stormwater management features including ditches, berms, check dams, all with varying drainage areas based on their current work areas within the quarry. The features should be constructed to protect existing quarry water from imported spent lime decant water during blending activities. However, stormwater runoff from the rest of the site, including over installed Blended Fill, may discharge to the quarry after passing through Best Management Practices (BMPs). Therefore, as construction progresses, it is imperative that the Operator consider and control stormwater and decant water appropriately, and separately.

A dewatering pump, capable of discharging 2.3 million gallons of water per day, is operated within the quarry and will be utilized as necessary to dewater the quarry to facilitate IAWMP activities. Therefore, there are no concerns with handling large storm events during Phase 1.

1.4 Post-Developed Conditions

Final grades for completion of IAWMP beneficial use activities (i.e., Phase 3) have yet to be designed and established. Permanent storm water control structures will be incorporated into the final design grades at that time. Temporary stormwater management controls have been incorporated into the Phase 1 Final Design Grades – refer to Sheet C6.0 of the Drawings within Appendix D of the IAWMP Application.

2.0 WATER QUALITY CONTROL

2.1 Initial Runoff Calculation

The existing drainage area flowing into the quarry is approximately 38 acres. Of this, 11 acres are the deep, southern end of the quarry, currently under water. The runoff coefficient for IAWMP work areas is 0.2 based on bare soil or agriculture. Based on the Precipitation Frequency Data Server on the NOAA website for Oak Harbor, Ohio (http://hdsc.nws.noaa.gov/hdsc/pfds), a 5-year, 30-minute rainfall intensity is 1.24 inches.

The Rational Method can be used to estimate flow rates for specific drainage areas at the Site. An simple, initial runoff calculation for the quarry bench during Phase 1 IAWMP construction is provided below as guidance, providing a peak flow rate in cubic feet per second (cfs):

$$Q = CiA$$

Q = Flow Rate (cfs)
C = Runoff Coefficient
i = Rainfall Intensity (inches) *(based on time of concentration. In this case, 30-minutes is used)*
A = Drainage Area (acres)

For a simple runoff calculation of peak flow for a 5-year storm event during Phase 1:

$$Q = 0.2 * 1.24 \text{ inches} * 27 \text{ acres} = \mathbf{6.7\ cfs}$$

As site conditions are expected to change drastically throughout the course of the IAWMP Project, this calculation should be used by the Site Operator as general guidance for construction stormwater management. For reference, this flow rate can be handled within a 1.5-foot deep triangular ditch with 2H:1V sideslopes and at least a 0.5% slope.

2.2 Site Specific SWP3

The Property has a site-specific Storm Water Pollution Prevention Plan (SWP3) combined for both Industrial and Construction Activities that aligns with the site's existing NPDES permit. Erosion control measures and BMP's should be followed based on the SWP3 and the IAWMP during construction activities.

2.3 Stormwater Controls

Temporary diversion berms and ditches will be required within the quarry during Blended Fill placement activities. The locations of these features will vary based on location of the work. Care must be taken to ensure lime decant water does not discharge directly to groundwater via the quarry water or fractures within the quarry bench. Rock letdowns, check dams, rock outlets, and riprap should be utilized as conditions dictate and local drainage areas change.

2.4 Sediment Traps

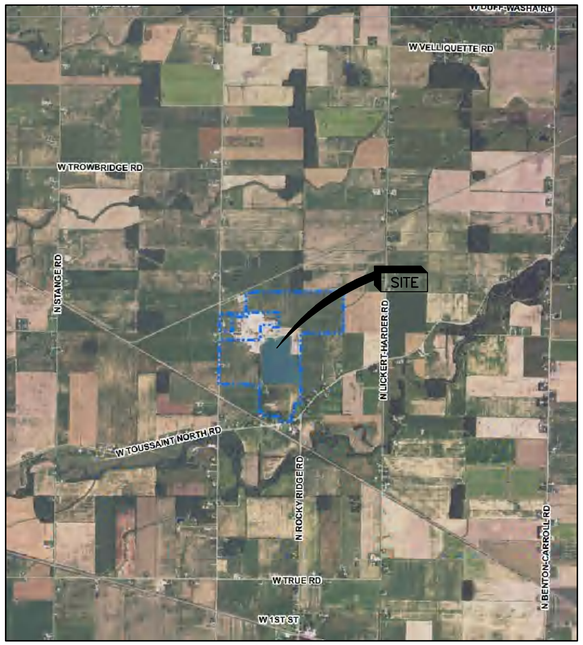
If necessary during construction, temporary sediment traps can be used to prevent sediment laden runoff from directly entering the quarry water. Drainage areas shall be limited five (5) acres or less to allow the sediment trap to efficiently filter out sediment. The sediment traps shall be sized in accordance with the Ohio Rainwater and Land Development Manual, which is provided in the site-specific SWP3. The volume of the traps are a minimum of 1800 cubic feet per acre of drainage plus 1000 cubic feet per disturbed acre within the drainage area of the trap.

APPENDIX D

Site Plans and Drawings

FILL PLAN FOR THE INTEGRATED ALTERNATIVE WASTE MANAGEMENT PLAN FOR ROCKY RIDGE QUARRY

GRAYTOWN, OTTAWA COUNTY, OHIO



LOCATION MAP

1 MILE 1/2 0 1 MILE

USGS QUAD: OAK HARBOR, OH
REV. 2015

VICINITY MAP

USGS QUAD: OAK HARBOR, OH
2015

INDEX TO SHEETS⚠

OWNER/OPERATOR:

ROCKY RIDGE DEVELOPMENT, LLC
3793 SILICA ROAD
SYLVANIA, OHIO 43560

ENGINEERING PLANS PREPARED BY:

HULL & ASSOCIATES, INC.
3401 GLENDALE AVE.
SUITE 300
TOLEDO, OHIO 43614
(419)385-2018

PRECONSTRUCTION NOTICE

These plans have been prepared using the most accurate information and data available at the time of preparation. Field conditions may be encountered during construction that could not be anticipated, and as such, these plans should be used only as a construction control reference, not a precise construction document. Modifications to the design as shown may be required based on field conditions at the time of construction. In any event the engineering objectives of the design will be met.

Ohio Utilities Protection Service
Call 811 before you dig
800-362-2764

OGPUPS
Ohio Oil & Gas Producers Underground Protection Service
800-925-0988

PRELIMINARY - NOT FOR CONSTRUCTION

HULL
BROWNFIELDS
SHALE OIL & GAS
WASTE MANAGEMENT
ENVIRONMENTAL
ALTERNATIVE ENERGY

3401 Glendale Ave.
Suite 300
Toledo, Ohio 43614

Phone: (419) 385-2018
Fax: (419) 385-5487
www.hullinc.com

Project Title:

FILL PLAN FOR THE INTEGRATED ALTERNATIVE WASTE MANAGEMENT PLAN FOR ROCKY RIDGE QUARRY

14591 W. TOUSSAINT N.
GRAYTOWN, OTTAWA COUNTY, OHIO

Owner:
ROCKY RIDGE DEVELOPMENT, LLC

3793 SILICA ROAD
SYLVANIA, OHIO 43560

Mark	Description	Date
⚠	UPDATE INDEX	08/30/16

Project No.:	RCK001
CAD DWG File:	RCK001.100.0008
Plot Date:	7/22/16
Layout By:	JAH
Drawn By:	SAH
Check By:	JAH/SDM
Scale:	AS NOTED
Issue Date:	JULY 2016

Sheet Title:
TITLE SHEET

Sheet Number: 1 OF 11
C1.0

HEALTH & SAFETY NOTES

1. THE OPERATOR SHALL DEVELOP, IMPLEMENT AND MAINTAIN CURRENT, A SITE-SPECIFIC HEALTH AND SAFETY PLAN (HASP). THE OPERATOR'S HASP, WHICH WILL ALSO INCLUDE THE OPERATOR'S CORPORATE HASP, WILL COMPLY WITH ALL OCCUPATIONAL HEALTH AND SAFETY ADMINISTRATION (OHSA) REQUIREMENTS, ANY SITE SPECIFIC HEALTH AND SAFETY REQUIREMENTS AND WILL BE UTILIZED BY THE OPERATOR AND THEIR SUBOPERATOR(S) FOR THE DURATION OF THE PROJECT.

2. THE OPERATOR SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH ALL FEDERAL, STATE AND LOCAL SAFETY REQUIREMENTS, INCLUDING THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970. THE OPERATOR SHALL ALWAYS EXERCISE PRECAUTION FOR THE PROTECTION OF PERSONS (INCLUDING EMPLOYEES) AND PROPERTY. IT SHALL ALSO BE THE SOLE RESPONSIBILITY OF THE OPERATOR TO INITIATE, MAINTAIN AND SUPERVISE ALL SAFETY REQUIREMENTS, PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK, INCLUDING THE EXCAVATION REQUIREMENT PER CFR 1926.650 SUBPART P.

GENERAL NOTES ⚠

1. THE OPERATOR SHALL NOTIFY THE OHIO EPA'S OFFICE TWO (2) DAYS PRIOR TO STARTING CONSTRUCTION.

2. THE OPERATOR SHALL BE RESPONSIBLE TO OBTAIN ALL NECESSARY LOCAL PERMITS AND SCHEDULING OF ALL INSPECTIONS.

3. THE OPERATOR SHALL CONFINE ACTIVITIES TO PROJECT LIMITS, EXISTING RIGHT-OF-WAYS, TEMPORARY EASEMENTS AND PERMANENT EASEMENTS, AND SHALL NOT ENTER UPON OTHER PROPERTIES WITHOUT WRITTEN PERMISSION OF THE OWNER.

4. EXISTING RIGHT-OF-WAYS, TEMPORARY EASEMENTS, AND PERMANENT EASEMENTS SHALL BE FIELD LOCATED BY THE OPERATOR TO ENSURE THEIR CORRECTNESS.

5. SHOULD WATER BE ENCOUNTERED WITHIN THE AREAS OF FILL, THE OPERATOR SHALL FURNISH AND OPERATE SUITABLE PUMPING EQUIPMENT OF SUCH CAPACITY ADEQUATE TO DEWATER. THE EXISTING QUARRY BENCH AT APPROXIMATE ELEVATION 552.0 SHALL BE SUFFICIENTLY DEWATERED SO THAT THE PLACEMENT OF BACKFILL IS MADE ON A SURFACE FREE OF STANDING WATER.

6. THE OPERATOR SHALL REFERENCE ALL IRON PINS AND MONUMENTS BEFORE EXCAVATING AT OR NEAR SAID IRON PINS OR MONUMENTS. IF ANY PINS OR MONUMENTS ARE DESTROYED OR DAMAGED BY THE OPERATOR, THEY SHALL BE ACCURATELY REPLACED BY A REGISTERED SURVEYOR IN THE STATE OF OHIO AT THE COMPLETION OF THE PROJECT, AT OPERATOR'S COST.

7. HORIZONTAL AND VERTICAL CONTROL SHALL BE ESTABLISHED BY THE OPERATOR FOR THE PROJECT. THE OPERATOR IS RESPONSIBLE FOR ALL REQUIRED SURVEYS TO COMPLETE THE PROJECT INCLUDING REESTABLISHMENT OF CONTROL POINTS, PROJECT LAYOUT, AND STAKING OF EASEMENTS.

8. DURING CONSTRUCTION, THE OPERATOR SHALL PROVIDE ADEQUATE DRAINAGE AND PROPER SOIL EROSION CONTROL MEASURES FOR PROTECTION OF ALL ADJACENT ROADS AND LANDS.

9. ANY MODIFICATION TO THE WORK AS SHOWN ON THESE DRAWINGS MUST HAVE PRIOR WRITTEN APPROVAL BY THE OWNER, REVIEW AGENCIES, AND ENGINEER.

10. THE OPERATOR IS RESPONSIBLE FOR PROVIDING SITE SECURITY DURING THE PROJECT, INCLUDING ANY MEANS NECESSARY TO ENSURE PROTECTION OF THE EQUIPMENT, MATERIALS, AND WORK.

11. THE OPERATOR SHALL PROVIDE THE QUALITY CONTROL MEASURES NECESSARY TO ENSURE THAT WORK HAS BEEN PERFORMED IN ACCORDANCE WITH THESE DRAWINGS, AND IN COMPLIANCE WITH THE IAWMP APPROVAL. THIS INCLUDES, BUT IS NOT LIMITED TO, CONSTRUCTION STAKING, VERIFICATION SURVEYING, AND SOIL COMPACTION. THE OPERATOR SHALL ALSO ASSIST THE ENGINEER IN THE COLLECTION OF SOIL SAMPLES, AS NEEDED, FOR SUBSEQUENT LABORATORY TESTING AS DIRECTED BY THE OWNER AND/OR ENGINEER.

12. ALL EXCAVATIONS SHALL COMPLY WITH OSHA CONSTRUCTION INDUSTRY STANDARDS REGARDING EXCAVATIONS, TRENCHING, SHORING AND BRACING. ALL EXCAVATIONS SHALL BE COMPLETED AND MAINTAINED IN A SAFE AND STABLE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD.

13. STORM WATER MANAGEMENT WILL BE COMPLETED IN SUCH A MANNER TO MINIMIZE THE POTENTIAL FOR UNAUTHORIZED LIQUIDS TO LEAVE THE SITE, AND TO PREVENT ANY DRINKING WATER TREATMENT MATERIAL (DWTM) DECANT WATER FROM ENTERING THE QUARRY. BMPS WILL ALSO BE EMPLOYED IN ACCORDANCE WITH THE ODNR'S RAINWATER AND LAND DEVELOPMENT MANUAL. BMPS WILL BE IMPLEMENTED WHEN APPROPRIATE TO MANAGE POTENTIAL RUNOFF AND DISPERSAL DURING ON-SITE STORAGE (I.E., BERM, SILT FENCE, ETC.).

14. PERMANENT AND TEMPORARY EROSION CONTROL FEATURES WILL BE INSTALLED AND MONITORED AS NECESSARY TO ASSURE EFFECTIVE AND CONTINUOUS EROSION CONTROL THROUGHOUT THE CONSTRUCTION AND POST-CONSTRUCTION PERIOD. ACTIVITIES WILL BE COMPLETED AS SPECIFIED IN THE STORM WATER POLLUTION PREVENTION PLAN (SWP3) FOR CONSTRUCTION ACTIVITIES OR OTHER NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REQUIREMENTS. THE SITE WILL BE GRADED TO DRAIN, AND THE BLENDING AND FILL AREAS WILL BE MAINTAINED TO PROMOTE POSITIVE DRAINAGE AND TO BE FREE OF STANDING WATER.

15. THE OPERATOR SHALL CONTINUALLY CONTROL GROUNDWATER AND/OR SURFACE WATER AS NECESSARY TO PERFORM THE CONSTRUCTION ACTIVITIES. THIS WORK INCLUDES CONSTRUCTING THE NECESSARY TEMPORARY DRAINAGE CHANNELS AND DIVERSIONS, AND FURNISHING, INSTALLING AND OPERATING ALL NECESSARY PUMPS, PIPING AND OTHER APPROPRIATE MEASURES NEEDED TO MAINTAIN THE SITE.

16. THE TRACKING OR SPILLAGE OF MUD, DIRT, OR DEBRIS UPON STATE, COUNTY, TOWNSHIP, OR CITY STREETS IS PROHIBITED AND ANY SUCH OCCURRENCE SHALL BE CLEANED UP IMMEDIATELY BY THE OPERATOR.

17. IT IS OPERATOR'S RESPONSIBILITY TO REVIEW ALL THE DRAWINGS AND SPECIFICATIONS PRIOR TO BEGINNING OF THE WORK AND INFORM THE OWNER IMMEDIATELY OF ANY DISCREPANCIES/ERRORS THAT ARE FOUND.

18. THE OPERATOR WILL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, PROCEDURES, AND TECHNIQUES.

19. IT IS NOT INTENDED THAT THESE DRAWINGS SHOW EVERY DETAIL THAT MAY BE REQUIRED FOR THE COMPLETION OF THIS PROJECT. COST OF OTHER WORK SHALL BE INCIDENTAL TO THE PROJECT.

20. TOPOGRAPHY WAS OBTAINED FROM READILY AVAILABLE PUBLIC LIDAR DATA ACCESSED THROUGH THE OHIO GEOGRAPHICALLY REFERENCED INFORMATION PROGRAM PROVIDED BY THE STATE OF OHIO ON MARCH 13, 2015. AERIAL PHOTO IS FROM GOOGLE EARTH DATED APRIL 22, 2016. CONTOUR LINES BELOW ELEVATION 560 ARE UNKNOWN.

TRAFFIC CONTROL NOTES

1. ALL WORK FOR THIS PROJECT IS TO TAKE PLACE ON PRIVATE PROPERTY. TRAFFIC ON PUBLIC ROADWAYS SHALL NOT BE IMPEDED IN ANY WAY. ANY WORK OR STAGING OF VEHICLES, MATERIAL OR EQUIPMENT THAT COULD HAVE AN IMPACT ON TRAFFIC MUST BE APPROVED, IN ADVANCE, BY THE OWNER, ENGINEER, AND COUNTY ENGINEER.

UTILITY NOTES

1. THE OPERATOR IS RESPONSIBLE FOR THE INVESTIGATION, LOCATION, SUPPORT, PROTECTION AND RESTORATION OF ALL EXISTING UTILITIES AND APPURTENANCES WHETHER SHOWN ON THESE PLANS OR NOT. THE OPERATOR SHALL EXPOSE ALL UTILITIES OR STRUCTURES PRIOR TO CONSTRUCTION TO VERIFY THE VERTICAL AND HORIZONTAL EFFECT ON THE PROPOSED CONSTRUCTION.

2. THE OPERATOR SHALL GIVE NOTICE OF INTENT TO CONSTRUCT TO OHIO UTILITIES PROTECTION SERVICE (TELEPHONE NUMBER 800-362-2764), AND TO THE OWNER OF THE UNDERGROUND UTILITIES THAT ARE NOT MEMBERS OF A REGISTERED UNDERGROUND PROTECTION SERVICE. NOTICE SHALL BE GIVEN AT LEAST 48 HOURS BEFORE START OF CONSTRUCTION.

3. THE OPERATOR SHALL GIVE NOTICE OF INTENT TO CONSTRUCT TO OIL AND GAS PRODUCERS UNDERGROUND PROTECTION SERVICE (TELEPHONE NUMBER 800-925-0988), AND TO THE OWNER OF THE OIL AND GAS COMPANIES IDENTIFIED WITHIN THE PROJECT AREA. NOTICE SHALL BE GIVEN AT LEAST 48 HOURS BEFORE START OF CONSTRUCTION.

DUST CONTROL NOTES ⚠

1. BEST MANAGEMENT PRACTICES (BMP) SHALL BE UTILIZED TO MINIMIZE DUST DURING LAND CLEARING/GRADING AND EMBANKMENT OPERATIONS. IMPLEMENT DUST CONTROL MEASURES WHEN DUST IS OBSERVED.

2. THE PRIMARY DUST CONTROL BMP IS WATERING AND MULCHING.

3. THE OPERATOR SHALL APPLY WATER AS NEEDED TO MINIMIZE BLOWING DUST. WATER SHOULD NOT BE ADDED TO THE DRINKING WATER TREATMENT MATERIAL (DWTM).

4. LOW VEHICULAR SPEEDS SHALL BE MAINTAINED ON-SITE TO MINIMIZE DUST.

5. STOCKPILES SHALL BE LOCATED TO PREVENT WIND EROSION.

6. TEMPORARY VEGETATIVE STABILIZATION SHALL BE COMPLETED WITHIN 14 DAYS, WHEN ANY AREA WILL BE DORMANT FOR MORE THAN 30 DAYS, AND PRIOR TO THE ONSET OF WINTER WEATHER. TEMPORARY VEGETATIVE STABILIZATION SHALL BE COMPLETED BY THE METHODS AND TIME SCHEDULES LISTED IN THE SITE'S SWP3.

BENEFICIAL USE NOTES: ⚠

1. APPROPRIATE STORMWATER CONTROLS AND BEST MANAGEMENT PRACTICES (BMPS) SHALL BE CONSTRUCTED AND ESTABLISHED PRIOR TO IMPORTING DWTM INTO THE QUARRY BENCH. ALL CONTACT WATER FROM THE SOIL-DWTM MATERIAL SHALL BE MANAGED APPROPRIATELY.

2. THE MANAGEMENT FOR THE BENEFICIAL USE OF THE DWTM ASSUMES THAT THE DWTM WILL BE STOCKPILED, DECANTED, BLENDED, AND EMBANKED IN VOLUMES THAT CAN BE PROPERLY AND RESPONSIBLY MANAGED BY THE OPERATOR ON A DAILY BASIS.

3. BENEFICIAL USE MATERIAL (BLENDED FILL) IS EXPECTED TO CONSIST OF A 67% SOIL AND 33% DWTM BY VOLUME; ALTERNATE BLEND MATERIALS/RATIOS USING HIGHER RATIO OF SOIL MAY BE CONSIDERED BY THE OPERATOR TO FACILITATE FILL PLACEMENT AND CONSTRUCTABILITY.

4. IT SHOULD BE NOTED THAT THERE HAS BEEN SIGNIFICANT DEWATERING, EXCAVATION, GRADING, AND OPERATIONAL ACTIVITIES AT THE FACILITY SINCE THE DEVELOPMENT OF THE EXISTING TOPOGRAPHY.

5. A PERIMETER SCREENING BERM CONSISTING AT DWTM AND SOIL BLEND IS CURRENTLY BEING INSTALLED PURSUANT TO THE OHIO EPA APPROVED LAMP AND ODNR RECLAMATION PLAN.

EARTHWORK AND QUARRY FILL PLACEMENT ⚠

1. QUARRY TO BE RECLAIMED WITH DWTM-SOIL BLEND AS DISCUSSED ON THIS SHEET. FOLLOWING DEWATERING OF THE QUARRY TO BELOW WORK AREAS, THE BLENDED MATERIAL WILL BE PLACED AND COMPACTED AS PREVIOUSLY DISCUSSED STARTING AT THE EXISTING QUARRY BENCH (AT AN APPROXIMATE ELEVATION OF 552.0 FT) UP TO A MAXIMUM ELEVATION OF 590.0 FT (PHASE 1). PHASES 2 AND 3 PROPOSE TO FILL THE REMAINDER OF THE QUARRY TO A MAXIMUM ELEVATION OF 617.5 FT.

2. PRIOR TO MATERIAL STORAGE OR PLACEMENT, SITE CLEARING SHOULD BE PERFORMED. LOOSE ROCK PILES WILL BE REMOVED FROM THE QUARRY. EXISTING HISTORICAL LIME MATERIAL FROM PREVIOUS QUARRY OPERATIONS MAY BE REMOVED, UTILIZED FOR BLENDING, OR LEFT IN PLACE IF IT CAN PROVIDE A SUITABLE SUBGRADE.

3. EMBANKMENT MATERIAL SHOULD BE PLACED ON A PREPARED, SUITABLE SUBGRADE. AT A MINIMUM, SUBGRADE SHOULD BE PROOF-ROLLED WITH A FULLY LOADED TANDEM-AXLE DUMP TRUCK (OR EQUIVALENT) TO IDENTIFY ANY SOFT/WEAK AREAS PRIOR TO EMBANKMENT PLACEMENT. SOFT/WEAK ZONES IDENTIFIED DURING THE PROOF-ROLL SHOULD BE UNDERCUT TO FIRM, STABLE CONDITIONS OR OTHERWISE STABILIZED PRIOR TO PLACEMENT OF FILL.

4. PROPOSED BLENDED FILL MAY CONSIST OF 33% DWTM (DEWATERED), AND 67% SOIL (BASED ON VOLUME). ON-SITE SOILS MAY BE USED. IF DWTM ARRIVES ONSITE TOO WET, THE WATER CONTENT OF THE DWTM SHOULD BE DEWATERED PRIOR TO MIXING WITH SOILS.

5. PROPOSED FILL SHOULD BE PLACED IN MAXIMUM 18" LOOSE LIFTS AND SHOULD BE COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY AT A MOISTURE CONTENT AT TO +3% ABOVE (O TO 3%) OPTIMUM MOISTURE CONTENT BASED ON MOISTURE-DENSITY RELATIONSHIP PER STANDARD PROCTOR (ASTM D698). BACKFILL SHALL HAVE A MAXIMUM CLOD SIZE OF 6 INCHES AND BE PLACED IN HORIZONTAL LAYERS. BACKFILL MATERIAL SHALL BE FREE OF TOPSOIL, ORGANIC OR OTHER DECOMPOSABLE MATTER, ROCKS HAVING A MAJOR DIMENSION GREATER THAN 12 INCHES, FROZEN SOIL, OR DEBRIS.

6. DWTM SHALL NOT BE PLACED IN WATER (E.G., WITHIN ABANDONED QUARRY) DURING STOCKPILING, BLENDING, OR PLACEMENT ACTIVITIES.

7. APPROPRIATE STORMWATER CONTROL BEST MANAGEMENT PRACTICES (BMPS) SHOULD BE USED DURING SOIL/DWTM MIXING. THESE INCLUDE INSTALLATION OF BERM, ROCK CHECK OUTLETS, SILT FENCE, FILTER SOCKS, SEDIMENT TRAPS, ETC., OF WHICH CAN BE FOUND IN THESE PLANS, THE ODNR RAINWATER AND LAND DEVELOPMENT MANUAL AND THE SITE SPECIFIC STORMWATER POLLUTION PREVENTION PLAN (SWP3). DECANT WATER FROM DWTM SHALL BE MANAGED SEPARATE FROM STORMWATER.

8. MAXIMUM INTERIM SLOPES OF BLENDED FILL MAY BE AT A 3.5H:IV HORIZONTAL TO VERTICAL GRADE. MAXIMUM FINAL SLOPES OF BLENDED FILL MAY BE UP TO A 3H:1V GRADE. MINIMUM FINAL SLOPES SHALL BE 2 PERCENT.

DRINKING WATER TREATMENT RESIDUALS ASSUMPTIONS ⚠

1. ANTICIPATE 90,000 CUBIC YARDS OF DWTM PER YEAR, OR 60 TRUCKLOADS PER WORK DAY.

2. ANTICIPATE DWTM TO AVERAGE 60% WATER, 40% SOLIDS. THIS EQUALS 36,000 CUBIC YARDS OF DWTM SOLIDS PER YEAR.

3. DWTM MOISTURE MAY NEED TO BE ADJUSTED (DEWATERED) PRIOR TO BLENDING WITH SOIL. UPON BLENDING WITH SOIL, DWTM SHOULD BE CONSIDERED RELATIVELY DRY (I.E,. NO EXCESS WATER).

4. DWTM SHALL BE THOROUGHLY MIXED BY APPROPRIATE MEANS/METHODS, USING 33% DWTM (DEWATERED) AND 67% SOILS (BASED ON VOLUME).

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Project Title:

FILL PLAN FOR THE INTEGRATED ALTERNATIVE WASTE MANAGEMENT PLAN FOR ROCKY RIDGE QUARRY

14591 W. TOUSSAINT N. GRAYTOWN, OTTAWA COUNTY, OHIO

Owner:
ROCKY RIDGE DEVELOPMENT, LLC

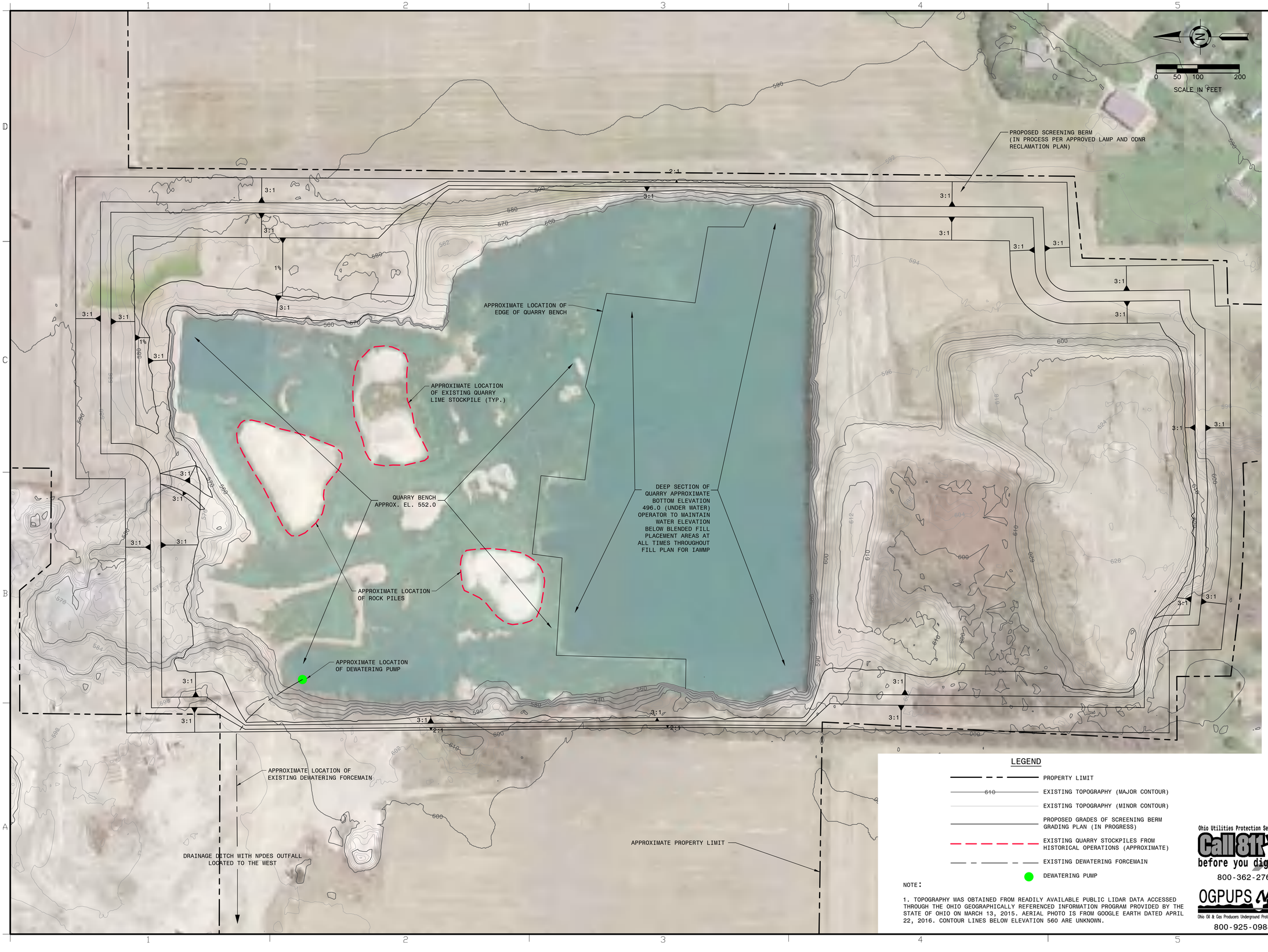
3793 SILICA ROAD
SYLVANIA, OHIO 43560

Mark	Description	Date
⚠	UPDATE NOTES	08/30/16

Project No.:	RCK001
CAD DWG File:	RCK001.100.0009
Plot Date:	7/22/16
Layout By:	JAH
Drawn By:	SAH
Check By:	JAH/SDM
Scale:	AS NOTED
Issue Date:	JULY 2016

Sheet Title:
GENERAL NOTES

Sheet Number: 2 OF 11
C2.0



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LEGEND

- PROPERTY LIMIT
- EXISTING TOPOGRAPHY (MAJOR CONTOUR)
- EXISTING TOPOGRAPHY (MINOR CONTOUR)
- PROPOSED GRADES OF SCREENING BERM GRADING PLAN (IN PROGRESS)
- EXISTING QUARRY STOCKPILES FROM HISTORICAL OPERATIONS (APPROXIMATE)
- EXISTING DEWATERING FORCEMAIN
- DEWATERING PUMP

NOTE:

1. TOPOGRAPHY WAS OBTAINED FROM READILY AVAILABLE PUBLIC LIDAR DATA ACCESSED THROUGH THE OHIO GEOGRAPHICALLY REFERENCED INFORMATION PROGRAM PROVIDED BY THE STATE OF OHIO ON MARCH 13, 2015. AERIAL PHOTO IS FROM GOOGLE EARTH DATED APRIL 22, 2016. CONTOUR LINES BELOW ELEVATION 560 ARE UNKNOWN.

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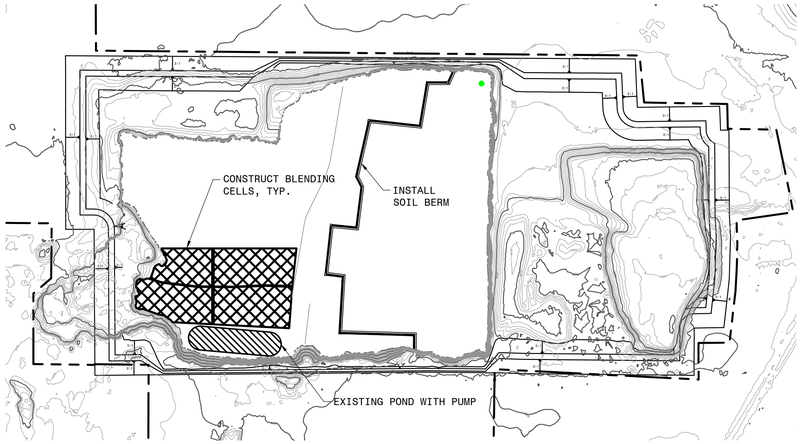
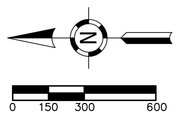
Scale:	1"=100'
Issue Date:	JULY 2016

Sheet Title:
EXISTING SITE PLAN

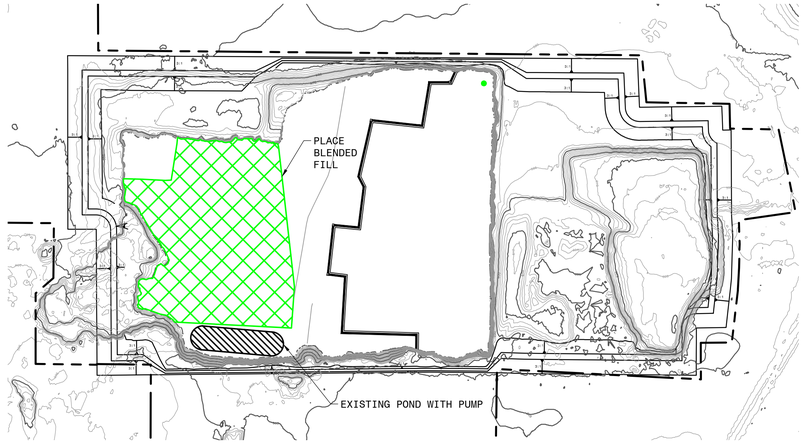
Sheet Number: 3 OF 11
C3.0

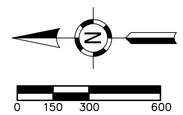




PHASE 1-A ⚠

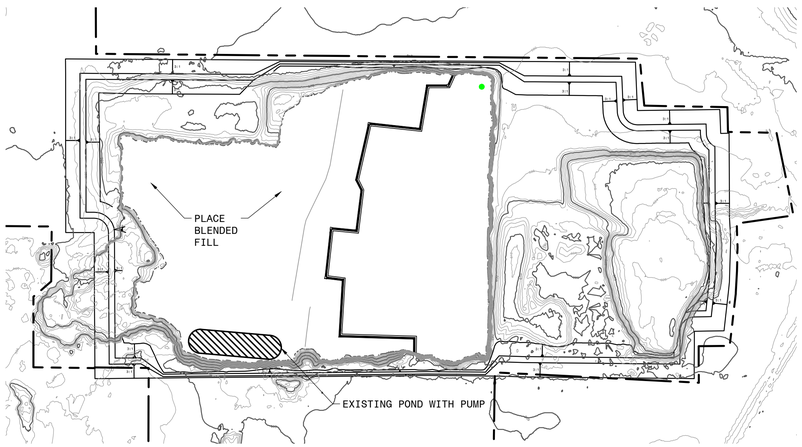
1. ACHIEVE AND MAINTAIN WATER ELEVATION IN QUARRY BELOW QUARRY BENCH (i.e, BENCH AT ~ELEV. 552.0 FT.) TO FACILITATE OPERATIONS.
2. INSTALL EROSION AND SEDIMENT CONTROL STRUCTURES AS NECESSARY.
3. COMPLETE INSTALLATION OF PERIMETER SCREENING BERM AND SUBMIT FINAL RECLAMATION DOCUMENTATION TO ODNR.
4. INSTALL DIVERSION SOIL BERM ALONG EDGE OF QUARRY BENCH.
5. CLEAR AND GRADE QUARRY BENCH TO PROVIDE SUITABLE SUBGRADE FOR BLENDED FILL PLACEMENT, AS NECESSARY, AND PERFORM UPDATED TOPOGRAPHIC SURVEY.
6. INSTALL BLENDING CELLS AS NEEDED (1-ACRE EACH, TYP.):
   A. REMOVE EXISTING QUARRY LIME STOCKPILES FROM PREVIOUS QUARRY OPERATIONS TO COMPETENT SUBGRADE.
   B. INSTALL 3-FOOT THICK BLENDED FILL OR SOIL LINER, SLOPED TO PROMOTE POSITIVE DRAINAGE.
   C. INSTALL APPROXIMATE 6-FOOT TALL SOIL BERMS.
   D. INSTALL METHOD TO REMOVE DECANT WATER (CULVERT WITH VALVE, PORTABLE PUMP, ETC.) FROM BLENDING CELLS

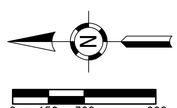




PHASE 1-B ⚠

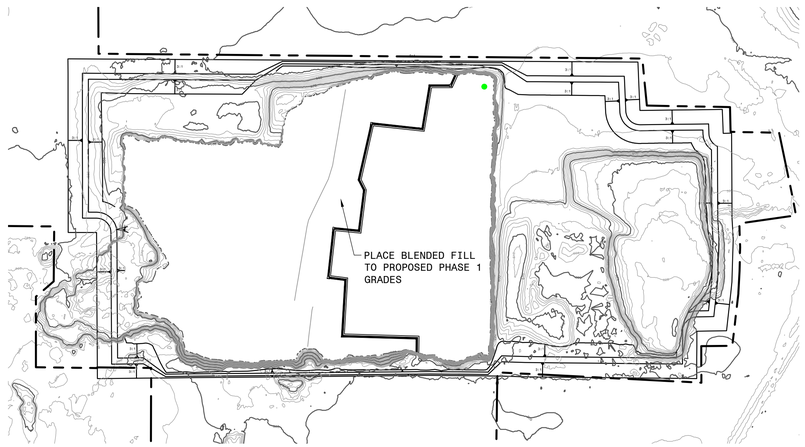
1. IMPORT SPENT DWTM AND PERFORM BLENDING ACTIVITIES WITHIN THE LINED BLENDING CELLS INSIDE THE QUARRY.
2. INSTALL BLENDED FILL WITHIN THE NORTHERN PORTION OF THE QUARRY, AS SHOWN.
   A. NOTE, NORTHEAST CORNER OF QUARRY IS DEEP AND SHOULD NOT BE FILLED UNTIL PHASE 1-C.
   B. PLACE BLENDED AGAINST VERTICAL QUARRY WALL.
   C. INSTALL NEW BLENDING CELLS, AS NEEDED, WITHIN PHASE 1-B FILL AREA.
3. CONTINUE TO REMOVE DECANT WATER FROM BLENDING CELLS, AS NEEDED.
4. MAINTAIN WATER ELEVATION IN QUARRY BELOW QUARRY BENCH.

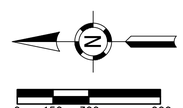




PHASE 1-C

1. RELOCATE PUMP IN EXISTING POND TO ALLOW WATER LEVEL TO BE LOWERED AN ADDITIONAL APPROXIMATE 20 FEET AND MAINTAIN.
2. CREATE LINED BLENDING CELLS AND CONTINUE BLENDING ACTIVITIES.
3. INSTALL BLENDED FILL WITHIN THE NORTHEAST CORNER AND THE SOUTHERN PORTIONS OF THE QUARRY BENCH.
4. CONTINUE TO REMOVE DECANT WATER FROM BLENDING CELLS.





PHASE 1-D ⚠

1. RELOCATE PUMP TO SOUTHEAST CORNER OF QUARRY, WITHIN THE DEEP END. MAINTAIN OR LOWER WATER ELEVATION.
2. CREATE BLENDING CELLS AND CONTINUE BLENDING ACTIVITIES.
3. CONTINUE TO PLACE BLENDED FILL IN NORTHERN PORTION OF QUARRY. USE PORTABLE PUMP TO REMOVE WATER AND PUMP TO NPDES DRAINAGE DITCH, AS NECESSARY.
4. INSTALL BLENDED FILL AS NEEDED TO ACHIEVE FINAL PHASE 1 GRADES.
5. INSTALL FINAL PHASE 1 DRAINAGE AND EROSION CONTROL STRUCTURES.

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14591 W. TOUSSAINT N. GRAYTOWN, OTTAWA COUNTY, OHIO

Owner:
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3793 SILICA ROAD
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Mark	Description	Date
⚠	UPDATE	08/30/16

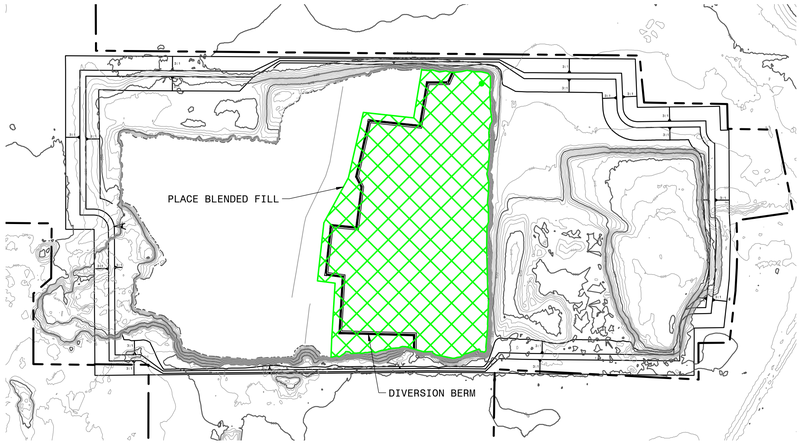
Project No.:	RCK001
CAD DWG File:	RCK001.100.0010
Plot Date:	7/22/16
Layout By:	JAH
Drawn By:	SAH
Check By:	JAH/SDM
Scale:	1"=100'
Issue Date:	JULY 2016

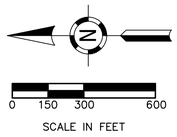
Sheet Title:
PHASING PLAN

(1 OF 2)

Sheet Number: 4 OF 11

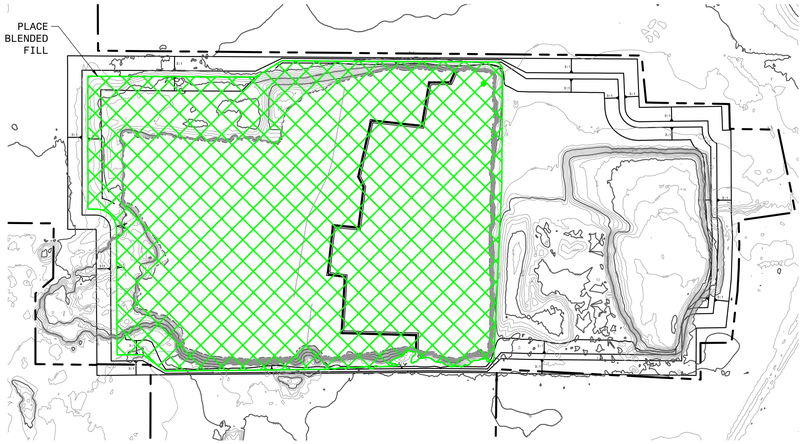
C4.0

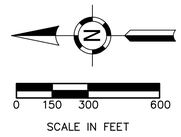




PHASE 2 ⚠

1. DEWATER DEEP SOUTHERN PORTION OF QUARRY AND MAINTAIN.
2. PREPARE SUBGRADE AND INSTALL 3 FT. BLENDED SOIL LAYER WITHIN PROPOSED BLENDING CELLS.
3. PERFORM BLENDING ACTIVITIES AND PLACE BLENDED FILL IN DEEP PORTION (SOUTHERN) OF QUARRY.
4. REMOVE DIVERSION BERM AND PLACE BLENDED FILL WHILE KEYING INTO PHASE 1 FILL.





PHASE 3 ⚠

1. PERFORM BLENDING ACTIVITIES AND INSTALL BLENDED FILL TO FINAL DESIGN GRADES.
2. INSTALL PERMANENT STORMWATER CONTROL FEATURES.

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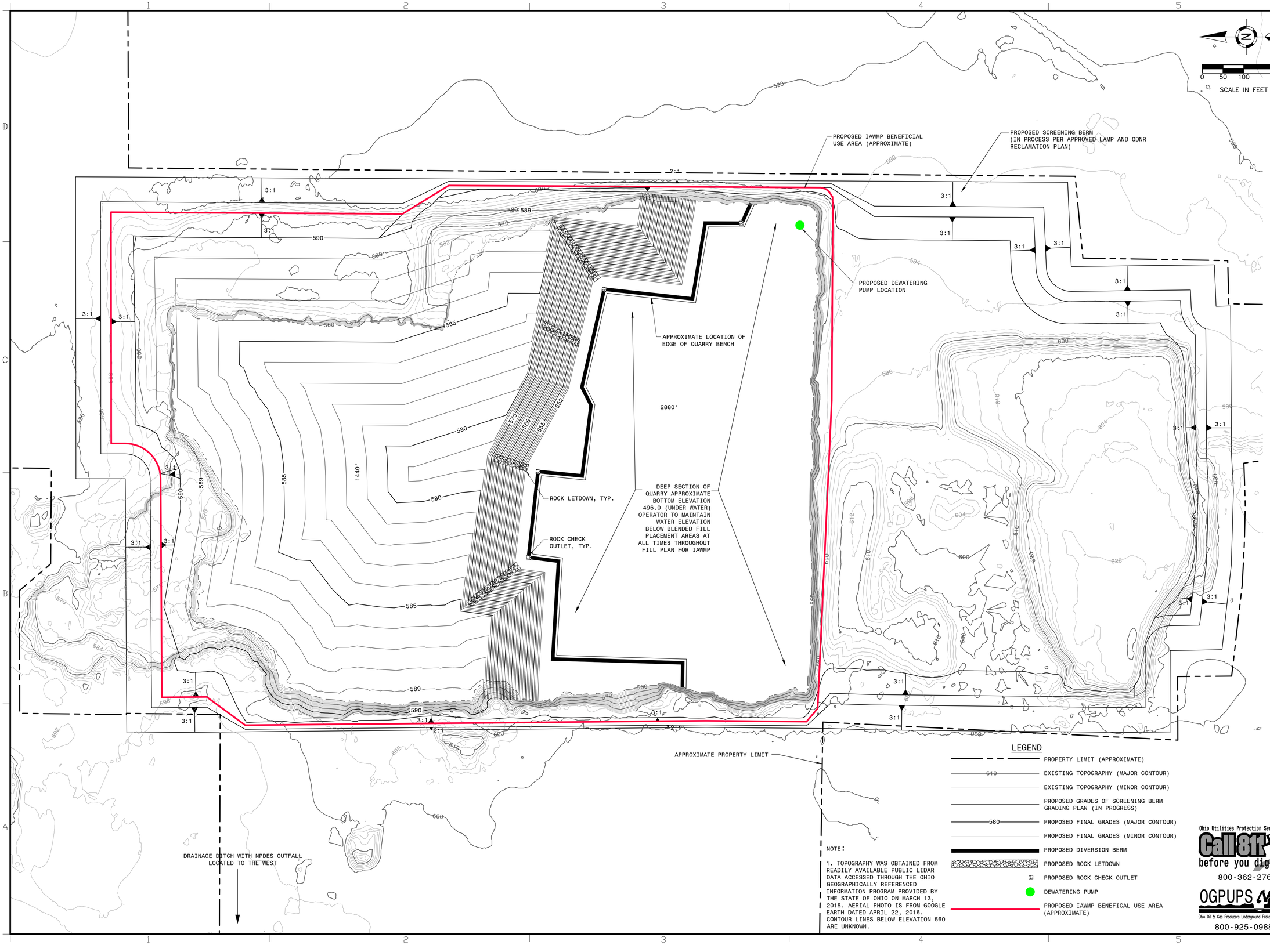
Sheet Title:
PHASING PLAN

(2 OF 2)

Sheet Number: 5 OF 11

C4.1



LEGEND

- PROPERTY LIMIT (APPROXIMATE)
- EXISTING TOPOGRAPHY (MAJOR CONTOUR)
- EXISTING TOPOGRAPHY (MINOR CONTOUR)
- PROPOSED GRADES OF SCREENING BERM GRADING PLAN (IN PROGRESS)
- PROPOSED FINAL GRADES (MAJOR CONTOUR)
- PROPOSED FINAL GRADES (MINOR CONTOUR)
- PROPOSED DIVERSION BERM
- PROPOSED ROCK LETDOWN
- PROPOSED ROCK CHECK OUTLET
- DEWATERING PUMP
- PROPOSED IAWMP BENEFICAL USE AREA (APPROXIMATE)

NOTE:

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Sheet Title:
PROPOSED FINAL GRADES

(PHASE 1)

Sheet Number: 6 OF 11
C5.0

PROPOSED IAWMP BENEFICIAL USE AREA (APPROXIMATE)

PROPOSED SCREENING BERM (IN PROCESS PER APPROVED LAMP AND ODNR RECLAMATION PLAN)

APPROXIMATE LOCATION OF EDGE OF QUARRY BENCH

LOW POINT ELEV.= 570'

2880'

1440'

APPROXIMATE PROPERTY LIMIT

DRAINAGE DITCH WITH NPDES OUTFALL LOCATED TO THE WEST

0 50 100 200
SCALE IN FEET

LEGEND

- PROPERTY LIMIT (APPROXIMATE)
- 610 EXISTING TOPOGRAPHY (MAJOR CONTOUR)
- EXISTING TOPOGRAPHY (MINOR CONTOUR)
- PROPOSED GRADES OF SCREENING BERM GRADING PLAN (IN PROGRESS)
- 580 PROPOSED FINAL GRADES (MAJOR CONTOUR)
- PROPOSED FINAL GRADES (MINOR CONTOUR)
- PROPOSED IAWMP BENEFICAL USE AREA (APPROXIMATE)

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Sheet Title:
PROPOSED FINAL GRADES

(PHASE 2)

Sheet Number: 7 OF 11
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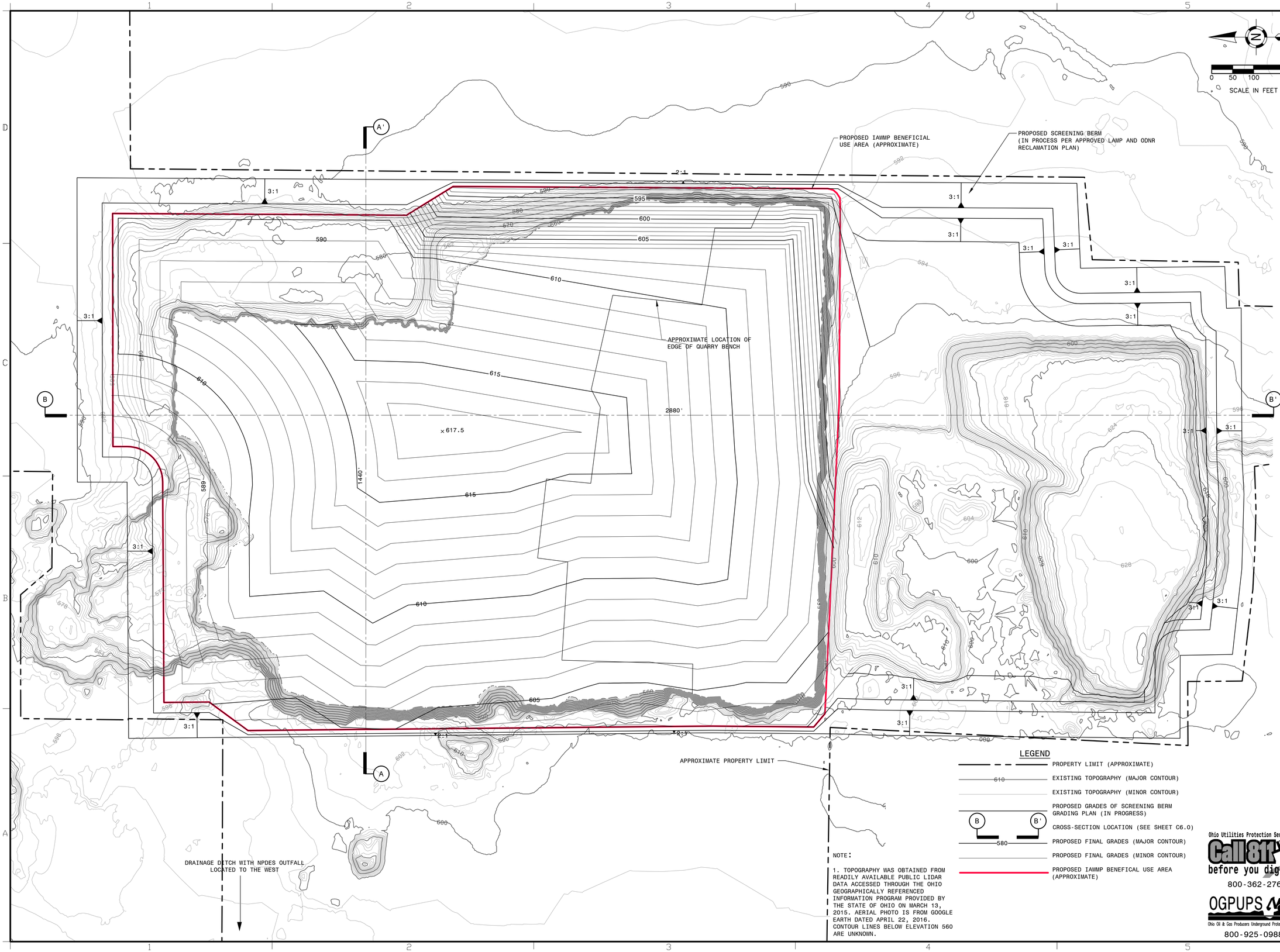

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- EXISTING TOPOGRAPHY (MINOR CONTOUR)
- PROPOSED GRADES OF SCREENING BERM GRADING PLAN (IN PROGRESS)
- CROSS-SECTION LOCATION (SEE SHEET C6.0)
- PROPOSED FINAL GRADES (MAJOR CONTOUR)
- PROPOSED FINAL GRADES (MINOR CONTOUR)
- PROPOSED IAWMP BENEFICAL USE AREA (APPROXIMATE)

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(PHASE 3)

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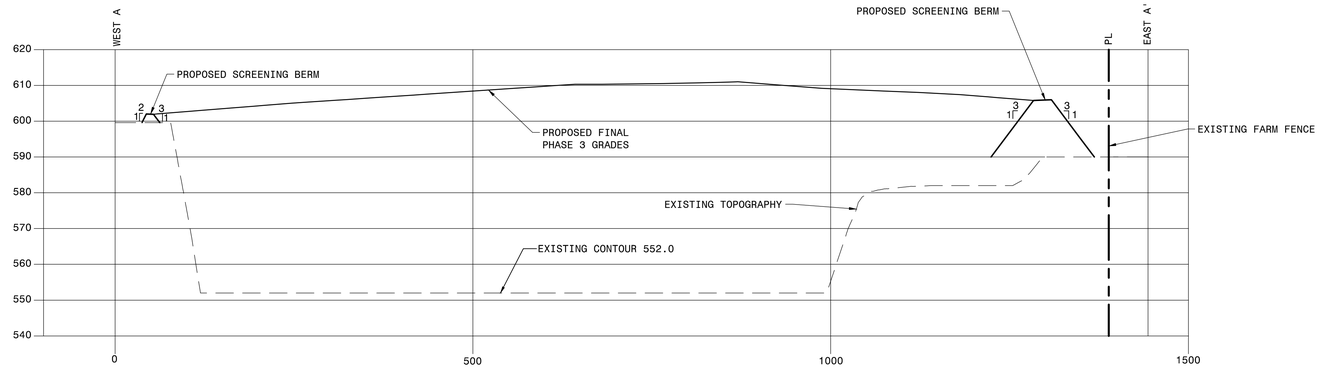
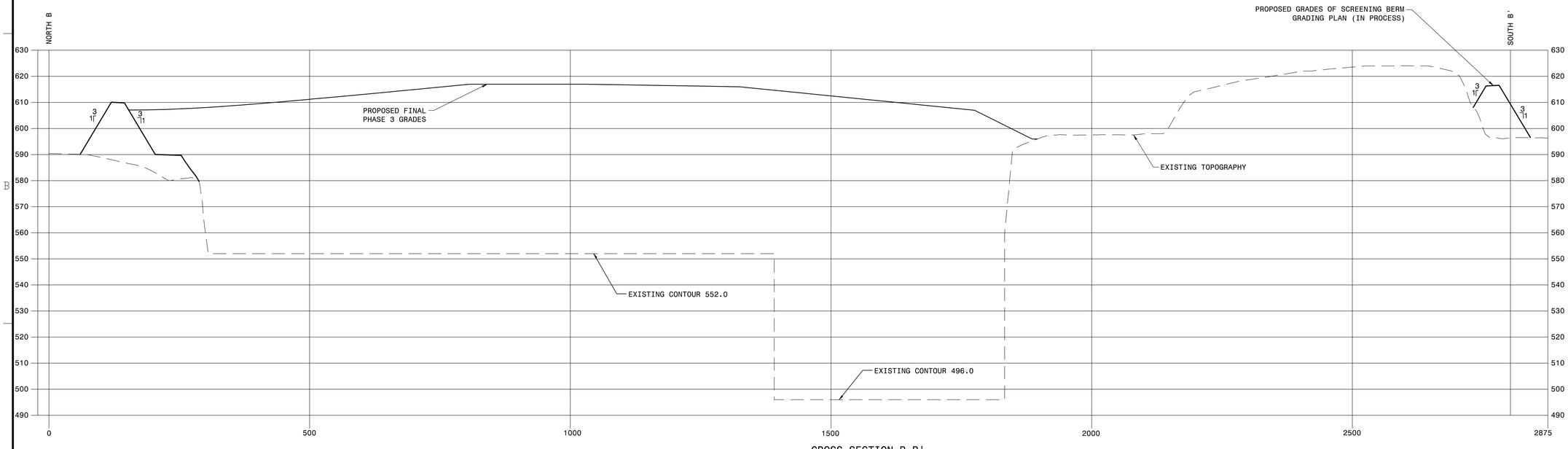
C5.2



CROSS-SECTION A-A'
HOR. SCALE - 1"=100'
VERT. SCALE - 1"=20'



CROSS-SECTION B-B'
HOR. SCALE - 1"=100'
VERT. SCALE - 1"=20'

NOTE:

EXISTING GRADES FOR BOTTOM OF QUARRY ARE APPROXIMATE AND WERE ESTIMATED FROM STONECO'S IM-320 30-YR RENEWAL SUBMITTAL TO ODNR.

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Project Title:

FILL PLAN FOR THE INTEGRATED ALTERNATIVE WASTE MANAGEMENT PLAN FOR ROCKY RIDGE QUARRY

14591 W. TOUSSAINT N.
GRAYTOWN, OTTAWA COUNTY, OHIO

Owner:
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3793 SILICA ROAD
SYLVANIA, OHIO 43560

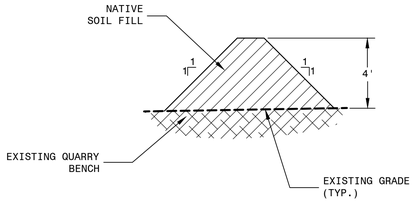
Mark	Description	Date
1	UPDATE	08/30/16

Project No.:	RCK001
CAD DWG File:	RCK001.100.0010
Plot Date:	7/22/16
Layout By:	JAH
Drawn By:	SAH
Check By:	JAH/SDM
Scale:	AS NOTED
Issue Date:	JULY 2016

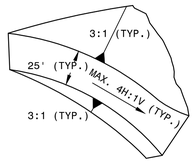
Sheet Title:
CROSS-SECTIONS

(FINAL PHASE 3)

Sheet Number: 9 OF 11
C6.0



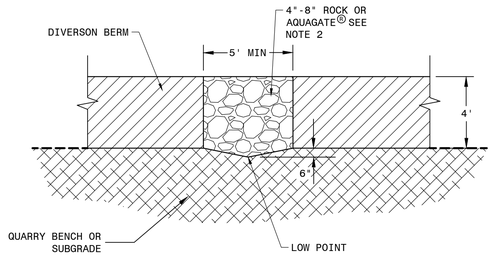
1 DIVERSION BERM DETAIL
SCALE: 1"=4'



2 PROPOSED HAUL ROAD GEOMETRY DETAIL
SCALE: N.T.S.

NOTE:

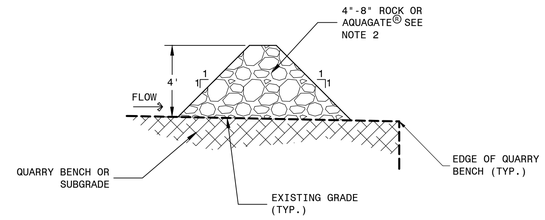
HAUL ROADS TO BE CONSTRUCTED AT A MAXIMUM 4:1 ROADWAY GRADE TO PROVIDE INGRESS/EGRESS FROM THE QUARRY

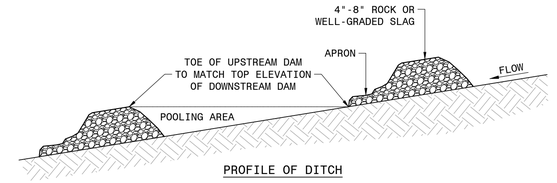


3 ROCK CHECK OUTLET
SCALE: 1"=4'

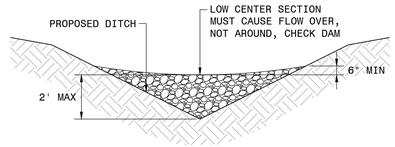
NOTES:

1. INSTALL ROCK CHECK OUTLETS AS NEEDED WITHIN THE DIVERSION BERM AT LOW POINTS ON THE EDGE OF THE QUARRY BENCH, OR WITHIN BLENDING AREA BERM.
2. IF UTILIZED, AQUAGATE© WILL REQUIRE A STUDY AND/OR DESIGN TO DETERMINE PROPER DIMENSIONS FOR CONTAMINANT REMOVAL.





PROFILE OF DITCH



CROSS-SECTION OF DITCH

DAM HEIGHT	CHECK DAM SPACING *		
	CHANNEL SLOPE		
	1%	5%	10%
1'	100'	20'	10'
2'	200'	40'	20'

* SEE NOTE 5 FOR ADDITIONAL CHECK DAM SPACING GUIDANCE.

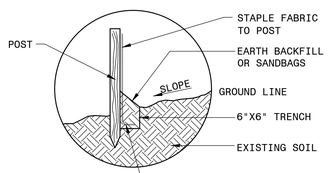
4 CHECK DAM DETAIL
SCALE: N.T.S.

NOTES:

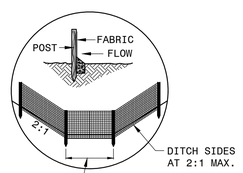
1. INSTALL ROCK CHECK DAMS AS NEEDED WITHIN SWALES TO REDUCE THE VELOCITY OF CONCENTRATED FLOWS TO REDUCE EROSION IN THE SWALES.
2. DAM MUST HAVE A LOW CENTER SECTION PRESENT TO ALLOW FLOW OVER, NOT AROUND, CHECK DAM.
3. APRON SHOULD BE PLACED DOWNSTREAM OF CHECK DAM AND SHALL BE 6" THICK AND ITS LENGTH TWICE THE HEIGHT OF THE DAM.
4. CHECK DAM CONSTRUCTION SHALL BE IN ACCORDANCE WITH CHAPTER 5 OF THE ODNR RAINWATER MANUAL.
5. SPACING OF CHECK DAMS SHALL BE IN A MANNER SUCH THAT THE TOE OF THE UPSTREAM DAM IS AT THE SAME ELEVATION AS THE TOP OF THE DOWNSTREAM DAM.

EROSION AND SEDIMENTATION CONTROL NOTES:

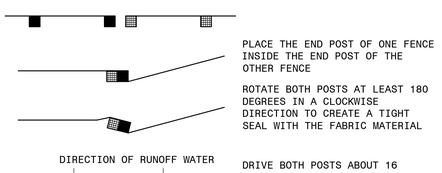
1. DURING CONSTRUCTION THE CONTRACTOR SHALL PROVIDE PROPER SOIL EROSION MEASURES FOR PROTECTION OF ALL ADJACENT ROADS, LANDS AND STREAMS AS DESCRIBED BY THE CURRENT APPLICABLE FEDERAL, STATE OR LOCAL REQUIREMENTS.
2. THE CONTRACTOR SHALL PROVIDE SEDIMENT CONTROL AT 1) ALL POINTS WHERE PROJECT WATERS LEAVE THE LIMITS OF THE PROJECT, 2) ALL POINTS WHERE PROJECT WATERS ENTER PORTIONS OF COMPLETED UNDERGROUND PIPING AND 3) AROUND ANY AREA DESIGNATED FOR SOIL STOCKPILING OR MATERIAL STAGING. ACCEPTED METHODS OF PROVIDING EROSION/SEDIMENT CONTROL INCLUDE BUT ARE NOT LIMITED TO: EROSION CONTROL BLANKET, SEDIMENT BASINS, SILT FENCE, TEMPORARY GROUND COVER.
3. ANY DISTURBED AREA WITHIN 50 FEET OF A STREAM AND NOT AT FINAL GRADE SHALL HAVE TEMPORARY EROSION CONTROLS WITHIN 2 DAYS OF THE MOST RECENT DISTURBANCE IF THE AREA WILL REMAIN IDLE FOR MORE THAN 21 DAYS.
4. ANY DISTURBED AREAS NOT WITHIN 50 FEET OF A STREAM THAT WILL BE DORMANT FOR MORE THAN 21 DAYS, BUT LESS THAN ONE YEAR, SHALL HAVE TEMPORARY EROSION CONTROLS APPLIED WITHIN 7 DAYS OF THE MOST RECENT DISTURBANCE TO THE AREA.
5. IF AREAS WILL LIE DORMANT OVER THE WINTER, TEMPORARY EROSION CONTROLS SHALL BE APPLIED PRIOR TO THE ONSET OF WINTER.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL OF ALL TEMPORARY SEDIMENT DEVICES AT THE CONCLUSION OF CONSTRUCTION BUT NOT BEFORE GROWTH OF PERMANENT GROUND COVER.
7. IF AREAS WILL LIE DORMANT FOR ONE YEAR OR MORE, PERMANENT EROSION CONTROLS SHALL BE APPLIED WITHIN 7 DAYS OF THE MOST RECENT DISTURBANCE.
8. FOR ANY AREA WITHIN 50 FEET OF A STREAM AND AT FINAL GRADE, PERMANENT EROSION CONTROLS SHALL BE APPLIED WITHIN 2 DAYS OF REACHING FINAL GRADE.
9. FOR ANY OTHER AREAS THAT ARE AT FINAL GRADE, PERMANENT EROSION CONTROLS SHALL BE APPLIED WITHIN 7 DAYS OF REACHING FINAL GRADE WITHIN THAT AREA.
10. DISTURBED AREAS THAT HAVE NOT YET BEEN FINALLY STABILIZED SHALL BE INSPECTED AT LEAST ONCE EVERY 7 CALENDAR DAYS AND WITHIN 24 HOURS FOLLOWING THE END OF A STORM EVENT THAT IS 0.5 INCHES OR GREATER.
11. THE CONTRACTOR SHALL PROVIDE ADEQUATE DRAINAGE (CONSISTENT WITH SEDIMENT/EROSION PRACTICES) OF THE WORK AREA AT ALL TIMES.
12. NECESSARY REPAIRS TO DAMAGED BARRIERS AND/OR REPLACEMENT OF SAME SHALL BE ACCOMPLISHED IMMEDIATELY.
13. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH RAINFALL OR WHEN LEVEL OF DEPOSIT REACHES APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
14. ANY SEDIMENT DEPOSITS REMAINING IN PLACE AFTER THE BARRIERS ARE NO LONGER REQUIRED SHALL BE REGRADED AS NECESSARY AND SEEDED.
15. EROSION CONTROL SILT FENCE SHALL BE INSTALLED DURING CONSTRUCTION ACTIVITIES AT A MINIMUM DISTANCE OF 5 FEET FROM THE TOE OF EACH EARTH MOUND OR ALONG THE PROPERTY LINE IF A MOUND IS NOT PRESENT.



SLOPE CHECK



DITCH CHECK



ATTACHING TWO SILT FENCES

NOTE: SILT FENCE TO BE INSTALLED PARALLEL TO SLOPE.

5 SILT FENCE DETAILS
SCALE: N.T.S.

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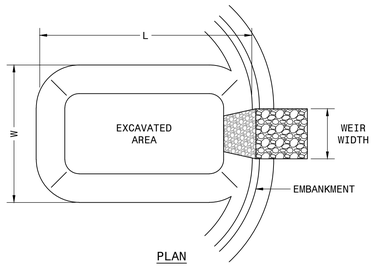
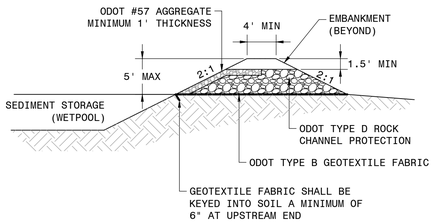
CAD DWG File:	RCK001.100.0007
Plot Date:	7/22/16
Layout By:	JAH
Drawn By:	SAH
Check By:	JAH/SDM
Scale:	AS NOTED
Issue Date:	JULY 2016

Sheet Title:
TYPICAL DETAILS
(1 OF 2)

Sheet Number: 10 OF 11
C7.0



PLAN



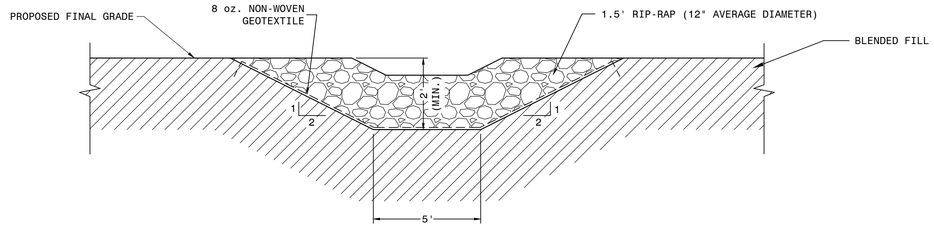
OUTLET SECTION

1 SEDIMENT TRAP DETAIL

SCALE: N.T.S.

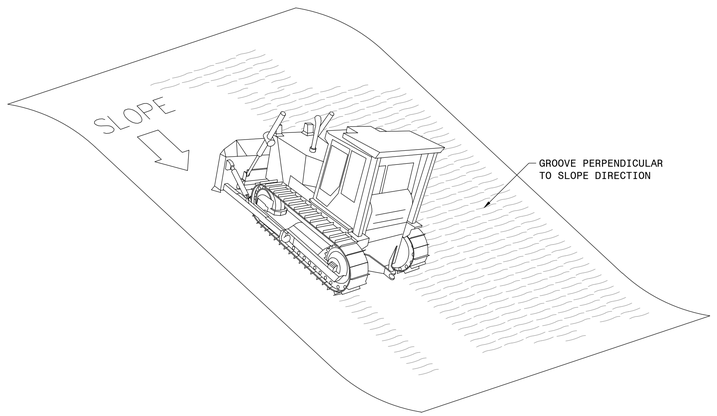
NOTES:

1. SEDIMENT TRAPS SHALL BE CONSTRUCTED PRIOR TO COMMENCEMENT OF ANY GRADING ACTIVITY.
2. SEDIMENT TRAPS SHALL BE CONSTRUCTED PER THESE PLANS AND DETAILS AND IN ACCORDANCE WITH THE SPECIFICATIONS FOR SEDIMENT TRAPS IN THE ODNR RAINWATER AND LAND DEVELOPMENT MANUAL.
3. ALL SLOPES OF EMBANKMENT ALONG THE AGGREGATE FILTER SHALL BE NO STEEPER THAN 2:1, UNLESS OTHERWISE INDICATED.
4. SEDIMENTATION ACCUMULATED IN THE SEDIMENT STORAGE ZONE SHALL BE REMOVED WHEN SEDIMENT REACHES THE TOP OF SEDIMENT STORAGE ZONE ELEVATION. THIS ELEVATION SHALL BE INDICATED BY THE TOP OF A WOODEN STAKE SET IN THE CENTER OF THE SEDIMENT TRAP. REMOVED SEDIMENTATION SHALL BE DISPOSED OF BY PLACING IT IN THE ON-SITE SOIL STOCKPILE AND STABILIZING WITH VEGETATION.
5. CONSTRUCTION FENCING SHALL BE PLACED AROUND THE PERIMETER OF SEDIMENT TRAPS UNTIL THE SITE IS STABILIZED AND SEDIMENT STORAGE ZONE IS TO BE BACKFILLED.
6. AFTER GRADING AND CONSTRUCTION ACTIVITIES ARE COMPLETED AND THE SITE IS STABILIZED, THE SEDIMENT TRAP SHALL BE PREPARED FOR BACKFILL AND COMPACTED WITH STRUCTURAL FILL AND TOPPED WITH 4" OF TOPSOIL ACROSS THE ENTIRE FILLED SURFACE. ALL ACCUMULATED SEDIMENTS SHALL BE REMOVED PRIOR TO PREPARATION FOR BACKFILL. THE FINAL GRADE OF THE BACKFILLED MATERIAL SHALL PROVIDE A MINIMUM 1% SLOPE TO ENSURE POSITIVE DRAINAGE (SEE GRADING PLAN). SEED AND MULCH THE FILLED AREA PER THE SEEDING SECTIONS IN THESE PLANS.



2 TYPICAL ROCK LETDOWN DETAIL

SCALE: N.T.S.



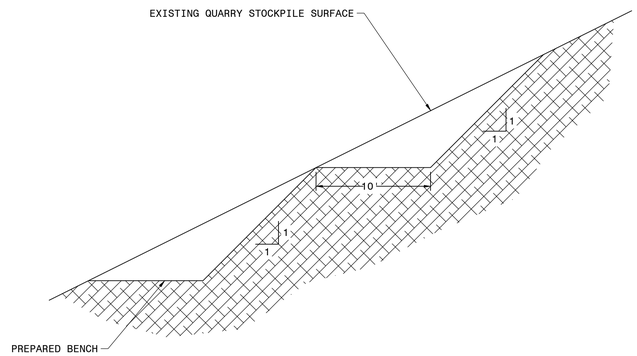
3 SLOPE TRACKING DETAIL

SCALE: N.T.S.

NOTES:

1. DRIVE TRACKED EQUIPMENT IN THE PROPER DIRECTION TO CREATE GROOVES PERPENDICULAR TO THE SLOPE. GROOVES WILL ACT AS PONDING AREAS OR TRAPS ON EXPOSED SLOPES.
2. TRACK SLOPES PRIOR TO SEEDING AND MULCHING.
3. TRACK SLOPES PRIOR TO RAIN EVENTS TO REDUCE EROSION.

CAUTION: TRACKING SLOPES PARALLEL WITH THE DIRECTION OF FLOW WILL PROMOTE EROSION RATHER THAN HELP TO CONTROL EROSION.



4 EXISTING QUARRY STOCKPILE SLOPE FILL BENCHING DETAIL

SCALE: N.T.S.

NOTES:

1. 10' PREPARED BENCH SHALL BE PROOF ROLLED WITH A FULLY LOADED TANDEM-AXLE DUMPTRUCK (OR EQUIVALENT) PRIOR TO PLACEMENT OF BLENDED FILL. UNSTABLE OR SOFT AREAS IDENTIFIED DURING PROOF ROLL SHALL BE UNDERCUT AND REPLACED WITH SUITABLE MATERIAL TO CREATE A STABLE SUBGRADE.
2. IF EXISTING STOCKPILE PROVES TO BE UNSTABLE, THE ENTIRE STOCKPILE MAY NEED TO BE REMOVED DOWN TO COMPETENT SUBGRADE/ROCK.

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Sheet Title:
TYPICAL DETAILS
(2 OF 2)

Sheet Number: 11 OF 11
C8.0

APPENDIX ~~F~~E

Global Slope Stability Analysis

APPENDIX ~~F~~E

GLOBAL SLOPE STABILITY ANALYSIS
ROCKY RIDGE QUARRY

OBJECTIVE

A slope stability analysis was completed to evaluate the stability of the proposed final slopes at the Rocky Ridge Quarry. This analysis evaluates the stability of the Site at completion of the first phase of work for the fill considered most susceptible to failure (i.e., the outward facing perimeter slopes).

APPROACH AND ASSUMPTIONS

The determination of the critical slopes for analysis was based on the fill height, slopes, and location of the fill material. The cross-sections were developed with the understanding that interim fill areas will be placed at a 2:1 slope while final fill areas will be completed with a 3:1 slope. The slopes were evaluated using effective (long-term) and total (short-term) stress conditions based on our assumptions regarding the shear strength parameters governing soil slope stability, and laboratory testing results completed by TTL in 2014 (see Appendix H-2 of the IAWMP).

Circular (global) slope stability analyses were performed on the cross-sections using the Simplified Bishop Method using Slide, version 7.017, developed by Rocscience. This program evaluates the stability of the cross-section with a two-dimensional, limiting equilibrium method by analyzing numerous trial slip surfaces to find the critical failure surface that results in the lowest factor of safety (FOS) for the slope. Each slip surface is composed of a series of straight-line segments of equal length. Slide generates the potential failure surfaces within a user-defined grid area and calculates the FOS from the most critical surface within the grid area.

INPUT PARAMETERS

The input parameters for the fill material, and *in situ* limestone bedrock used in the slope stability analyses are provided below. The shear strength values selected for the fill material are conservative assumed values based on our experience with local soils. Tables H-1and H-2 summarize the soil parameters used in the analyses.

Table H-1
Material Properties Used for the Drained Scenarios in the Slope Stability Analysis

Material Type	Material Properties			
	Unit Weight (pcf)	Saturated Unit Weight (pcf)	Cohesion (psf)	Internal Friction Angle (degrees)
Fill Material	125	130	250	23
Limestone	145	150	3000	28

Table H-2
Material Properties Used for the Undrained Scenarios in the Slope Stability Analysis

Material Type	Material Properties			
	Unit Weight (pcf)	Saturated Unit Weight (pcf)	Cohesion (psf)	Internal Friction Angle (degrees)
Fill Material	125	130	1600	0
Limestone	145	150	3000	28

A horizontal acceleration factor of 0.10g was implemented into the analysis. This horizontal factor is the peak acceleration with 2% probability of exceedance in 50 years. This factor, accounting for seismic conditions, was provided by the United States Geological Survey's (USGS) National Seismic Hazard Mapping Project for the approximate Site location.

SUMMARY

The slope stability analyses performed indicate that the proposed grades for the fill material produce factors of safety (FOS) above industry standard minimum acceptable values of 1.3 for static conditions and 1.0 for seismic conditions. The results from the analyses are provided below in Tables H-3 and H-4. The computer output sheets from the Slide software are attached.

Table H-3
North-South Section FOS Summary Table

Analyzed Scenario	Drained Conditions	Undrained Conditions	Minimum Acceptable FOS
Rotational – Static	2.3	4.6	1.3
Rotational – Seismic	1.7	N/A	1.0

Table H-4
East-West Slope FOS Summary Table

Analyzed Scenario	Drained Conditions	Undrained Conditions	Minimum Acceptable FOS
Rotational – Static	1.6	2.7	1.3
Rotational – Seismic	1.3	N/A	1.0

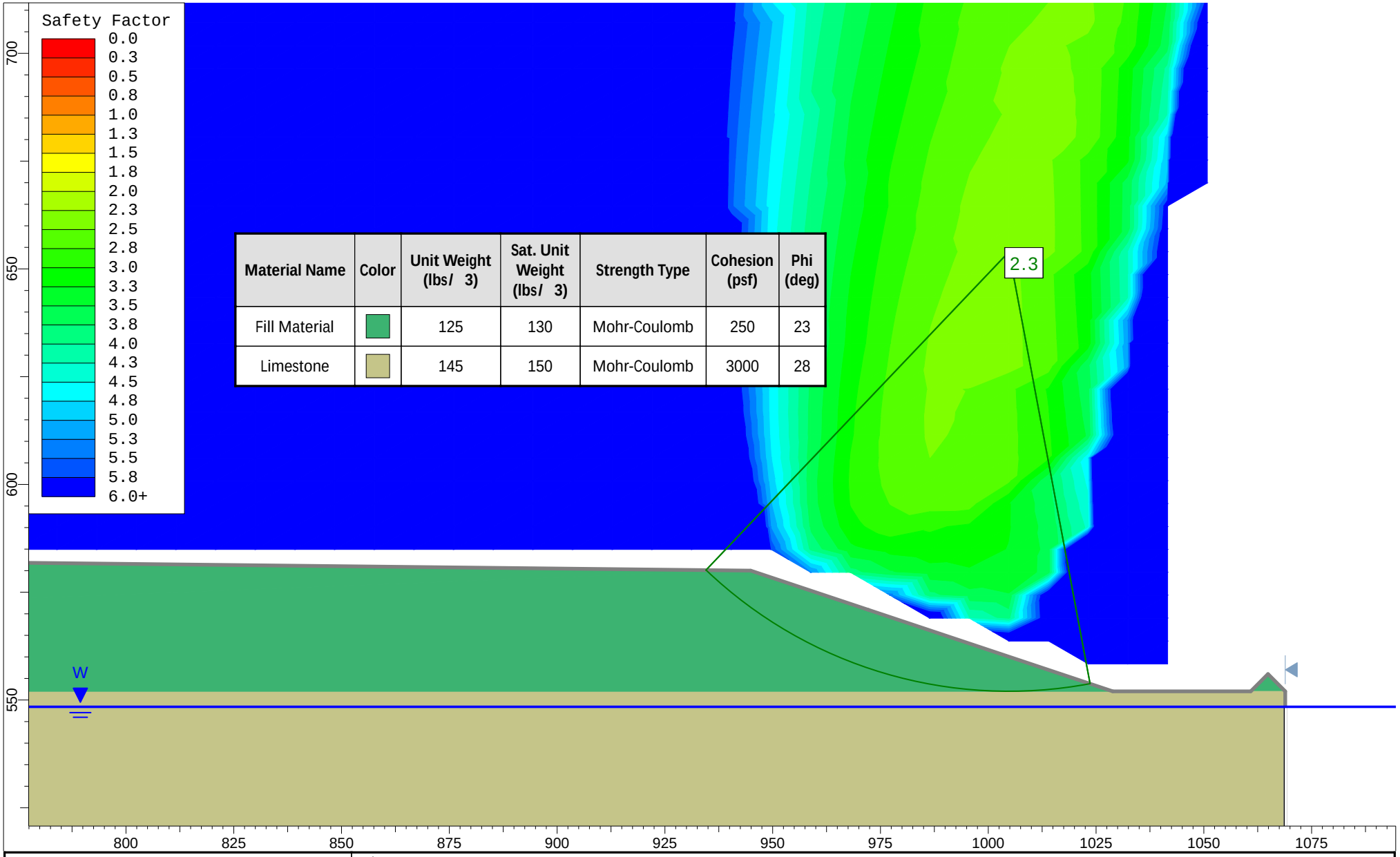
REFERENCES

Abramson, Lee W., Lee, Thomas S., Sharma, Sunil, Boyce, Glenn M. 1996. *Slope Stability and Stabilization Methods*. Wiley-Interscience Publication: New York. pp. 368 and 392.

Holtz, Robert D., Kovacs, William D. 1981. *An Introduction to Geotechnical Engineering*. Prentice-Hall, Inc.: Englewood Cliffs, New Jersey. pg. 556.

ODOT Geotechnical Bulletin GB6: Shear Strength of Proposed Embankments (dated January 15, 2016).

NORTH-SOUTH SECTION FOS OUTPUT PAGES

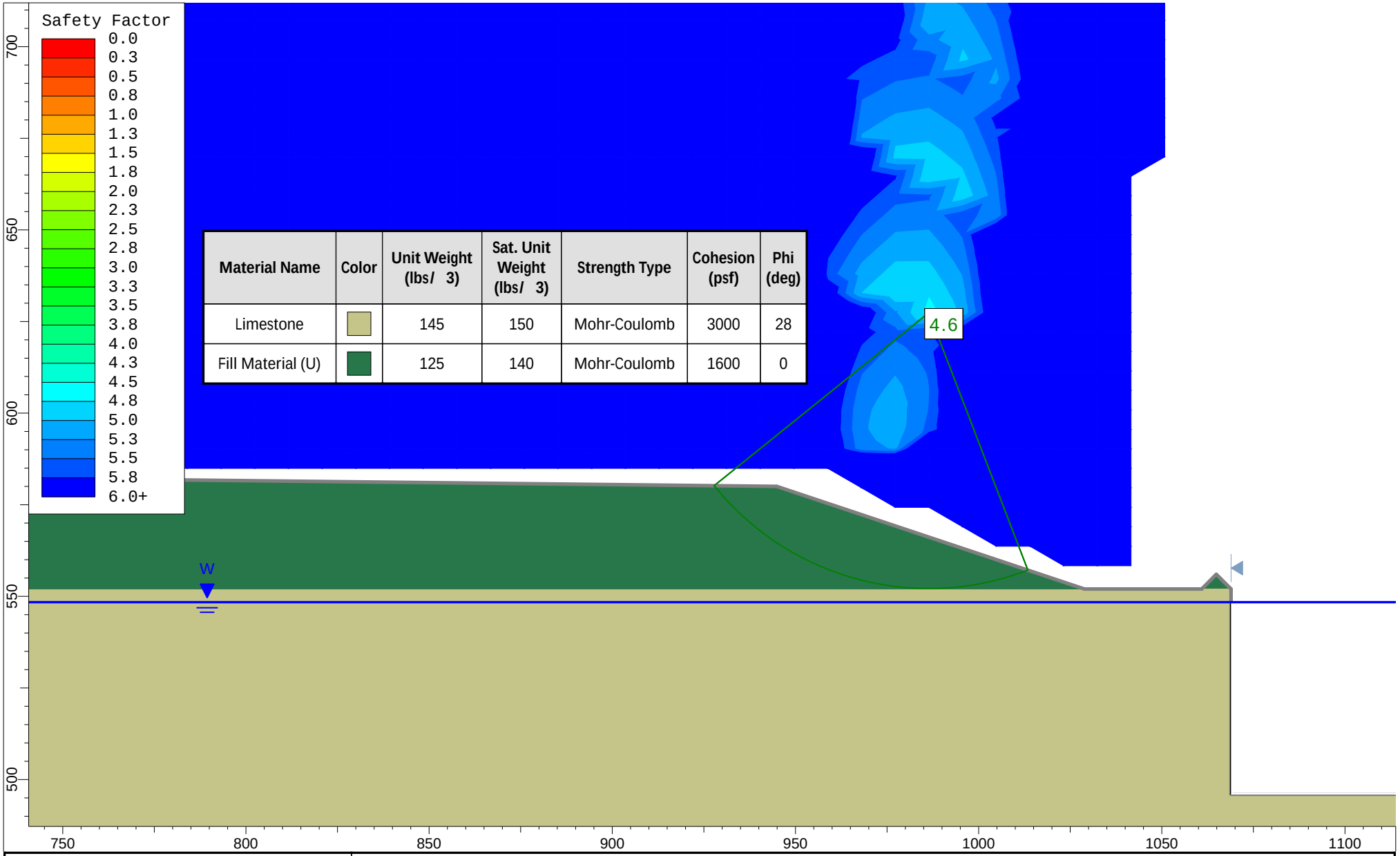


Material Name	Color	Unit Weight (lbs/ 3)	Sat. Unit Weight (lbs/ 3)	Strength Type	Cohesion (psf)	Phi (deg)
Fill Material		125	130	Mohr-Coulomb	250	23
Limestone		145	150	Mohr-Coulomb	3000	28

HULL

Project	RCK001 Lime IAWMP Slope Stability North-South		
Analysis Description	Bishop Simplified		
Drawn By	Dan Pratt	Scale 1:369	Company Hull & Associates, Inc.
Date	7/18/2016		File Name RKC001 Slope Stability N-S.slmd

SLIDEINTERPRET 7.017



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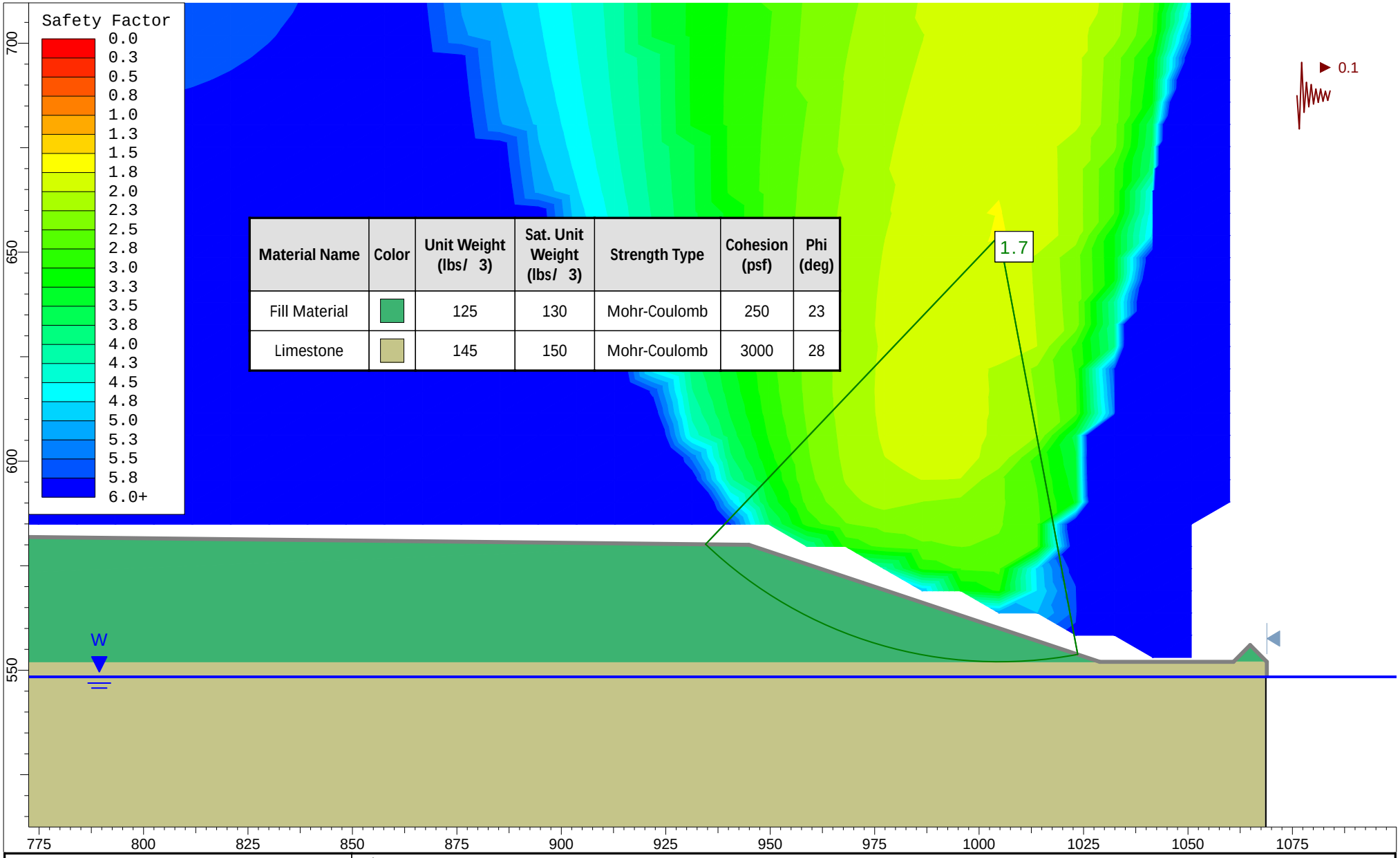

Material Name	Color	Unit Weight (lbs/ 3)	Sat. Unit Weight (lbs/ 3)	Strength Type	Cohesion (psf)	Phi (deg)
Fill Material		125	130	Mohr-Coulomb	250	23
Limestone		145	150	Mohr-Coulomb	3000	28

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SLIDEINTERPRET 7.017

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Analysis Description	Bishop Simplified		
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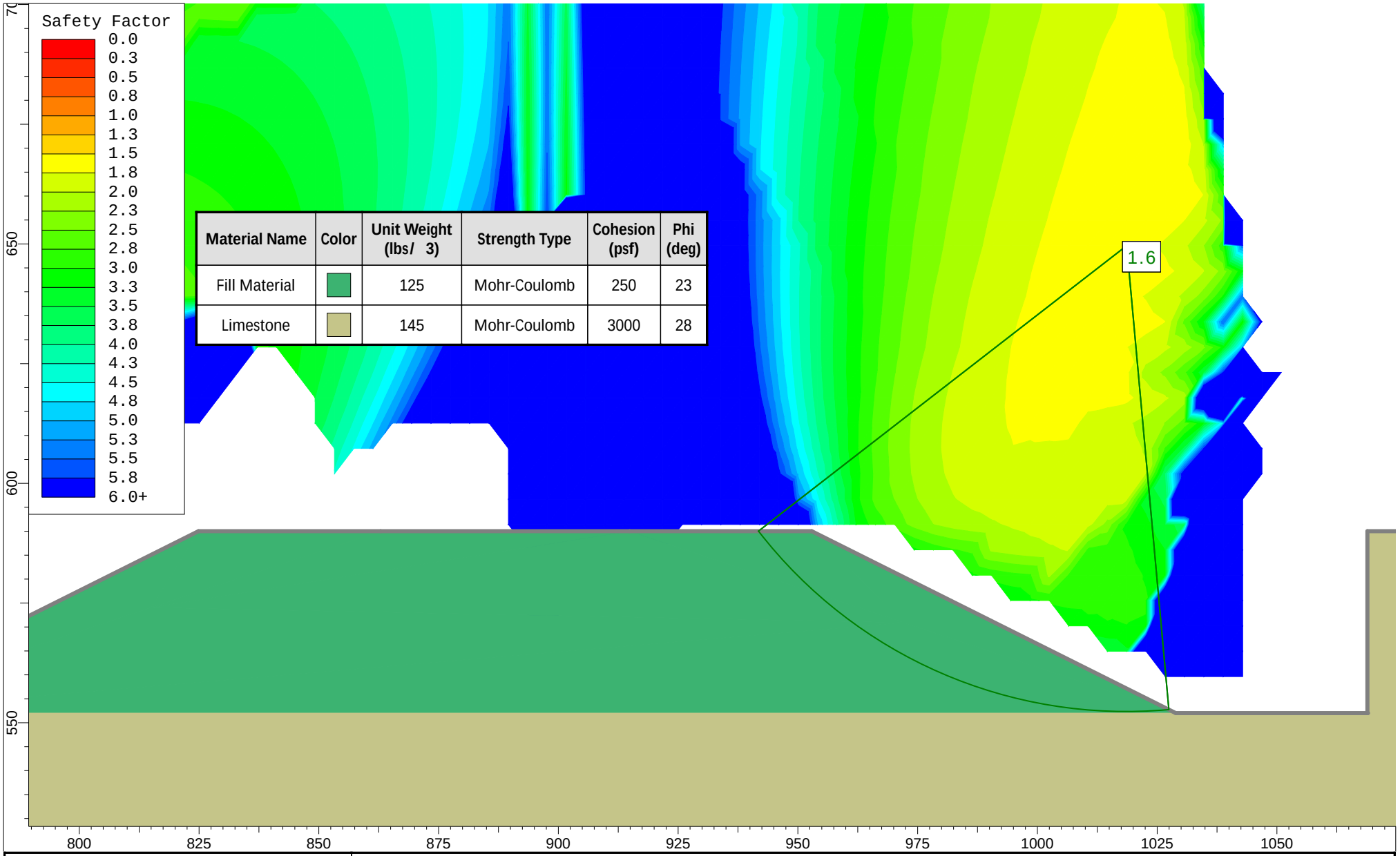
EAST-WEST SLOPE SECTION FOS OUTPUT PAGES



Material Name	Color	Unit Weight (lbs/ 3)	Strength Type	Cohesion (psf)	Phi (deg)
Fill Material		125	Mohr-Coulomb	250	23
Limestone		145	Mohr-Coulomb	3000	28

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SLIDEINTERPRET 7.017

Project	RCK001 Lime IAWMP Slope Stability East-West		
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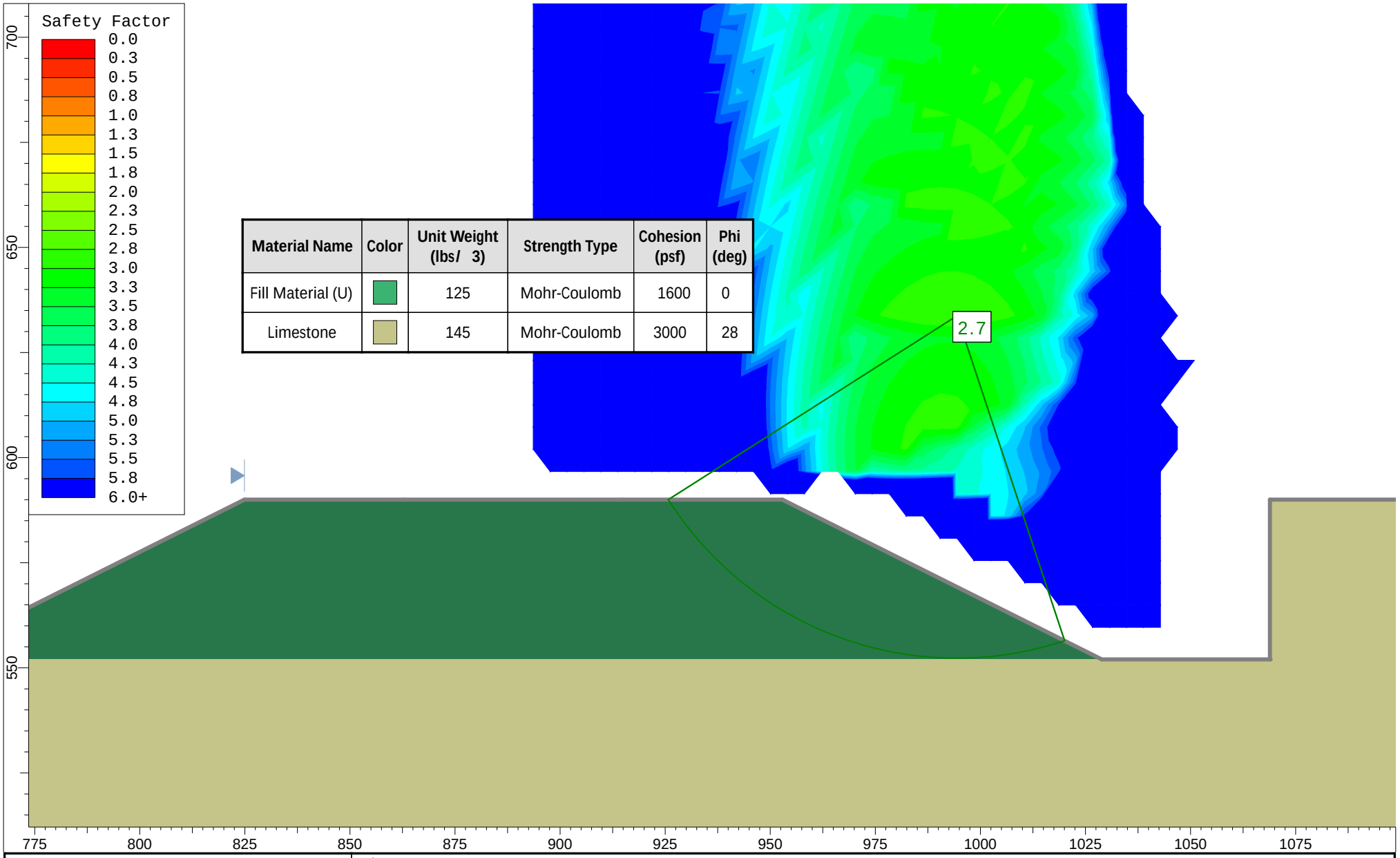
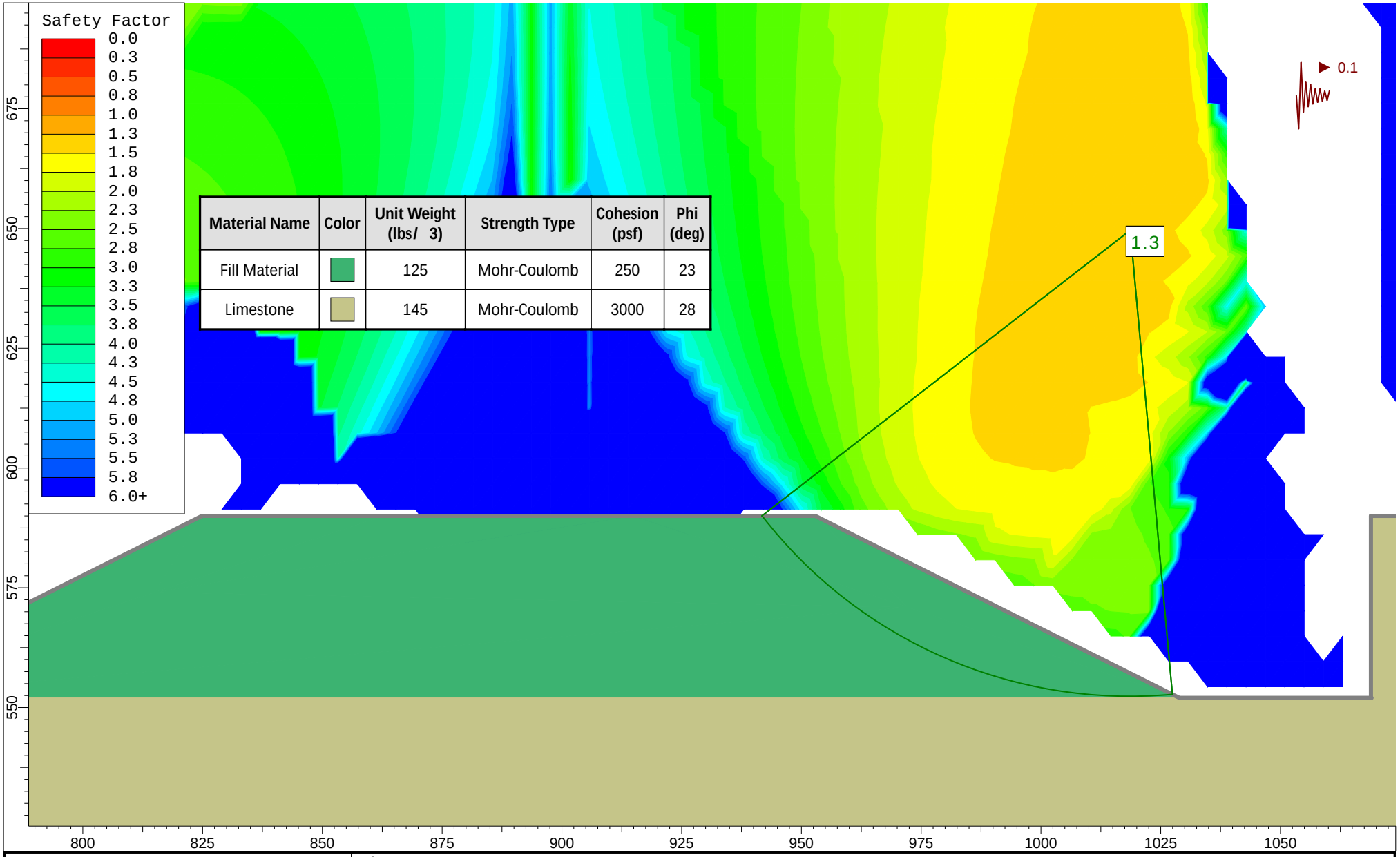


Material Name	Color	Unit Weight (lbs/ 3)	Strength Type	Cohesion (psf)	Phi (deg)
Fill Material (U)		125	Mohr-Coulomb	1600	0
Limestone		145	Mohr-Coulomb	3000	28

HULL

SLIDEINTERPRET 7.017

Project	RCK001 Lime IAWMP Slope Stability East-West		
Analysis Description	Bishop Simplified		
Drawn By	Dan Pratt	Scale 1:379	Company Hull & Associates, Inc.
Date	7/18/2016		File Name RKC001 Slope Stability N-S.slmd



Material Name	Color	Unit Weight (lbs/ 3)	Strength Type	Cohesion (psf)	Phi (deg)
Fill Material		125	Mohr-Coulomb	250	23
Limestone		145	Mohr-Coulomb	3000	28

HULL

SLIDEINTERPRET 7.017

Project	RCK001 Lime IAWMP Slope Stability East-West		
Analysis Description	Bishop Simplified		
Drawn By	Dan Pratt	Scale 1:332	Company Hull & Associates, Inc.
Date	7/18/2016		File Name RKC001 Slope Stability N-S.slmd

APPENDIX ~~G~~F

Geotechnical Information on Soil-~~Lime~~~~DWTM~~DWTM Blend

APPENDIX ~~G~~F-1

Summary of Geotechnical Laboratory Testing Results for the Rocky Ridge Quarry
(prepared by Hull; dated June 7, 2016)

Memorandum

TO: Scott Stansley (Rocky Ridge Development, LLC)

FROM: Shawn McGee, P.E. and Jeff Henfling, P.E.

DATE: June 7, 2016

RE: Summary of Geotechnical Laboratory Testing Results for the Rocky Ridge Quarry in Graytown, Ottawa County, Ohio; RCK001.100.0015.

Hull & Associates, Inc. (Hull) is pleased to provide Rocky Ridge Development, LLC (Rocky Ridge) the results of the geotechnical laboratory testing of proposed materials to be used during the spent lime beneficial use project at the Rocky Ridge Quarry located at 14591 W. Toussaint North in Graytown, Ottawa County, Ohio (Site). The purpose of the geotechnical laboratory testing was to obtain a better understanding of the relevant engineering properties of the proposed embankment fill materials and provide geotechnical information to support construction (earthwork) planning and design considerations. A geotechnical engineer has planned and supervised the performance of the geotechnical engineering services, considered the findings, and prepared this summary report in accordance with industry accepted geotechnical engineering practices.

BACKGROUND

The Rocky Ridge Quarry (Site) has current plans to receive, mix, and embank a soil-lime blended material at the Site. Lime will be transported from the Toledo Wastewater Treatment Plant to the Site, where it is planned to be mixed by volume with conventional construction equipment, and placed on-Site in accordance with Phasing Plans prepared by Hull in 2015 and applicable Ohio EPA approvals. On-Site (native) soils will be utilized with the imported lime to create the blended embankment material. In order to ensure proper placement of embankment, samples of the native soils and samples of lime were collected by Rocky Ridge and provided to Hull for geotechnical laboratory testing. Additionally, environmental testing of these materials was performed and are being presented under a separate cover. The results of the laboratory-based analysis were used to establish proposed construction methods (e.g., optimal blends for the lime and soil blend, lift thicknesses, material preparation for placement and compactability, etc.) to be followed during placement of the material at the Site.

GEOTECHNICAL LABORATORY TESTING APPROACH

Hull received samples collected by Rocky Ridge, which included buckets of native soils from four (4) locations (i.e., Sample Locations 1, 2, 3A, and 4), as well as buckets of lime. Moisture content as-received by the laboratory (ASTM D2216), liquid and plastic limits (Atterbergs, ASTM D4318), and grain-size analysis (ASTM D422, AASHTO T88) was performed on each native soil sample to classify them according to the United Soils Classification System (USCS). Select native soils and lime was mixed/blended in the laboratory based on a volumetric method to simulate construction methods, and tested for the Standard Proctor Method (ASTM D698), Specific Gravity (ASTM D854), and Flexible Wall Permeability (ASTM D5084).

Index Testing (Grain Size Distribution and Atterberg Limits) Results

The four native on-Site soil samples tested can be described as a lean clay with sand or a lean clay and classified with the USCS group symbol of "CL". Table 1 provides a summary of the grain-size distribution results.

Table 1 – USCS Classification Test Results

Sample Location	Hull Lab #	USCS Classification (USCS Group Symbol)	Moisture Content (%)	Percent Gravel (%)	Percent Sand (%)	Percent Silt (%)	Percent Clay (5mm) (%)
1	B16-1040	Lean CLAY with Sand (CL)	16.6	1.3	16.8	29.2	52.7
2	B16-1041	Lean CLAY with Sand (CL)	18.3	2.0	21.0	29.7	47.3
3A	B16-1043	Lean CLAY (CL)	24.1	0.7	7.3	31.7	60.2
4	B16-1042	Lean CLAY with sand (CL)	14.1	2.8	19.5	31.0	46.7

The liquid limits ranged from 30 to 48 with the plasticity indices ranging from 14 to 26. Table 2 provides the results of the Atterberg limits.

Table 2 – Atterberg Limits Test Results

Sample Location	Lab ID	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)
1	B16-1040	37	19	18
2	B16-1041	33	17	16
3A	B16-1043	48	22	26
4	B16-1042	30	16	14

Grain Size Distribution Reports and Atterberg results are provide in Attachment A.

Standard Proctor Testing Results

Based on the similarity of the grain size distribution and plasticity characteristics, one native sample location was used in the blending phase of the laboratory testing. As a conservative approach, sample location 2 was selected due to the material having the least amount of percentage of clay and lowest range of moisture content in which the material exhibits plasticity characteristics (i.e., lowest plasticity index value), suggesting the material will have the highest hydraulic conductivity/permeability. Based on the chemical results of the lime material, lime from Sample E-2 was utilized in the blends. It was important to use material from a single source for all sample blends so the test results would have a single independent variable (i.e., blend ratio) and test results would not be skewed.

The following three soil/lime blends were selected for the testing program:

- 50% Native Soil and 50% Lime
- 67% Native Soil and 33% Lime
- 33% Native Soil and 67% Lime

In order to best replicate the mixing technique in the field, the native soils and lime were blended by bulk volume (not drying the material out). The samples were prepared and dry prepped for subsequent Proctor testing following blending of the soil and lime to ensure the proper blending ratios were achieved. The results of the Standard Proctor Testing of the three blends is shown in Table 3.

Table 3 – Standard Proctor Test Results

Blend*	Lab ID	Maximum Dry Density (pcf)	Optimum Moisture Content (%)	Specific Gravity
50% On-Site Soil and 50% Lime	B16-1160	105.7	18.8	2.70
67% On-Site Soil and 33% Lime	B16-1161	108.5	17.2	2.75
33% On-Site Soil and 67% Lime	B16-1162	103.7	19.8	2.70

* Native Soil was taken from Sample Location 1 and Lime was from Sample E-2.

As expected, the maximum dry density decreased, with an increasing percentage of lime. The optimum moisture content of the blended material was also relatively consistent – the higher the maximum dry density, the lower the optimum moisture content. Also, there was a slight increase in the specific gravity with a higher percentage of soil (i.e., 67% soil as compared to the 33% and 50% soil blends). As previously mentioned, the blends were mixed by volume, not by weight, and thus should be comparable to how the material will be handled and blended by construction equipment on-Site (i.e., with an excavator bucket).

Copies of the laboratory test results for the Standard Proctor testing are provided in Attachment B.

The grain-size analysis and Standard Proctor testing was completed at Hull's AASHTO-accredited geotechnical/materials testing laboratory. The permeability testing was completed by Geotechnical Testing Services, Inc. of Coraopolis, Pennsylvania - a third party, commercial testing laboratory also accredited by AASHTO. Soil samples will be stored at our geotechnical/materials testing laboratory for 90 days from the date of this report unless otherwise directed by you.

Flexible Wall Permeability Testing

Hydraulic conductivity measurements using a flexible wall permeameter (ASTM D5084) was completed to evaluate the permeability of the various blends of native soil and lime as discussed above. The blended samples were remolded at 95% of the maximum dry density and 2% above optimum moisture content as determined by the moisture-density relationships per the Standard Proctor testing results as previously discussed. The permeability results were relatively similar between the three blends and ranged between 6.4×10^{-6} and 1.1×10^{-5} cm/sec. Based on the testing results, there does not appear to be a correlation between the permeability and the amount of soil/lime in the blend.

Table 4 – Permeability Test Results

Blend*	Lab ID	Hydraulic Conductivity (cm/sec)
50% On-Site Soil and 50% Lime	B16-1160	1.1×10^{-5}
67% On-Site Soil and 33% Lime	B16-1161	6.4×10^{-6}
33% On-Site Soil and 67% Lime	B16-1162	7.2×10^{-6}

* Native Soil was taken from Sample Location 1 and Lime was from Sample E-2.

The permeability test reports are provided in Attachment C.

All phases of the geotechnical laboratory-testing program was conducted in general accordance with applicable *American Society for Testing and Materials* (ASTM) and *American Association of State Highway and Transportation Officials (*AASHTO) specifications and Hull's Standard Operating Procedures.

SUMMARY

Based on the results of the laboratory testing, it appears the blended materials are suitable for its intended use as embankment material as a screening berm and to fill the quarry at the Site. The native soil is a lean clay and a lean clay with sand (CL) of moderate plasticity. Once mixed with the lime, the blended material at all three blends appear to be a compactable material with relatively low permeability. Therefore, the blended material at all three blends can be considered suitable for use in the beneficial use application at the Site.

CLOSING REMARKS

The evaluations, conclusions, and recommendations presented in this memorandum are based on information disclosed by the limited number of sampling locations and samples tested, our interpretation of the field and laboratory data obtained during the exploration, and our understanding of the project. The information obtained from the individual sampling locations are representative of the material conditions at the specific sampling locations at the time of sampling, and must be extrapolated to get an understanding of the material conditions between the sampling locations. This extrapolation is based on the limited knowledge of the facility operations and processes and on past experience. Therefore, the recommendations and observations presented in this Report are based in part on the assumption that material conditions encountered will not be altered during construction. Consequently, it is recommended that Hull perform the construction observation and testing to make certain the intent of our recommendations as presented in this Report is being followed and to make real-time changes to our recommendations in the event that site conditions vary from those observed from the laboratory testing. The recommendations in this Report are considered final only if Hull observes the excavation, material blending, and other earthwork activities to determine if actual conditions differ from those encountered during the explorations.

Furthermore, any revision in the plans for the proposed Site from those enumerated in this Report should be brought to the attention of Hull so it may be determined if changes in the earthwork recommendations are required. If additional data are needed for design purposes or if deviations from the noted subsurface conditions are encountered during construction, they should all be brought immediately to the attention of Hull. At that time, it may be necessary for Hull to submit modified or supplementary recommendations, if needed.

STANDARD OF CARE AND LIMITATIONS

The observations presented herein are based on the level of effort and investigative techniques using that degree of care and skill ordinarily exercised under similar conditions by reputable members of the profession practicing in the same or similar locality at the time of service. No other warranties, expressed or implied, are made or intended by this report. An evaluation of past or present compliance with federal, state, or local environmental or land use laws or regulations has not been conducted. Conclusions presented by Hull regarding the Site are consistent with the level of effort specified and investigative techniques employed. Reports, opinions, letters, and other documents do not evaluate the presence or absence of any compound or parameter not specifically analyzed and reported. Hull makes no guarantees regarding the completeness or accuracy of any information obtained from public or private files or information provided by subcontractors. In addition, Hull makes no guarantees on the conditions of the Site or changes in Site records after the date reviewed as indicated in the report.

Furthermore, this letter-report is prepared and made available for the sole use of Rocky Ridge Development, LLC and their assigns for the specific purposes mentioned above. The contents thereof may not be used or relied upon by any other person or entity, without the express written consent and authorization of Rocky Ridge Development, LLC and Hull.

If you have any questions or comments, please feel free to contact Shawn McGee at (440) 232-9945 at your first opportunity.

cc: William G. Petruzzi, P.G., Hull & Associates, Inc. (w/attachments)
Matt Beil, Hull & Associates, Inc. (w/attachments)

ATTACHMENT A

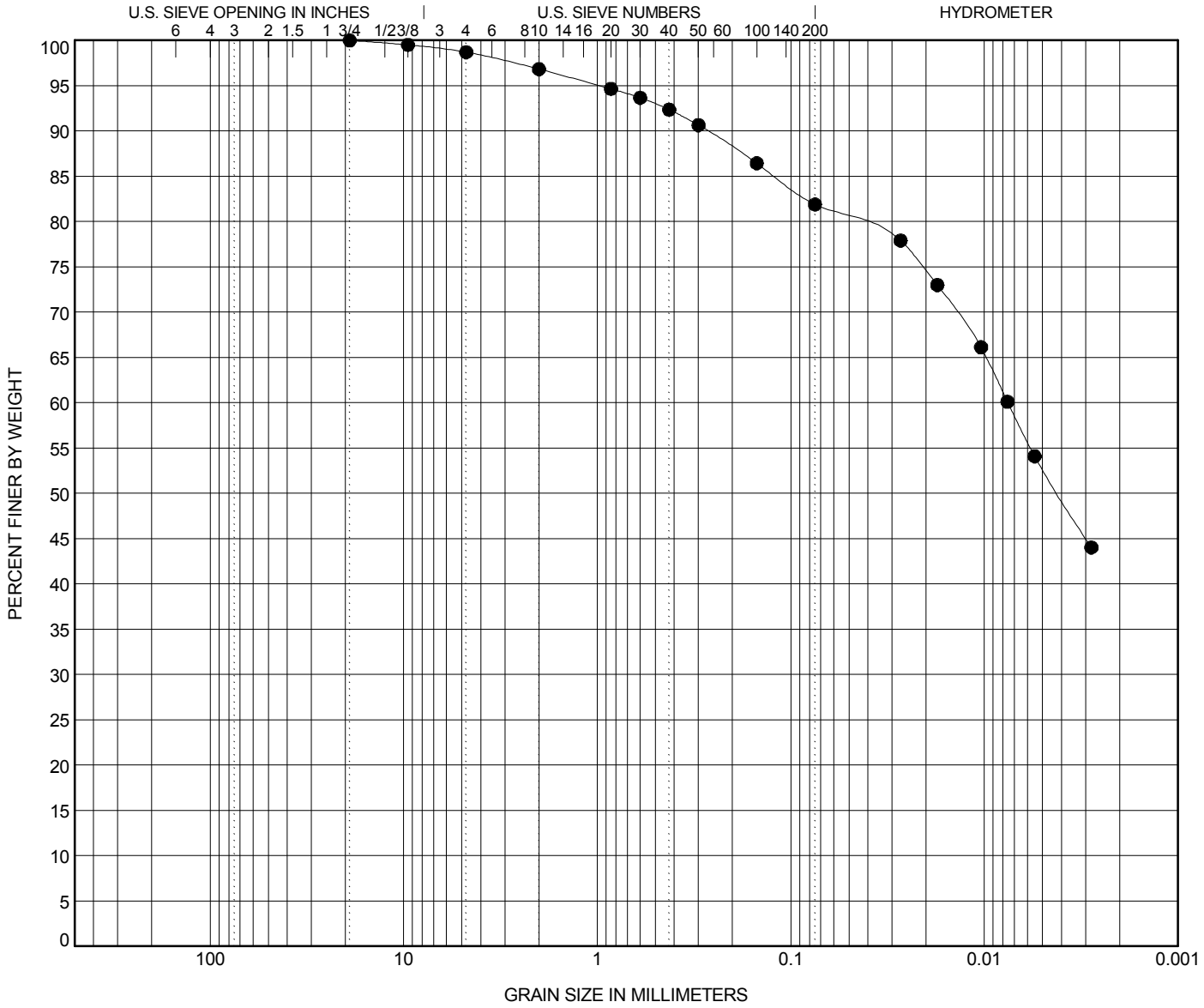
Geotechnical Laboratory Reports
(Grain Size Analysis of Native Soils)

Hull & Associates, Inc.
4 Hemishpere Way
Bedford, Ohio 44146
Telephone (440) 232-9945
Fax (440) 232-9946

GRAIN SIZE DISTRIBUTION

CLIENT Rocky Ridge Development **PROJECT NAME** Rocky Ridge

PROJECT NUMBER RCK001 **PROJECT LOCATION**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	LAB ID	COLOR	USCS Classification	MC	LL	PL	PI	Cc	Cu
● 1	0.0-5.0	B16-1040	Brown	LEAN CLAY with SAND(CL)	16.6%	37	19	18		

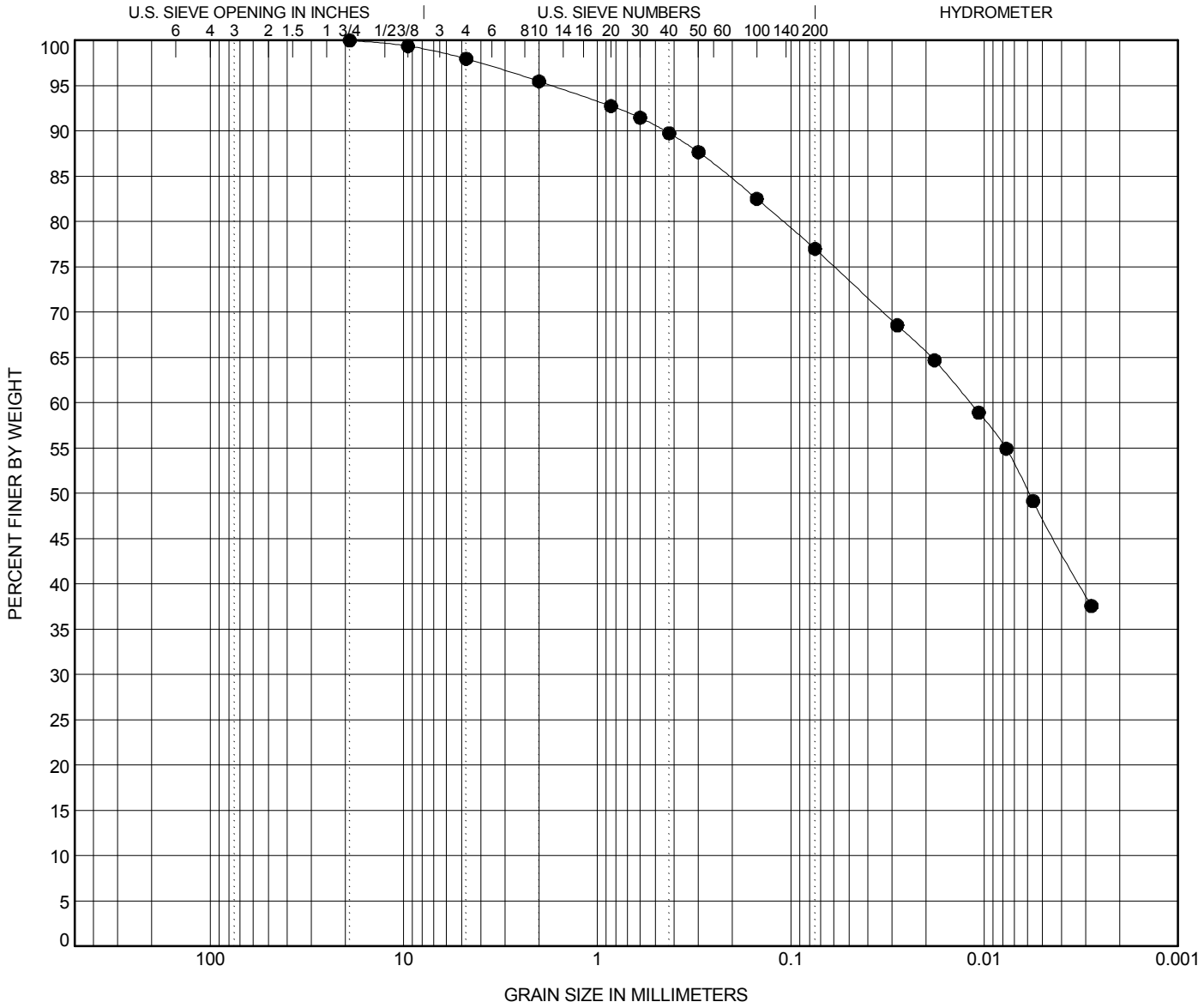
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 1	0.0-5.0	19	0.008			1.3	16.8	29.2	52.7

Hull & Associates, Inc.
4 Hemishpere Way
Bedford, Ohio 44146
Telephone (440) 232-9945
Fax (440) 232-9946

GRAIN SIZE DISTRIBUTION

CLIENT Rocky Ridge Development **PROJECT NAME** Rocky Ridge

PROJECT NUMBER RCK001 **PROJECT LOCATION**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	LAB ID	COLOR	USCS Classification	MC	LL	PL	PI	Cc	Cu
● 2	4.0-18.0	B16-1041	Brown	LEAN CLAY with SAND(CL)	18.3%	33	17	16		

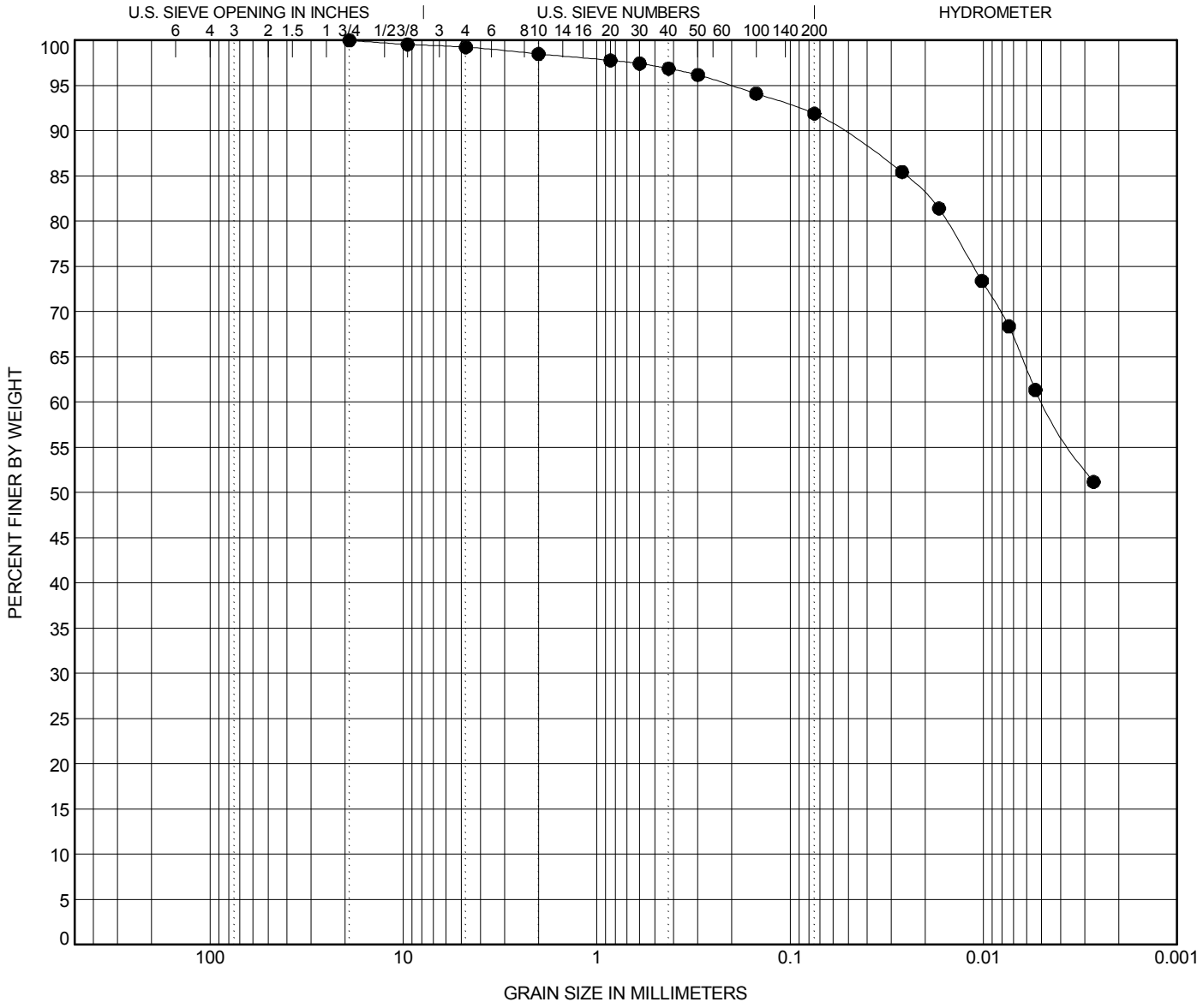
BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 2	4.0-18.0	19	0.012			2.0	21.0	29.7	47.3

Hull & Associates, Inc.
4 Hemishpere Way
Bedford, Ohio 44146
Telephone (440) 232-9945
Fax (440) 232-9946

GRAIN SIZE DISTRIBUTION

CLIENT Rocky Ridge Development **PROJECT NAME** Rocky Ridge

PROJECT NUMBER RCK001 **PROJECT LOCATION**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	LAB ID	COLOR	USCS Classification	MC	LL	PL	PI	Cc	Cu
● 3 - Brown (A)	0.0-12.0	B16-1043	Brown	LEAN CLAY(CL)	24.1%	48	22	26		

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 3 - Brown (A)	0.0-12.0	19	0.005			0.7	7.3	31.7	60.2

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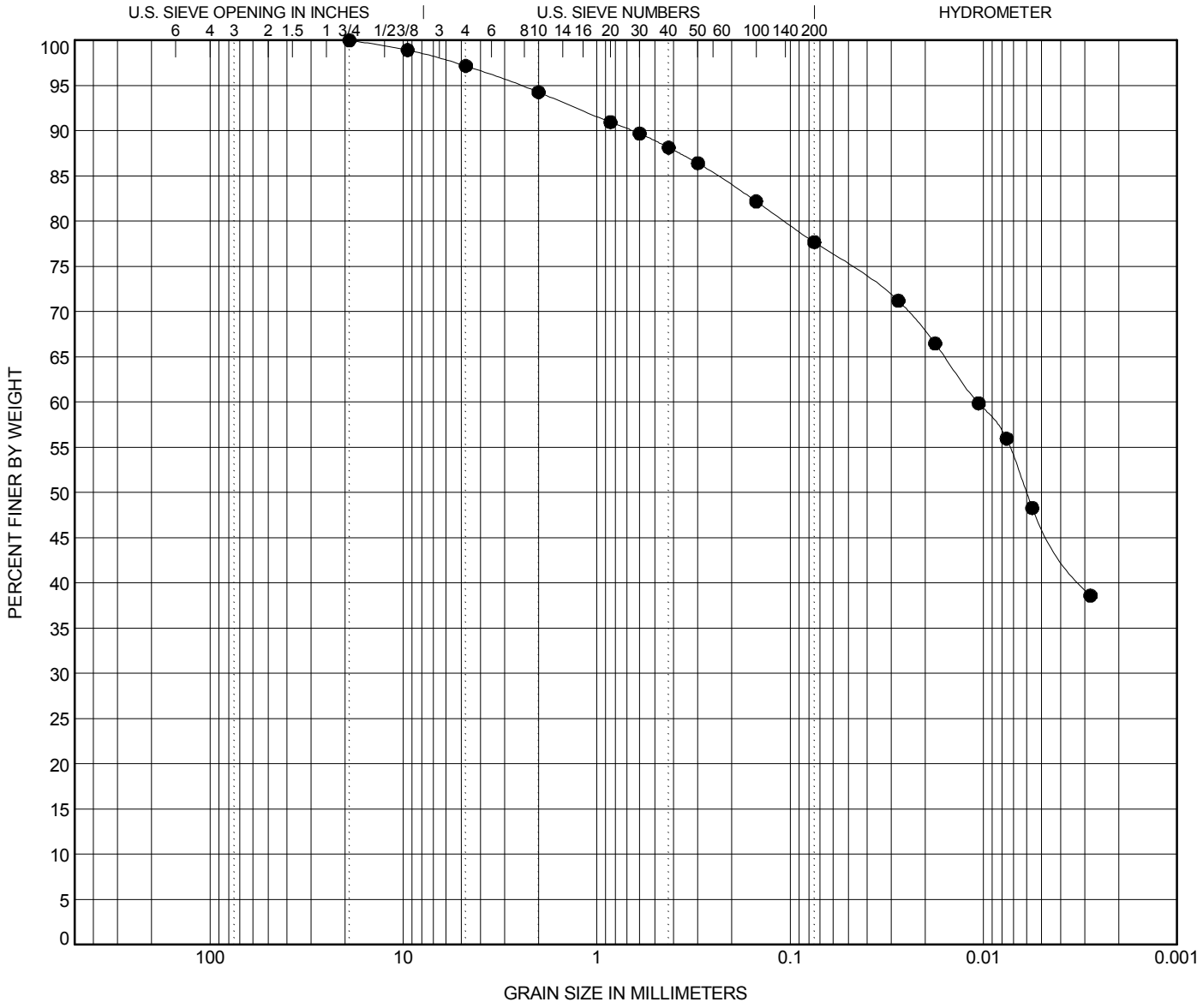
Fax (440) 232-9946

GRAIN SIZE DISTRIBUTION

CLIENT Rocky Ridge Development **PROJECT NAME** Rocky Ridge

PROJECT NUMBER RCK001 **PROJECT LOCATION**



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

BOREHOLE	DEPTH	LAB ID	COLOR	USCS Classification	MC	LL	PL	PI	Cc	Cu
● 4	0.0-8.0	B16-1042	Gray	LEAN CLAY with SAND(CL)	14.1%	30	16	14		

BOREHOLE	DEPTH	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● 4	0.0-8.0	19	0.011			2.8	19.5	31.0	46.7

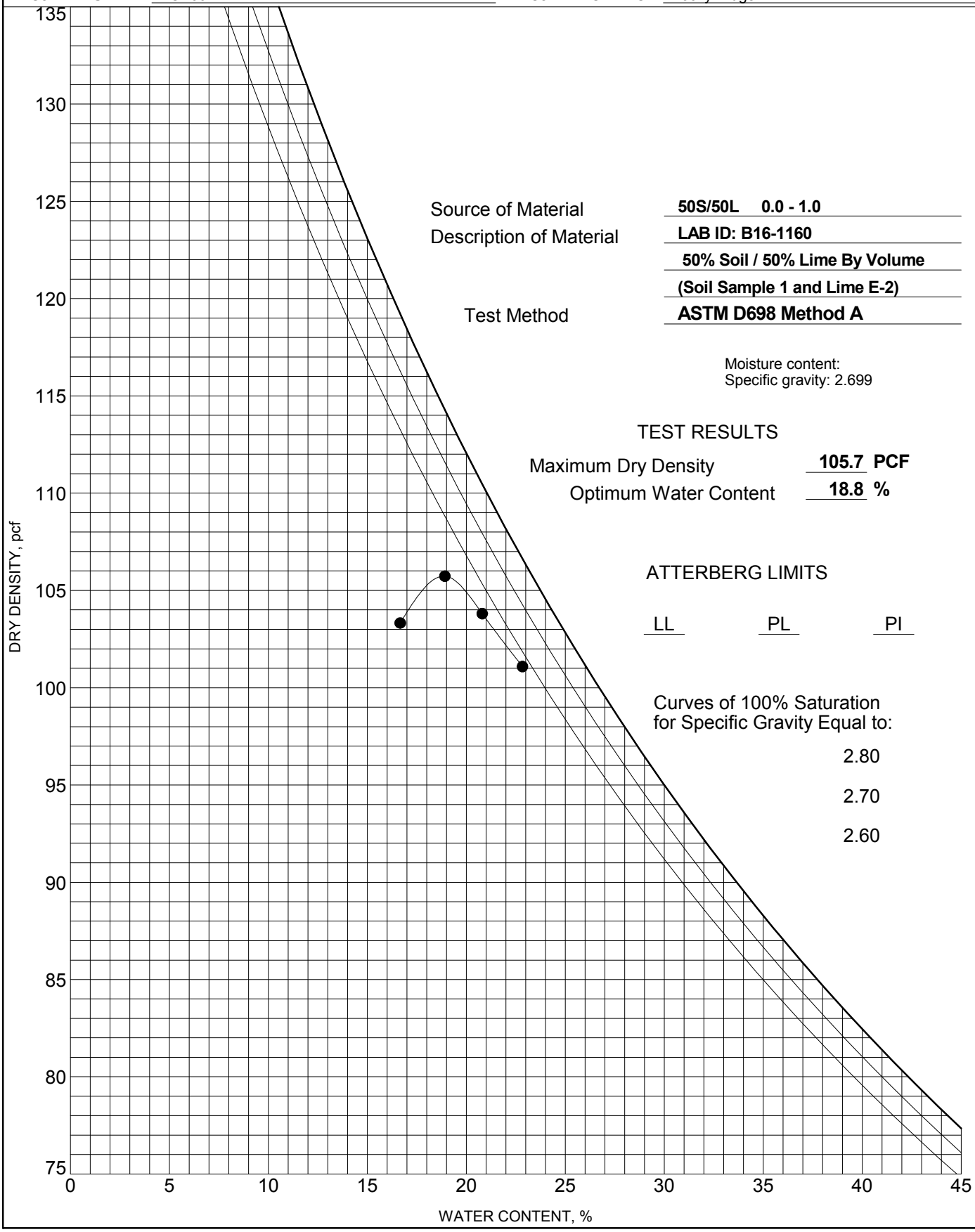
ATTACHMENT B

Geotechnical Laboratory Reports
(Standard Proctor Test Results of Blended Material)

Hull & Associates, Inc.
4 Hemishpere Way
Bedford, Ohio 44146
Telephone (440) 232-9945
Fax (440) 232-9946

MOISTURE-DENSITY RELATIONSHIP

CLIENT Rocky Ridge Development
PROJECT NAME Material Blending
PROJECT NUMBER RCK001
PROJECT LOCATION Rocky Ridge



Source of Material: **50S/50L 0.0 - 1.0**
Description of Material: **LAB ID: B16-1160**
50% Soil / 50% Lime By Volume
(Soil Sample 1 and Lime E-2)
Test Method: **ASTM D698 Method A**

Moisture content:
Specific gravity: 2.699

TEST RESULTS

Maximum Dry Density **105.7** **PCF**
Optimum Water Content **18.8** **%**

ATTERBERG LIMITS

LL PL PI

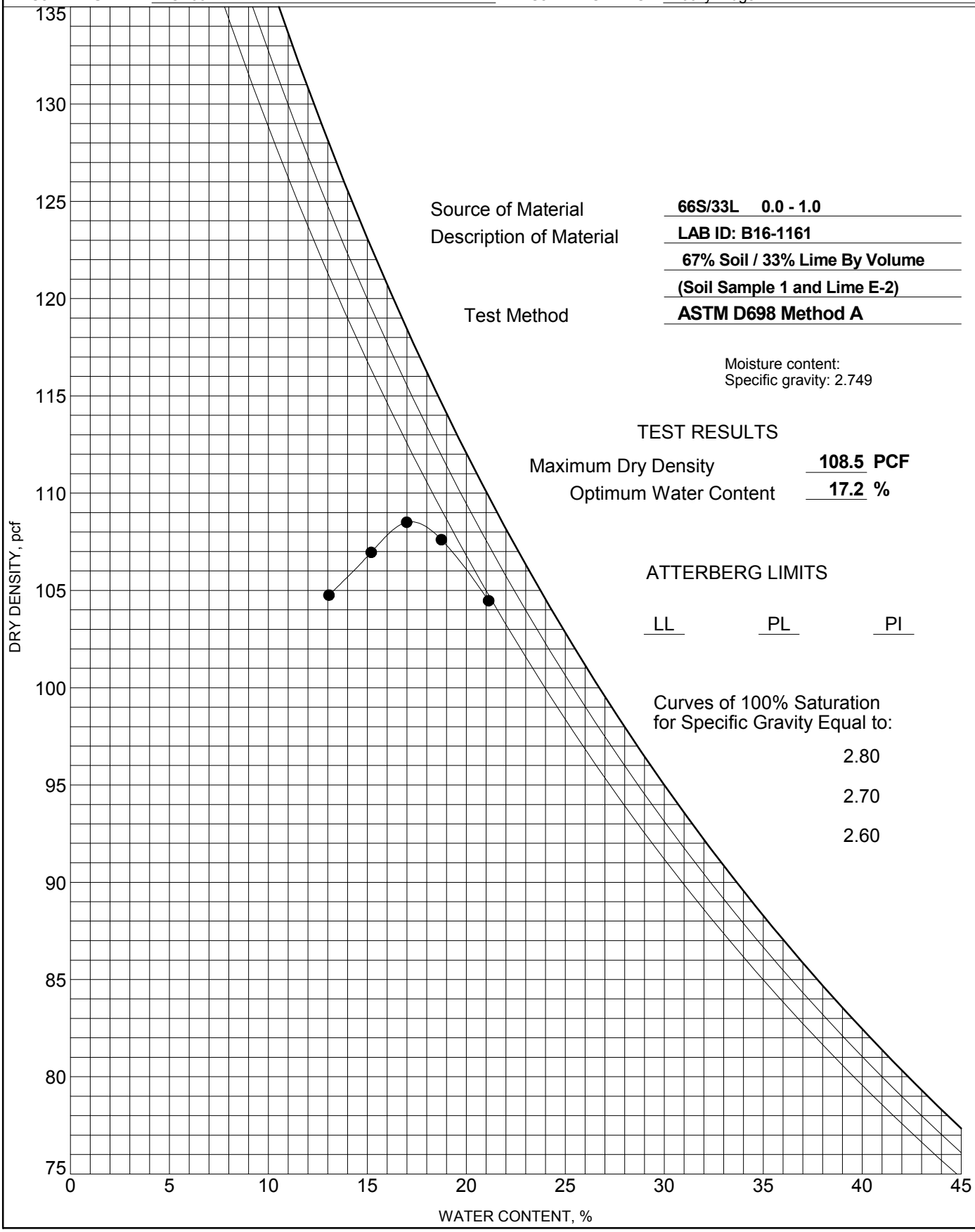
Curves of 100% Saturation for Specific Gravity Equal to:

2.80
2.70
2.60

Hull & Associates, Inc.
4 Hemishpere Way
Bedford, Ohio 44146
Telephone (440) 232-9945
Fax (440) 232-9946

MOISTURE-DENSITY RELATIONSHIP

CLIENT Rocky Ridge Development
PROJECT NAME Material Blending
PROJECT NUMBER RCK001
PROJECT LOCATION Rocky Ridge



Source of Material: **66S/33L 0.0 - 1.0**
Description of Material: **LAB ID: B16-1161**
67% Soil / 33% Lime By Volume
(Soil Sample 1 and Lime E-2)
Test Method: **ASTM D698 Method A**

Moisture content:
Specific gravity: 2.749

TEST RESULTS

Maximum Dry Density **108.5** **PCF**
Optimum Water Content **17.2** **%**

ATTERBERG LIMITS

LL	PL	PI

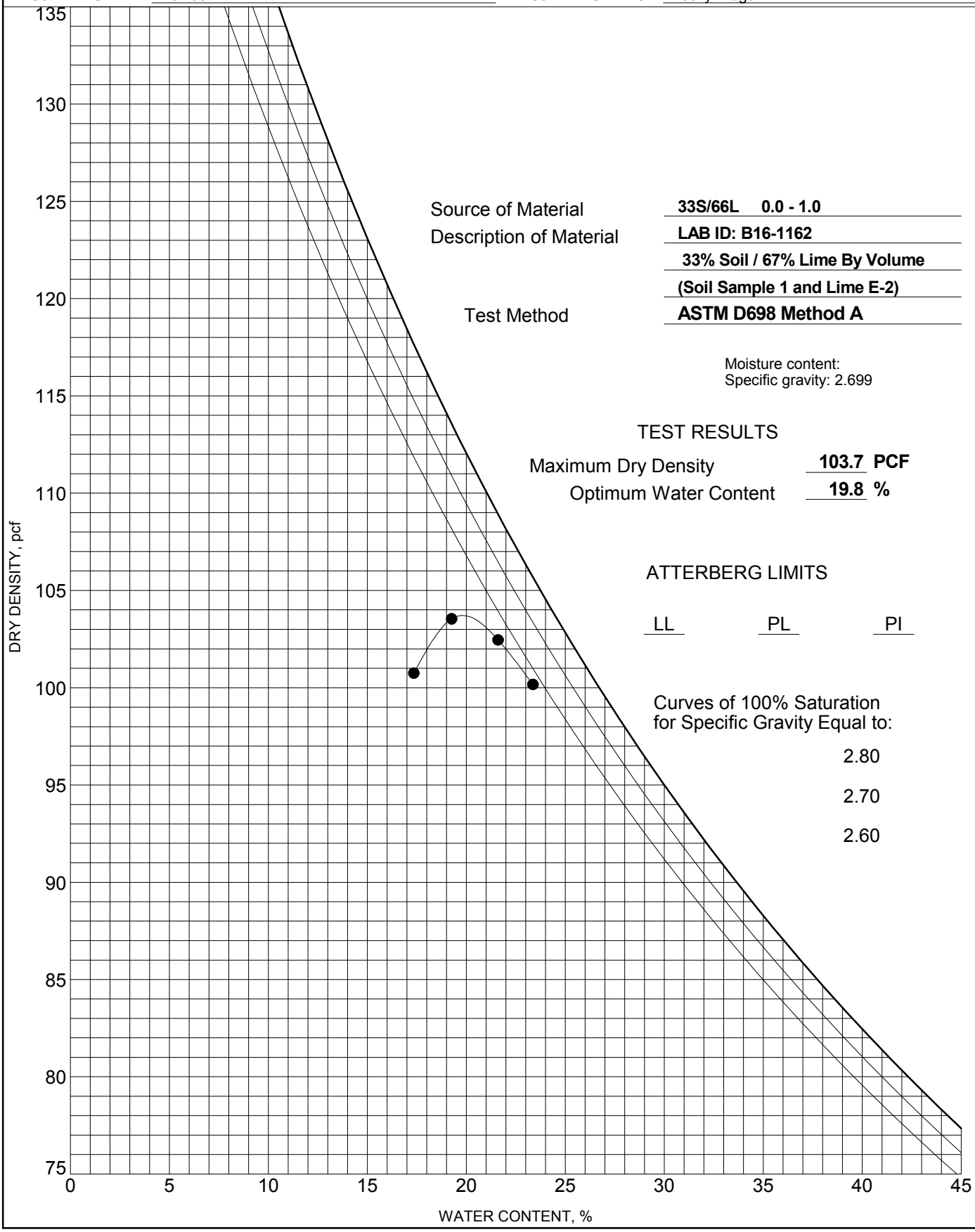
Curves of 100% Saturation for Specific Gravity Equal to:

2.80
2.70
2.60

Hull & Associates, Inc.
4 Hemishpere Way
Bedford, Ohio 44146
Telephone (440) 232-9945
Fax (440) 232-9946

MOISTURE-DENSITY RELATIONSHIP

CLIENT Rocky Ridge Development
PROJECT NAME Material Blending
PROJECT NUMBER RCK001
PROJECT LOCATION Rocky Ridge



Source of Material: **33S/66L 0.0 - 1.0**
Description of Material: **LAB ID: B16-1162**
33% Soil / 67% Lime By Volume
(Soil Sample 1 and Lime E-2)
Test Method: **ASTM D698 Method A**

Moisture content:
Specific gravity: 2.699

TEST RESULTS

Maximum Dry Density **103.7** **PCF**
Optimum Water Content **19.8** **%**

ATTERBERG LIMITS

LL	PL	PI

Curves of 100% Saturation for Specific Gravity Equal to:

2.80
2.70
2.60

COMPACTION - GINT STD US LAB 2014.GDT - 6/10/16 09:19 - F:\CLIENTS\ACTIVE\GINT\PROJECTS\RCK001.GPJ

ATTACHMENT C

Geotechnical Laboratory Reports
(Permeability Test Results of Blended Material)

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER

ASTM D5084-00 Method F; Mercury U-Tube Permometer - Inflow Volume = Outflow Volume

Client	Hull & Associates, Inc.	Boring	NA
Client Project	Rocky Ridge Development	Depth	NA
Project No.	37424	Sample	B16-1160
Visual Description	50% Soil/ 50% Lime	Lab Sample No.	37424001
Sample Condition	Remolded		

SAMPLE CONDITIONS		
Sample Status	Initial	Final
Tare Number	B08	101
Wt. Tare & WS, gm	178.8	719.48
Wt. Tare & DS, gm	162.45	588.44
Wt. Tare, gm	83.6	83.09
Moisture Content, %	20.7%	25.9%
Wt. Tube & WS., gm	615.6	NA
Wt. Of Tube, gm	0	NA
Wt. Of WS., gm	615.6	642.1
Length 1, in	3	3.045
Length 2, in	3	3.039
Length 3, in	3	3.052
Top Diameter, in	2.864	2.894
Middle Diameter, in	2.865	2.875
Bottom Diameter, in	2.8655	2.872
Average Length, **L**, cm	7.62	7.74
Average Area, **A**, cm^2	41.59	42.04
Sample Volume, cc	316.9	325.2
Unit Wet Wt., gm/cc	1.94	1.97
Unit Wet Wt., pcf	121.2	123.2
Unit Dry Wt., pcf	100.4	97.8
Unit Dry Wt., gm/cc	1.61	1.57
Specific Gravity, Assumed	2.7	2.7
Void Ratio, e	0.678	0.722
Porosity, n	0.404	0.419
Pore Volume, cc	128.05	136.33
Saturation, %	82.6%	

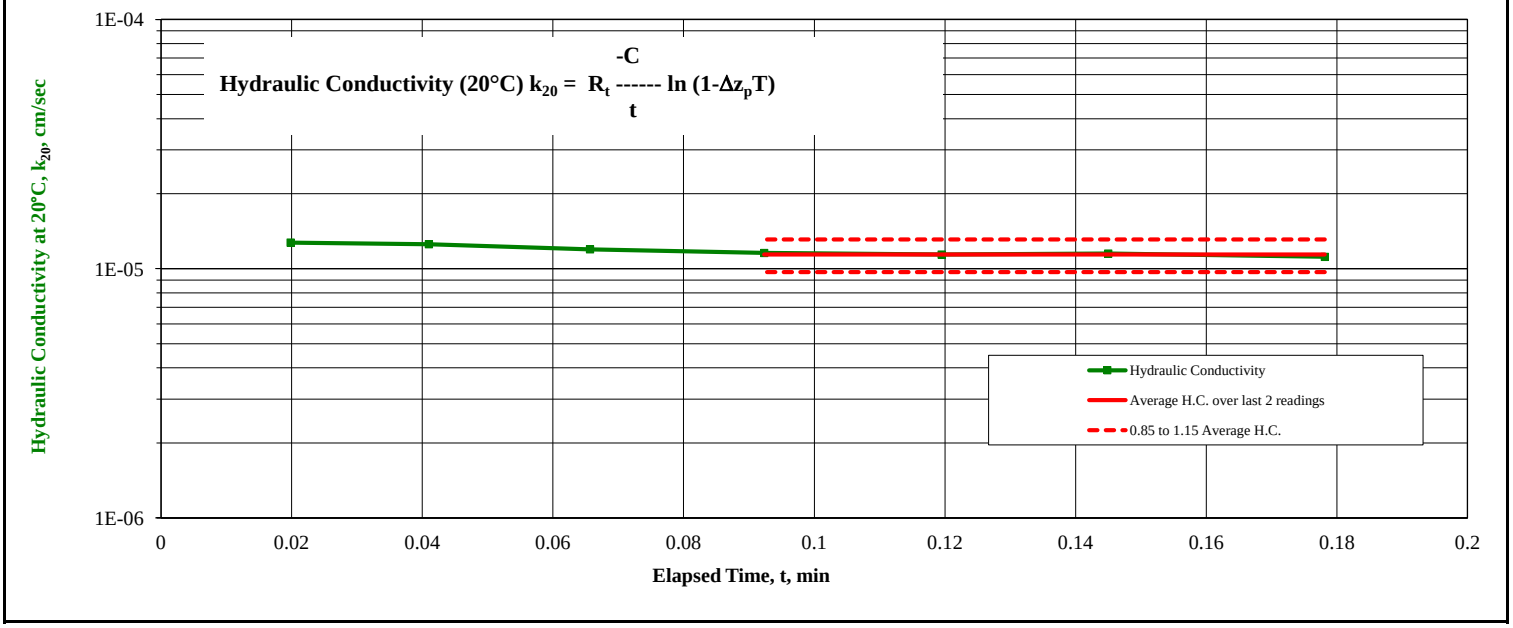
TEST CONSTANTS & EQUATIONS	
Pipette Area, $\mathbf{a_n}$ - cm^2	0.031416
Annulus Area, $\mathbf{a_a}$, cm^2	0.76712
Manometer Constant, $\mathbf{M_1} = a_a a_n/(a_a+a_n)$, cm^2	0.03018
Manometer Constant, $\mathbf{M_2} = 1 + a_p/a_a$	1.0410
Sample Constant, $\mathbf{S} = L/A$, cm^{-1}	0.184
Specific Gravity, $\boldsymbol{\delta} = \delta_{hg} - \delta_w$, gm/cc	12.562
Test Constant, $\mathbf{C} = M_1 S/\delta$	4.42E-04
Mercury Level at Equilibrium, $\mathbf{R_{eq}}$, cm	3.6
Mercury Level of Pipette at t=0, $\mathbf{R_{p0}}$, cm	6.5
Initial Head Difference, $\mathbf{z_1} = (R_{p0}-R_{eq})M_2$, cm	3.02
Trial Constant, $\mathbf{T} = M_2 / z_1$, cm	0.3448
Temperature Correction for 20°C, $\mathbf{R_t}$	0.976

SAMPLE SUMMARY	
Avg. Hydraulic Conductivity, k_{20}, cm/sec	**1.1E-05**
Initial Water Content, %	20.7%
Initial Dry Density, pcf	100.4
% Compaction	95.0%
Sample Status	Remolded
B Parameter	96
Permeant	Deaired Water
Cell Pressure, psi	105
Back Pressure, psi	100
Avg.(Mid-Height) Confining Stress, psi	5
Maximum Gradient	4.9
Average Test Temperature, °C	21.0

TEST DATA

t_i Elapsed Time	R_{pt} Mercury Height	Δz_p R_{p0}-R_{pt}	i Gradient	H_t Head	ΔH_t Percent of Initial Head from t=0	σ'_{max} Effective Stress Max	σ'_{min} Effective Stress Min	k_{20} Hydraulic Conductivity
min	*cm*	*cm*	*cm / cm*	*cm*	*%*	*psi*	*psi*	*cm/sec*
0.00	6.5	0	4.9	37.9	100.0%	5.27	4.73	NA
0.02	6.4	0.1	4.7	36.6	96.6%	5.26	4.74	1.27E-05
0.04	6.3	0.2	4.6	35.3	93.1%	5.25	4.75	1.25E-05
0.07	6.2	0.3	4.4	34.0	89.7%	5.24	4.76	1.20E-05
0.09	6.1	0.4	4.2	32.7	86.2%	5.23	4.77	1.16E-05
0.12	6	0.5	4.1	31.4	82.8%	5.22	4.78	1.14E-05
0.15	5.9	0.6	3.9	30.1	79.3%	5.21	4.79	1.15E-05
0.18	5.8	0.7	3.7	28.8	75.9%	5.20	4.80	1.12E-05

ELAPSED TIME vs. HYDRAULIC CONDUCTIVITY



Input Validation: ALO Reviewed By: SVG Date Tested: 6/2/2016

Note: The average Hydraulic Conductivity is calculated using the average of the last 4 determinations where all requisite flow and Hydraulic Conductivity conditions are achieved!

Prerequisits: Inflow / Outflow Ratio = 1 by definition of test procedure. Final Hydraulic Conductivity = +-25% of average Hydraulic Conductivity when k > 1E-8 cm/sec and +-50% when k < 1E-8 cm/sec.

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER

ASTM D5084-00 Method F; Mercury U-Tube Permometer - Inflow Volume = Outflow Volume

Client	Hull & Associates, Inc.	Boring	NA
Client Project	Rocky Ridge Development	Depth	NA
Project No.	37424	Sample	B16-1161
Visual Description	67% Soil/ 33% Lime	Lab Sample No.	37424002
Sample Condition	Remolded		

SAMPLE CONDITIONS		
Sample Status	Initial	Final
Tare Number	N77	43
Wt. Tare & WS, gm	48.58	720.25
Wt. Tare & DS, gm	42.08	605.79
Wt. Tare, gm	8.24	82.44
Moisture Content, %	19.2%	21.9%
Wt. Tube & WS., gm	624.3	NA
Wt. Of Tube, gm	0	NA
Wt. Of WS., gm	624.3	638.2
Length 1, in	3	2.971
Length 2, in	3	2.984
Length 3, in	3	2.947
Top Diameter, in	2.864	2.845
Middle Diameter, in	2.865	2.843
Bottom Diameter, in	2.8655	2.868
Average Length, **L**, cm	7.62	7.54
Average Area, **A**, cm^2	41.59	41.22
Sample Volume, cc	316.9	310.6
Unit Wet Wt., gm/cc	1.97	2.05
Unit Wet Wt., pcf	122.9	128.2
Unit Dry Wt., pcf	103.1	105.2
Unit Dry Wt., gm/cc	1.65	1.69
Specific Gravity, Assumed	2.7	2.7
Void Ratio, e	0.634	0.602
Porosity, n	0.388	0.376
Pore Volume, cc	122.94	116.69
Saturation, %	81.8%	

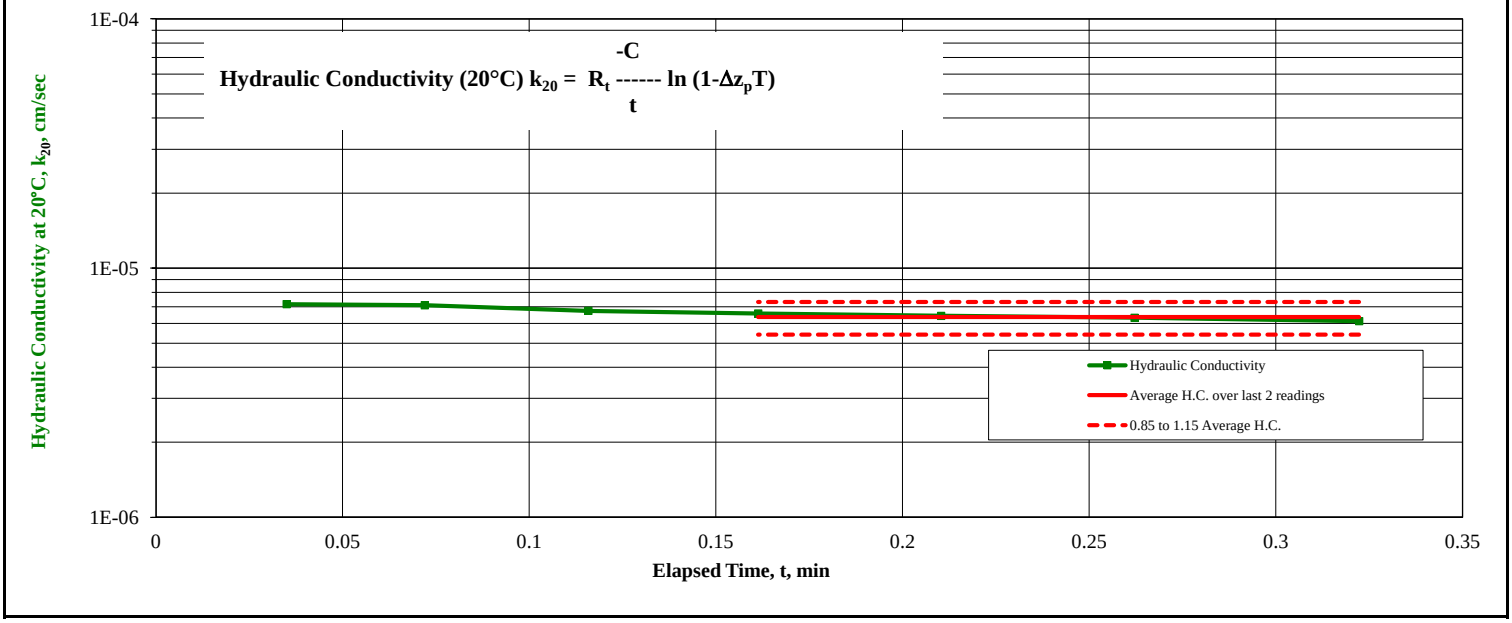
TEST CONSTANTS & EQUATIONS	
Pipette Area, $\mathbf{a_n}$ - cm^2	0.031416
Annulus Area, $\mathbf{a_a}$, cm^2	0.76712
Manometer Constant, $\mathbf{M_1} = a_a a_n/(a_a+a_n)$, cm^2	0.03018
Manometer Constant, $\mathbf{M_2} = 1 + a_p/a_a$	1.0410
Sample Constant, $\mathbf{S} = L/A$, cm^{-1}	0.183
Specific Gravity, $\boldsymbol{\delta} = \delta_{hg} - \delta_w$, gm/cc	12.562
Test Constant, $\mathbf{C} = M_1 S/\delta$	4.39E-04
Mercury Level at Equilibrium, $\mathbf{R_{eq}}$, cm	3.6
Mercury Level of Pipette at t=0, $\mathbf{R_{p0}}$, cm	6.5
Initial Head Difference, $\mathbf{z_1} = (R_{p0}-R_{eq})M_2$, cm	3.02
Trial Constant, $\mathbf{T} = M_2 / z_1$, cm	0.3448
Temperature Correction for 20°C, $\mathbf{R_t}$	0.976

SAMPLE SUMMARY	
Avg. Hydraulic Conductivity, k_{20}, cm/sec	**6.4E-06**
Initial Water Content, %	19.2%
Initial Dry Density, pcf	103.1
% Compaction	95.0%
Sample Status	Remolded
B Parameter	97
Permeant	Deaired Water
Cell Pressure, psi	105
Back Pressure, psi	100
Avg.(Mid-Height) Confining Stress, psi	5
Maximum Gradient	5.0
Average Test Temperature, °C	21.0

TEST DATA

t_i Elapsed Time	R_{pt} Mercury Height	Δz_p R_{p0}-R_{pt}	i Gradient	H_t Head	ΔH_t Percent of Initial Head from t=0	σ'_{max} Effective Stress Max	σ'_{min} Effective Stress Min	k_{20} Hydraulic Conductivity
min	*cm*	*cm*	*cm / cm*	*cm*	*%*	*psi*	*psi*	*cm/sec*
0.00	6.5	0	5.0	37.9	100.0%	5.27	4.73	NA
0.04	6.4	0.1	4.9	36.6	96.6%	5.26	4.74	7.17E-06
0.07	6.3	0.2	4.7	35.3	93.1%	5.25	4.75	7.09E-06
0.12	6.2	0.3	4.5	34.0	89.7%	5.24	4.76	6.74E-06
0.16	6.1	0.4	4.3	32.7	86.2%	5.23	4.77	6.58E-06
0.21	6	0.5	4.2	31.4	82.8%	5.22	4.78	6.43E-06
0.26	5.9	0.6	4.0	30.1	79.3%	5.21	4.79	6.32E-06
0.32	5.8	0.7	3.8	28.8	75.9%	5.20	4.80	6.13E-06

ELAPSED TIME vs. HYDRAULIC CONDUCTIVITY



Input Validation: ALO Reviewed By: SVG Date Tested: 6/3/2016

Note: The average Hydraulic Conductivity is calculated using the average of the last 4 determinations where all requisite flow and Hydraulic Conductivity conditions are achieved!

Prerequisits: Inflow / Outflow Ratio = 1 by definition of test procedure. Final Hydraulic Conductivity = +-25% of average Hydraulic Conductivity when k > 1E-8 cm/sec and +-50% when k < 1E-8 cm/sec.

MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER

ASTM D5084-00 Method F; Mercury U-Tube Permometer - Inflow Volume = Outflow Volume

Client	Hull & Associates, Inc.	Boring	NA
Client Project	Rocky Ridge Development	Depth	NA
Project No.	37424	Sample	B16-1162
Visual Description	33% Soil/ 67% Lime	Lab Sample No.	37424003
Sample Condition	Remolded		

SAMPLE CONDITIONS		
Sample Status	Initial	Final
Tare Number	V13	456
Wt. Tare & WS, gm	55.96	701.46
Wt. Tare & DS, gm	47.33	579.85
Wt. Tare, gm	7.98	85.46
Moisture Content, %	21.9%	24.6%
Wt. Tube & WS., gm	608.1	NA
Wt. Of Tube, gm	0	NA
Wt. Of WS., gm	608.1	621.4
Length 1, in	3	2.96
Length 2, in	3	2.965
Length 3, in	3	2.981
Top Diameter, in	2.864	2.827
Middle Diameter, in	2.865	2.838
Bottom Diameter, in	2.8655	2.865
Average Length, **L**, cm	7.62	7.54
Average Area, **A**, cm^2	41.59	40.96
Sample Volume, cc	316.9	308.9
Unit Wet Wt., gm/cc	1.92	2.01
Unit Wet Wt., pcf	119.7	125.5
Unit Dry Wt., pcf	98.2	100.7
Unit Dry Wt., gm/cc	1.57	1.61
Specific Gravity, Assumed	2.7	2.7
Void Ratio, e	0.716	0.672
Porosity, n	0.417	0.402
Pore Volume, cc	132.18	124.18
Saturation, %	82.7%	

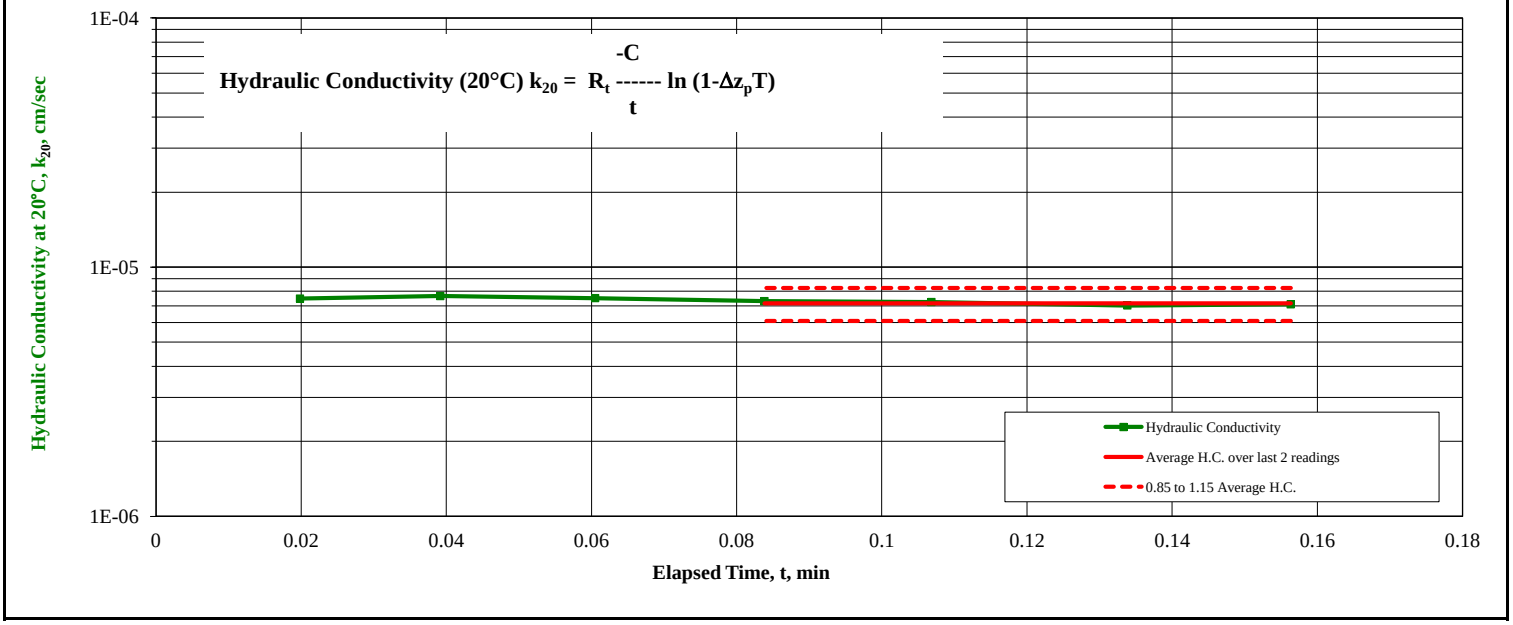
TEST CONSTANTS & EQUATIONS	
Pipette Area, $\mathbf{a_n}$ - cm^2	0.031416
Annulus Area, $\mathbf{a_a}$, cm^2	0.76712
Manometer Constant, $\mathbf{M_1} = a_a a_n/(a_a+a_n)$, cm^2	0.03018
Manometer Constant, $\mathbf{M_2} = 1 + a_p/a_a$	1.0410
Sample Constant, $\mathbf{S} = L/A$, cm^{-1}	0.184
Specific Gravity, $\boldsymbol{\delta} = \delta_{hg} - \delta_w$, gm/cc	12.562
Test Constant, $\mathbf{C} = M_1 S/\delta$	4.42E-04
Mercury Level at Equilibrium, $\mathbf{R_{eq}}$, cm	3.6
Mercury Level of Pipette at t=0, $\mathbf{R_{p0}}$, cm	8.5
Initial Head Difference, $\mathbf{z_1} = (R_{p0}-R_{eq})M_2$, cm	5.10
Trial Constant, $\mathbf{T} = M_2 / z_1$, cm	0.2041
Temperature Correction for 20°C, $\mathbf{R_t}$	0.976

SAMPLE SUMMARY	
Avg. Hydraulic Conductivity, k_{20}, cm/sec	**7.2E-06**
Initial Water Content, %	21.9%
Initial Dry Density, pcf	98.2
% Compaction	94.7%
Sample Status	Remolded
B Parameter	97
Permeant	Deaired Water
Cell Pressure, psi	105
Back Pressure, psi	100
Avg.(Mid-Height) Confining Stress, psi	5
Maximum Gradient	8.5
Average Test Temperature, °C	21.0

TEST DATA

t_i Elapsed Time	R_{pt} Mercury Height	Δz_p R_{p0}-R_{pt}	i Gradient	H_t Head	ΔH_t Percent of Initial Head from t=0	σ'_{max} Effective Stress Max	σ'_{min} Effective Stress Min	k_{20} Hydraulic Conductivity
min	*cm*	*cm*	*cm / cm*	*cm*	*%*	*psi*	*psi*	*cm/sec*
0.00	8.5	0	8.5	64.1	100.0%	5.46	4.54	NA
0.02	8.4	0.1	8.3	62.8	98.0%	5.45	4.55	7.48E-06
0.04	8.3	0.2	8.2	61.5	95.9%	5.44	4.56	7.65E-06
0.06	8.2	0.3	8.0	60.2	93.9%	5.43	4.57	7.51E-06
0.08	8.1	0.4	7.8	58.8	91.8%	5.42	4.58	7.31E-06
0.11	8	0.5	7.6	57.5	89.8%	5.41	4.59	7.25E-06
0.13	7.9	0.6	7.5	56.2	87.8%	5.40	4.60	7.02E-06
0.16	7.8	0.7	7.3	54.9	85.7%	5.39	4.61	7.09E-06

ELAPSED TIME vs. HYDRAULIC CONDUCTIVITY



Input Validation: ALO Reviewed By: SVG Date Tested: 6/4/2016

Note: The average Hydraulic Conductivity is calculated using the average of the last 4 determinations where all requisite flow and Hydraulic Conductivity conditions are achieved!

Prerequisits: Inflow / Outflow Ratio = 1 by definition of test procedure. Final Hydraulic Conductivity = +-25% of average Hydraulic Conductivity when k > 1E-8 cm/sec and +-50% when k < 1E-8 cm/sec.

APPENDIX ~~G~~F-2

Report of Geotechnical Laboratory Testing Services
Investigation of Lime Sludge Utilization
Collins Park WTP ~~Spent Lime~~DWTMDWTM
(prepared by TTL; dated July 22, 2014)

1915 North 12th Street
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July 22, 2014 **TTL Project No. 11788.01**

Mr. Scott Stansley
Stansley Industries, Inc.
5648 Main Street, Suite 3
Sylvania, Ohio 43560

Report of
Geotechnical Laboratory Testing Services
Investigation of Lime Sludge Utilization
Collins Park WTP Spent Lime
Toledo, Ohio

Dear Mr. Stansley:

TTL Associates, Inc. (TTL) has completed the geotechnical laboratory testing services associated with the referenced project. The laboratory services were performed in general accordance with Phase 1 – Testing of Soil/Lime Sludge "Design" Mixtures presented in TTL Proposal No. 11788.01, dated June 19, 2014. This phase of the proposal was authorized by you on June 20, 2014.

The purpose of this study was to conduct strength, compressibility, and subgrade support characteristics testing for compacted cohesive soil samples mixed with varying percentages of lime sludge. This report summarizes the testing procedures, presents the findings, as well as discusses our evaluations and conclusions.

PROJECT DESCRIPTION

We understand that Stansley Industries, Inc. (Stansley) is planning to utilize lime sludge from the City of Toledo (COT) Collins Park Water Treatment Plant (WTP) for applications other than traditional ag-lime uses. One such application involves mixing the lime sludge with cohesive soils and placing the blended material as non-structural fill. Although the fill will not be utilized to support structures, there are concerns related to long-term settlement.

It is our understanding that the lime sludge and clay will be mixed in-place at the fill site, primarily by spreading with dozers, to blend the material into a sludge-soil composite material. We understand that the lime sludge is typically end-dumped and spread to dry by natural aeration, prior to mixing with the clay, and thereafter, with final spreading, mixing of the clay, and tracking with a dozer. Within the context of this study, the applications are considered to be non-structural, or placement for general fill without subsequent engineering

purposes or building/roadway construction. We further understand that the mixed material will not generally be disced nor placed with compaction equipment (e.g., a sheepsfoot or smooth-drum roller), and controlled fill compaction techniques such as in-place density testing would not be performed.

LABORATORY TESTING PROCEDURES

Five bulk samples of clay and four bulk samples of lime sludge were delivered in 5-gallon buckets to the TTL Toledo soils laboratory by Stansley on July 1, 2014. Based on visual observation by TTL, four of the clay bucket samples appeared to be similar in soil texture/consistency, but one clay bucket sample appeared to vary somewhat from the other four bucket samples. The variable clay bucket sample was not used for testing. TTL mixed a composite sample of clay from the four buckets of clay, and a composite sample of lime sludge from the four buckets of lime sludge. "As-received" moisture contents determinations (ASTM D 2216) were performed on the composite samples of clay and lime sludge.

TTL mixed lime sludge into clay specimens at three varying percentages for evaluation of soil/lime mixture characteristics. The mix percentages were 8, 25, and 35 percent lime sludge, calculated on a dry weight basis. Additionally, the clay soil was characterized for index properties, and re-compacted samples (without lime sludge) were tested for comparison. Based on the results of particle size analysis and Atterberg Limit tests, the clay sample was determined to be a sandy silty clay (Unified Soil Classification System [USCS] designation: CL-ML). The tested soil sample was 57 percent silt-clay (finer than No. 200 sieve) and 43 percent sand (including trace fine gravel), with a plasticity index of 4 percent, indicative of a low plasticity clay.

For each of the three soil/lime mixtures, as well as the clay soil without lime sludge, a Standard Proctor moisture-density relationship test (ASTM D 698) was performed. This study included additional tests performed on re-compacted specimens. The test specimens were re-compacted to 100 percent of the maximum dry density (MDD) at approximately optimum moisture content (OMC) as determined from the Standard Proctor test results.

For each of the three soil/lime mixtures, three specimens were re-compacted for unconfined compressive tests (ASTM D 5102), cured for a period of 3 days, moisture conditioned for a period of approximately 24 hours, and then tested for compressive strength. It should be noted that the typical 7-day curing period prescribed by ODOT Supplement 1120 "Mixture Design for Chemically Stabilized Soils" was reduced to 3 days for this project, in the interest of schedule and with consideration that this investigation is not targeted specifically for roadway subgrade stabilization. Additionally, no freeze-thaw testing of the specimens was performed.

For the clay soil without lime sludge, an Atterberg limits test (ASTM D 4318), a particle size analysis (ASTM D 422), and unconfined compressive strength tests (ASTM D 2166) on three re-compacted specimens were performed.

California Bearing Ratio (CBR) tests (ASTM D 1883) were performed on re-compacted specimens containing 8 percent lime sludge and 35 percent lime sludge. For comparison, the CBR tests were performed without a soaking period or surcharge, and with a 96-hour soaking period with a surcharge of 10 pounds.

One-dimensional consolidation tests (ASTM D 2435) were performed on re-compacted specimens containing 8 percent lime sludge and 35 percent lime sludge. The compacted specimen containing 35 percent lime sludge was approximately 1 percent wet of OMC and was compacted to 99 percent of the MDD.

Results of the laboratory tests are summarized in the following section, and are attached to this report.

LABORATORY TEST RESULTS

"As-received" moisture contents performed on the composite samples of clay and lime sludge were determined to be 11.8 percent and 51.7 percent, respectively. It should be noted that natural moisture contents of clays may vary with source material, seasonal conditions, and whether the clay is freshly excavated or stockpiled. Similarly, the moisture content of the sludge will vary, depending on:

- the elapsed time since the material was excavated or stockpiled,
- the depth of excavation at the stockpile source, and/or
- the depth and time duration of the drying layers and the placement/mixing location.

As previously discussed, the source clay furnished for this study was determined to be a sandy silty clay (USCS: CL-ML) with trace gravel, having a plasticity index of 4 percent, indicative of a low plasticity clay. Other clays in the Toledo area may exhibit higher clay fraction and higher plasticity, and such clays would typically exhibit higher natural moisture contents. These properties would likely affect the strength, compaction, and compressibility of the soil-sludge mixtures, the degree to which is expected to vary somewhat with sludge percentage.

The testing for this study was performed in general accordance with ASTM standards. To meet ASTM laboratory controls and methods, the test specimens were prepared on a dry weight basis with systematic attention given to percentage of lime sludge, compaction, and moisture content. We understand that field blending and placement of the clay with lime sludge will be performed on a weight basis, presumably by volumetric estimates, and without precise weight controls compared to laboratory preparation and compaction. The "quality" and consistency of the field-mixed materials will depend on the care and diligence exercised during blending and placement to provide a homogeneous mixture of clay and lime sludge. Nonetheless, the results of the laboratory testing program summarized below provide meaningful evaluations into the behavior of the soil-sludge mixtures and comparative data with respect to the relative percentages of sludge.

Results of the Standard Proctor tests are summarized in the following table.

Standard Proctor Test Results			
Clay/Lime Sludge Mixture	**Maximum Dry Density (pcf)**	**Optimum Moisture Content (percent)**	**Total (Wet) Unit Weight[1] (pcf)**
Clay only - no Lime Sludge	119.1	13.0[2]	134.6
Clay with 8% Lime Sludge	116.8	13.2	132.2
Clay with 25% Lime Sludge	105.1	19.7	125.8
Clay with 35% Lime Sludge	100.3	22.5	122.9

[1]Calculated at 100 percent of MDD at OMC.
[2]The "as-received" moisture content for the composite clay sample was determined to be 11.8 percent.

Results of the CBR tests are summarized in the following table.

CBR Test Results		
Clay/Lime Sludge Mixture	**CBR Value (percent)**	
	No Soak or Surcharge	**96-Hour Soak and 10-lb Surcharge**
Clay with 8% Lime Sludge	11.5	8.8
Clay with 35% Lime Sludge	3.1	3.1

Note: Based on ODOT correlations with gradation and index properties, a CBR value of 7 percent was estimated for the provided clay (without lime sludge).

Results of the one-dimensional consolidation tests are summarized in the following table.

One-Dimensional Consolidation Test Results			
Clay/Lime Sludge Mixture	**Initial Void Ratio (e_o)**	**Compression Index (C_c)**	**Recompression Index (C_r)**
Clay with 8% Lime Sludge	0.45	0.09	0.018
Clay with 35% Lime Sludge	0.66	0.15	0.032

Results of the unconfined compressive strength tests are summarized in the following table.

Unconfined Compressive Strength (UCS) Test Results			
Clay/Lime Sludge Mixture	**Range of UCS Results (psi)**	**Average UCS Value**	
		(psi)	**(tsf)**
Clay only - no Lime Sludge	19.9 to 26.3	22.6	1.63
Clay with 8% Lime Sludge	17.5 to 23.9	19.9	1.43
Clay with 25% Lime Sludge	13.5 to 18.3	15.9	1.14
Clay with 35% Lime Sludge	14.3 to 15.9	15.1	1.09

EVALUATIONS AND ASSESSMENTS

The testing for this study was performed to evaluate strength, compaction, and compressibility of various clay-sludge mixtures for purposes of assessing general (non-structural) fill applications. Care and diligence will be required during mixing and placement to provide a homogeneous mixture of soil and lime sludge.

Compaction

Placement of the material is anticipated to consist of tracking with a dozer. As with any fill, the stability of the fill depends on the effort used to place the fill. Based on our test results, the optimum moisture content increases and the total (wet) unit weight decreases with increased lime sludge content. Regardless of the lime sludge content, discing and aeration may be required in addition to blending the materials to achieve a relatively stable layer of fill prior to placement of additional fill.

Strength

Based on the unconfined compressive strength tests, increasing the lime sludge content resulted in a reduction in strength. The magnitude of unconfined compressive strength would be less for a fill with the same clay/lime sludge mixture as the tested specimens compacted to less than 100 percent of the MDD. However, for fill placed with construction equipment, the strength of the fill should be suitable for the intended non-structural use.

A lower CBR value was determined for the tested specimen with the higher lime sludge content of 35 percent compared to what would be expected for the un-modified clay. The CBR for the tested sample was characteristic of wet, higher plasticity clay. In using the higher lime sludge content, the subgrade may be more susceptible to moisture. Care and diligence will be required to maintain a subgrade that is suitable for tracking, spreading, and mixing the fill materials.

Settlement

Based on the one-dimensional consolidation test results, we evaluated settlement of varying thicknesses of clay/lime sludge fill under its own weight. Additionally, settlement of clay without lime sludge was evaluated based on published correlations of plasticity with consolidation parameters. Settlement was calculated by considering 10 feet and 20 feet of fill, and the results of our analyses are summarized in the following table.

Embankment Fill Settlement Evaluation		
Clay/Lime Sludge Mixture	**Approximate Theoretical Settlement (inches)**	
	10-Foot Deep Fill	**20-Foot Deep Fill**
Native Clays (depending on plasticity)	1 to 2	2½ to 3½
Clay with 8% Lime Sludge	1½ to 2½	2½ to 3½
Clay with 35% Lime Sludge	2½ to 3½	3½ to 4½

All fill settles under its own weight. The settlement varies based on soil type and fill height. Settlement of the 8 percent lime sludge mixture was calculated to be within approximately ½ inch of the settlement associated with clay only. For the 35 percent lime sludge mixture, the

settlement was calculated to be within approximately 1 inch of the settlement calculated for the 8 percent lime sludge mixture.

CONCLUSIONS

1. Based on our evaluations, the clay mixed with up to 35 percent lime sludge (dry weight basis) is expected to provide a stable fill for non-structural use.
2. Settlement of fill under its own weight was calculated to be only approximately 1 to 2 inches greater than settlement associated with un-modified clay when considering 10 to 20 feet deep fills.
3. Performance of the fill will depend on the homogeneity of the clay/lime sludge mixture and the stability of each fill layer before additional fill is placed.

Untested soil and lime sludge samples will be stored at our laboratory for 90 days from the date of this report. The samples will be discarded after this time unless you request that they be saved or delivered to you.

Should you have any questions regarding this report or require additional information, please contact our office.

Sincerely,

TTL Associates, Inc.

Christopher P. Iott, P.E.
Senior Geotechnical Engineer

Curtis E. Roupe, P.E.
Vice President

Attachments: -Tabulation of Test Data
-Grain-Size Distribution Curve – Clay Sample
-Standard Proctor Moisture-Density Relationship Curves
-California Bearing Ratio (CBR) Test Results
-One-Dimensional Consolidation Test Results

T:\Geotech\Projects 2014\11788.01…\Report\11788.01 rpt Lime Sludge Utilization Collins Park WTP Toledo OH Stansley

PROJECT: Lime Sludge Utilization, Collins Park WTP Spent Lime, Toledo, Ohio	**TTL Associates, Inc.**	PROJECT NO: 11788.01

TABULATION OF TEST DATA

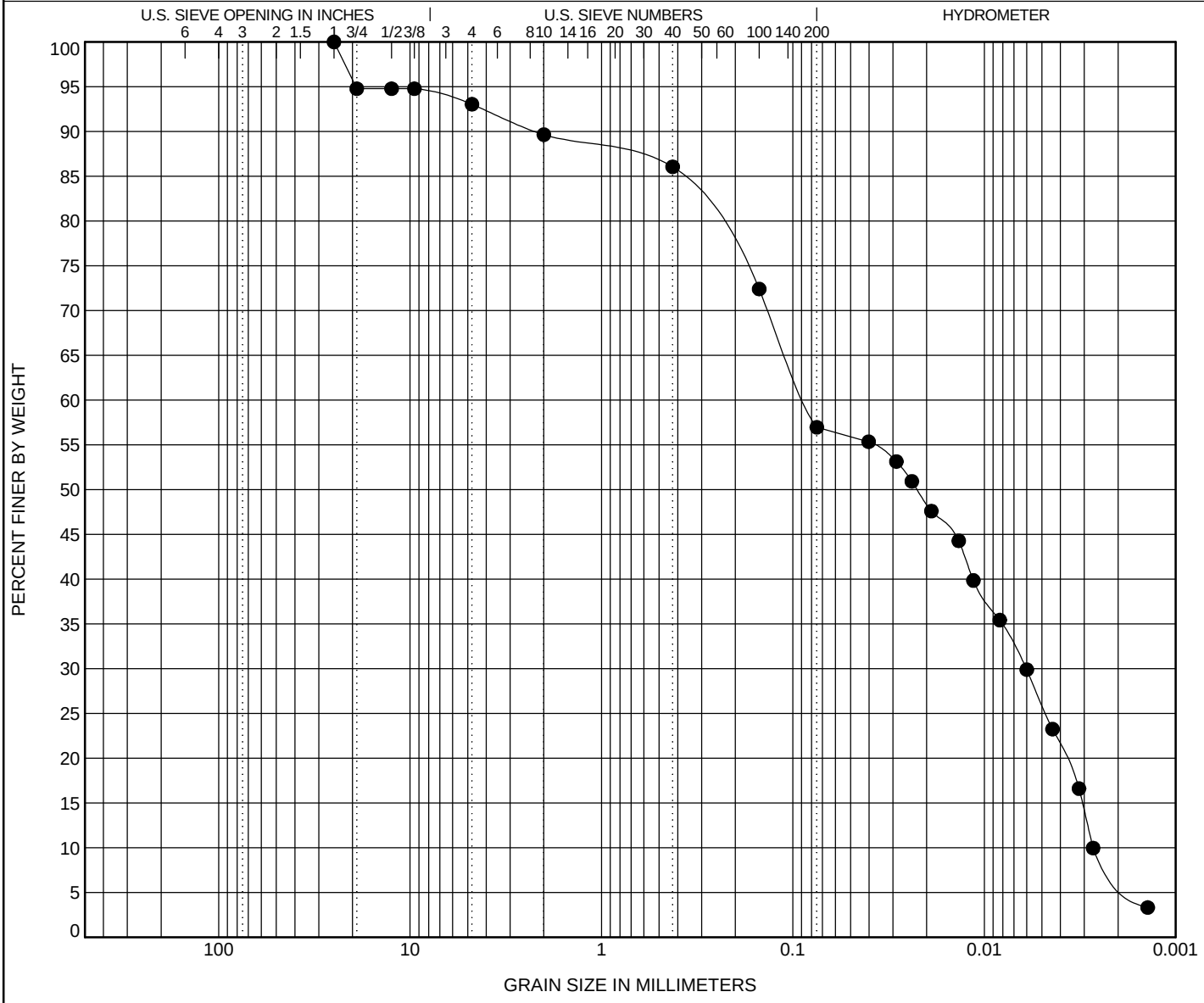
Sample ID	As-Received Moisture Content (% of Dry Weight)	Range of Unconfined Compressive Strength (Pounds per Square Inch)	Average Unconfined Compressive Strength (Pounds per Square Inch)	Maximum Dry Density (Pounds per Cubic Foot)	Optimum Moisture Content (Percent)		Particle Size Distribution (%)						Atterberg Limits (%)			Unified Soil Classification
							Gravel	Coarse Sand	Medium Sand	Fine Sand	Silt	Clay	Liquid Limit	Plastic Limit	Plasticity Index	
Clay without Lime Sludge	11.8	19.9 to 26.3	22.6	119.1	13.0		7	3	4	29	31	26	19	15	4	CL-ML
Clay mixed with 8% Lime Sludge		17.5 to 23.9	19.9	116.8	13.2											
Clay mixed with 25% Lime Sludge		13.5 to 18.3	15.9	105.1	19.7											
Clay mixed with 35% Lime Sludge		14.3 to 15.9	15.1	100.3	22.5											
Lime Sludge	51.7															

TTL Associates, Inc.
1915 N 12th Street
Toledo, Ohio 43624
Telephone: 419-324-2222
Fax: 419-241-1808

GRAIN SIZE DISTRIBUTION

CLIENT Stansley Industries, Inc. **PROJECT NAME** Lime Sludge Utilization

PROJECT NUMBER 11788.01 **PROJECT LOCATION** Toledo, OH

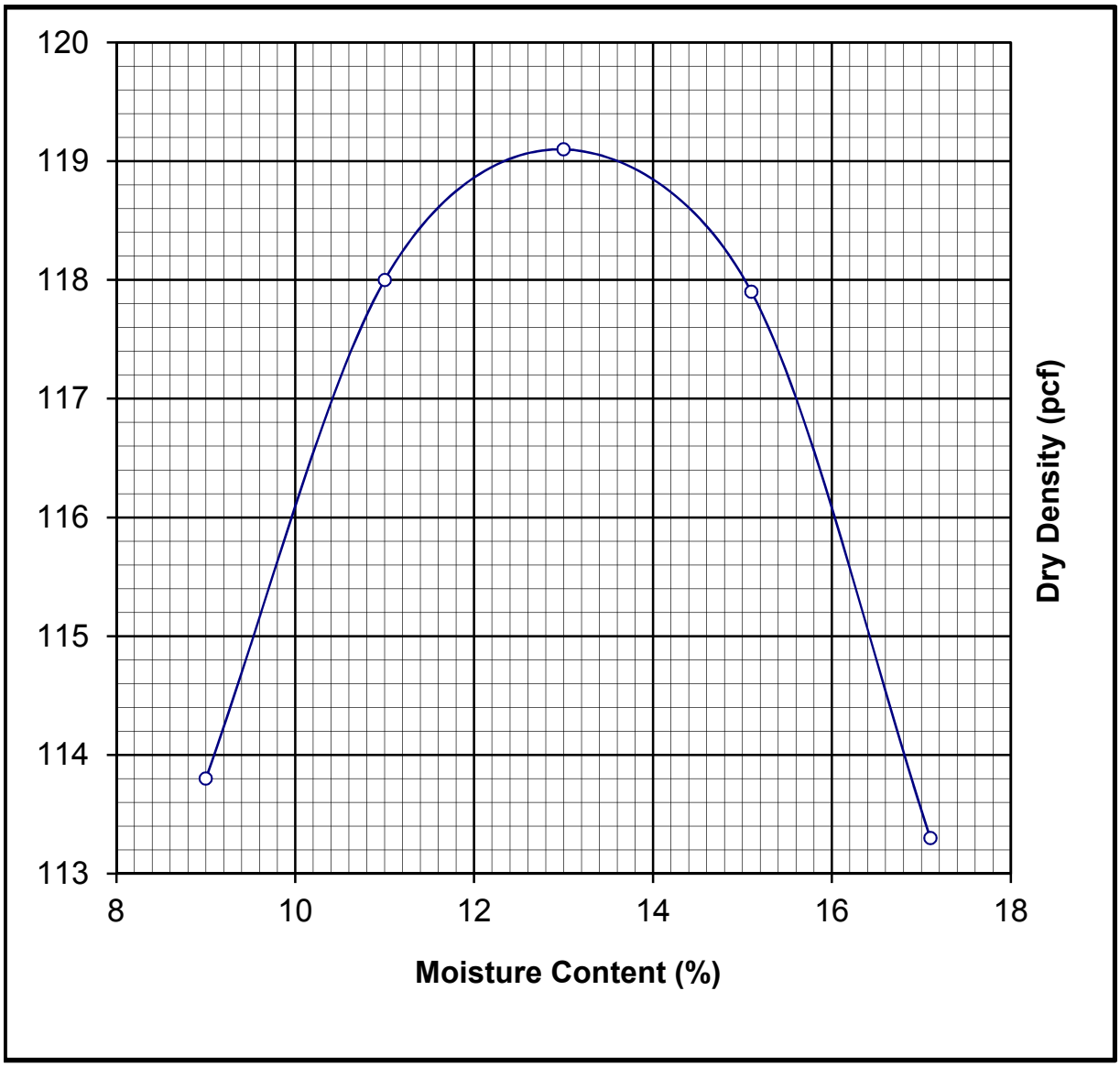


COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	USCS Classification	LL	PL	PI	Cc	Cu
● **Clay-No Sludge 0.0**	**SANDY SILTY CLAY (CL-ML)**	**19**	**15**	**4**	**0.2**	**31.8**

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **Clay-No Sludge 0.0**	**25**	**0.086**	**0.006**	**0.003**	**7.0**	**36.1**	**31.0**	**26.0**

MOISTURE-DENSITY RELATIONSHIP DATA

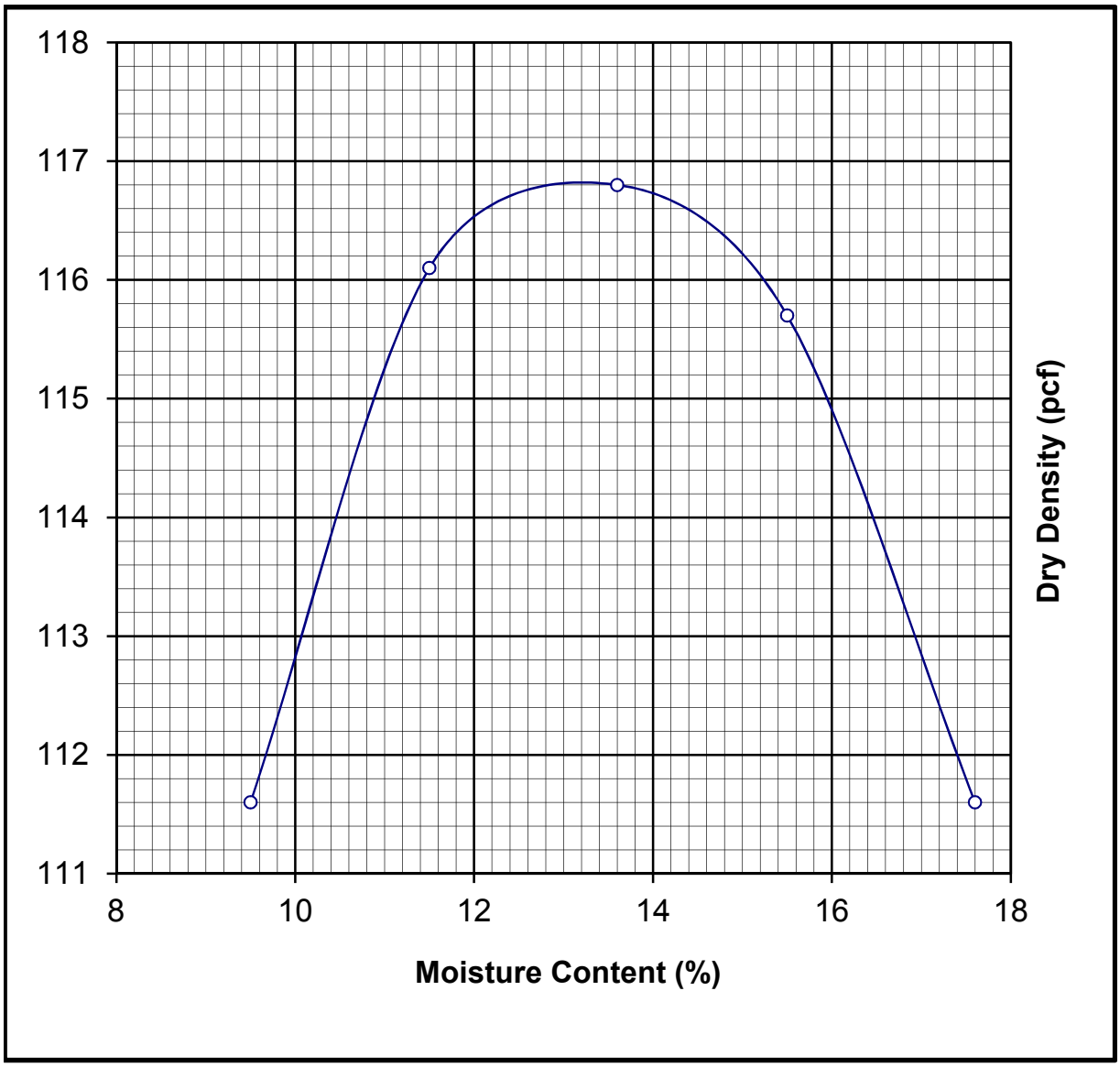


Project Number: 11788.01 Receiving Report No.: N/A Date: 07/02/14
Project: Lime Sludge Utilization
Collins Park WTP Spent Lime
Toledo, Ohio

Soil Description: Brown SANDY SILTY CLAY w/Trace Gravel (CL-ML)
Source: Client - Furnished Bulk Sample
Type of Test: ASTM D 698 Method "A" (Standard Proctor)

Maximum Dry Density	Optimum Moisture Content
119.1 pcf	13.0 %

MOISTURE-DENSITY RELATIONSHIP DATA

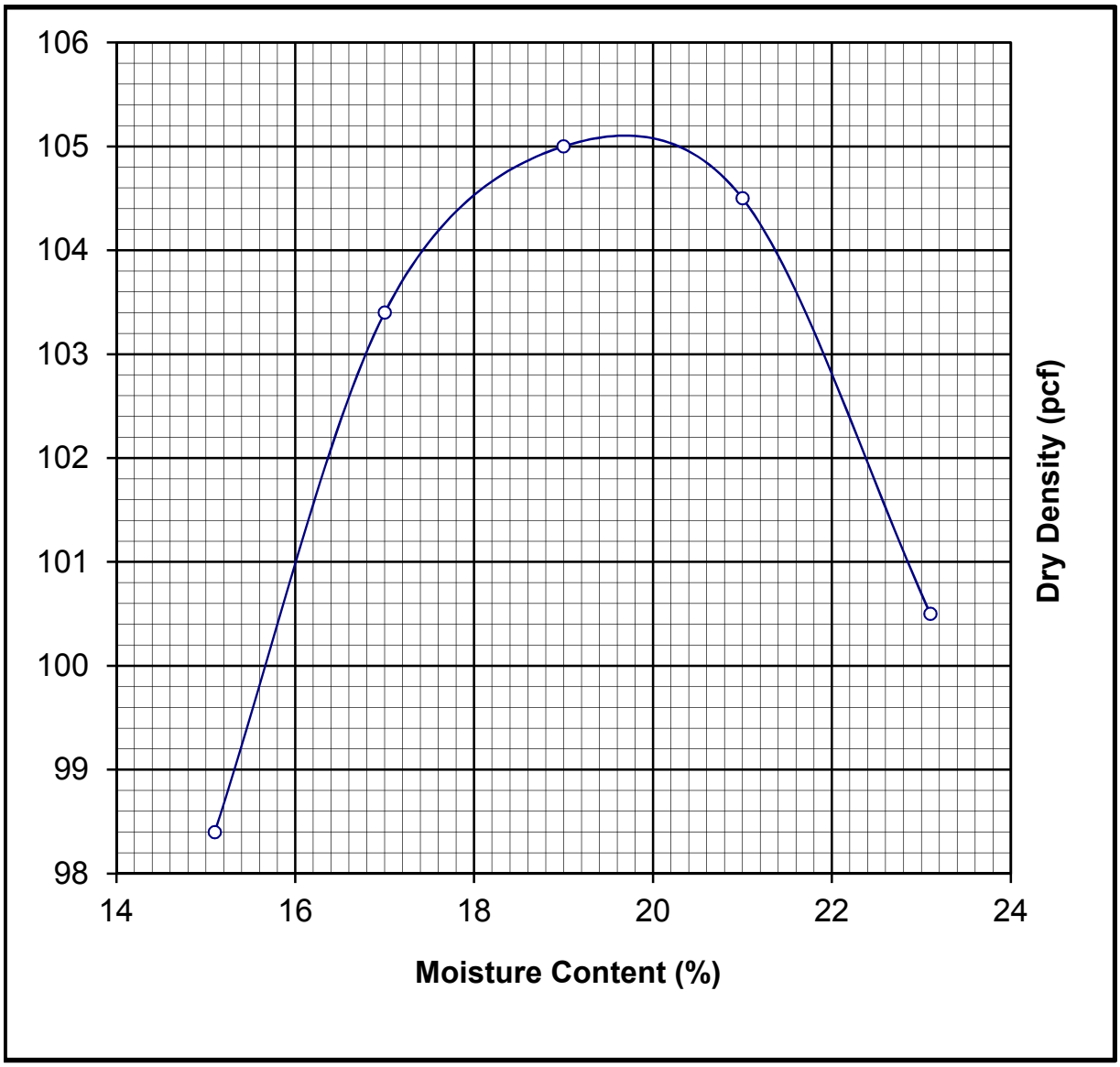


Project Number: 11788.01 Receiving Report No.: N/A Date: 07/05/14
Project: Lime Sludge Utilization
Collins Park WTP Spent Lime
Toledo, Ohio

Soil Description: Brown SANDY SILTY CLAY Mixed with 8% Lime Sludge
Source: Client - Furnished Soil and Lime Sludge
Type of Test: ASTM D 698 Method "A" (Standard Proctor)

Maximum Dry Density	Optimum Moisture Content
116.8 pcf	13.2 %

MOISTURE-DENSITY RELATIONSHIP DATA

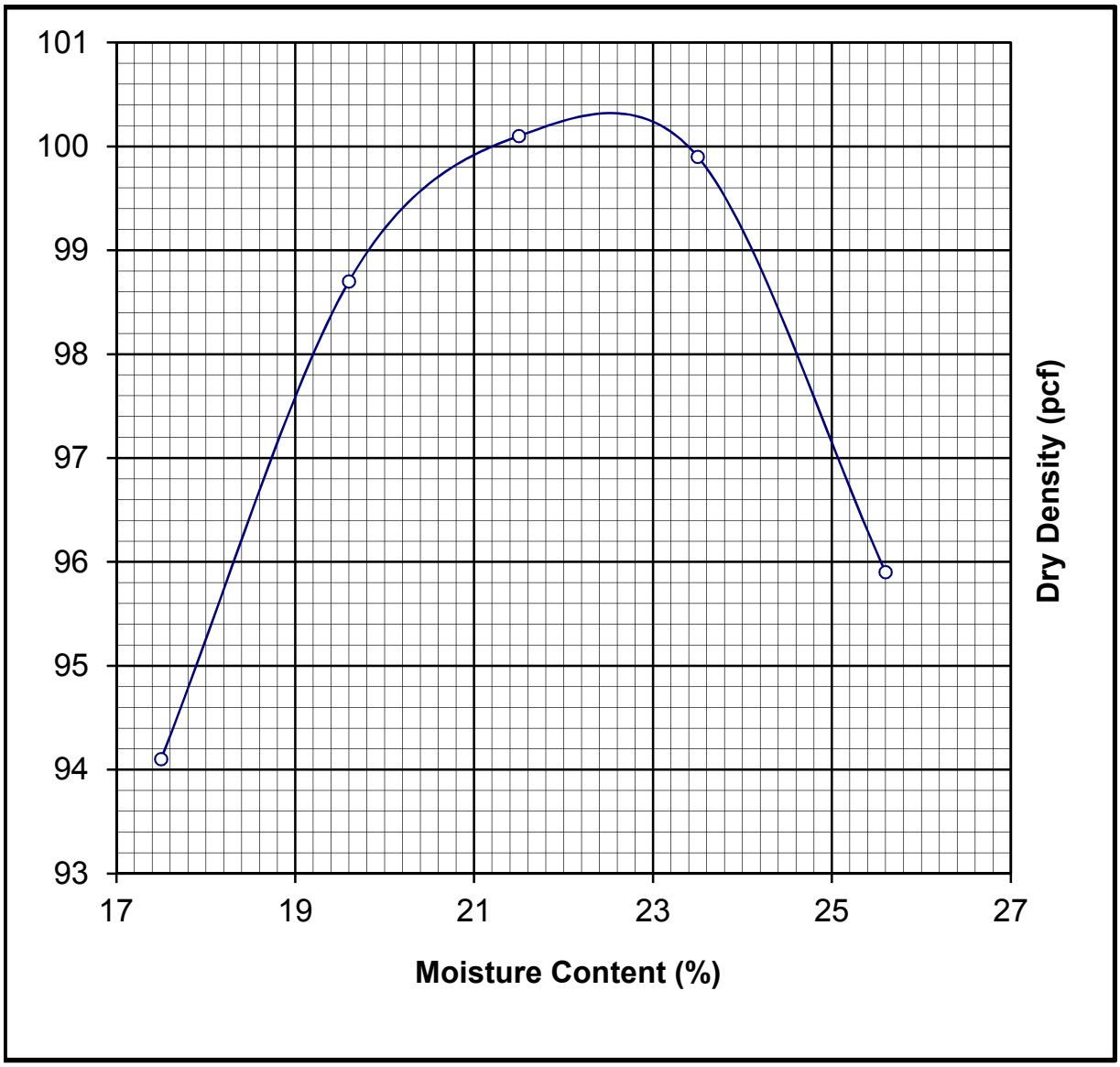


Project Number: 11788.01 Receiving Report No.: N/A Date: 07/05/14
Project: Lime Sludge Utilization
Collins Park WTP Spent Lime
Toledo, Ohio

Soil Description: Brown SANDY SILTY CLAY Mixed with 25% Lime Sludge
Source: Client - Furnished Soil and Lime Sludge
Type of Test: ASTM D 698 Method "A" (Standard Proctor)

Maximum Dry Density	Optimum Moisture Content
105.1 pcf	19.7 %

MOISTURE-DENSITY RELATIONSHIP DATA



Project Number: 11788.01 Receiving Report No.: N/A Date: 07/05/14
Project: Lime Sludge Utilization
Collins Park WTP Spent Lime
Toledo, Ohio

Soil Description: Brown SANDY SILTY CLAY Mixed with 35% Lime Sludge
Source: Client - Furnished Soil and Lime Sludge
Type of Test: ASTM D 698 Method "A" (Standard Proctor)

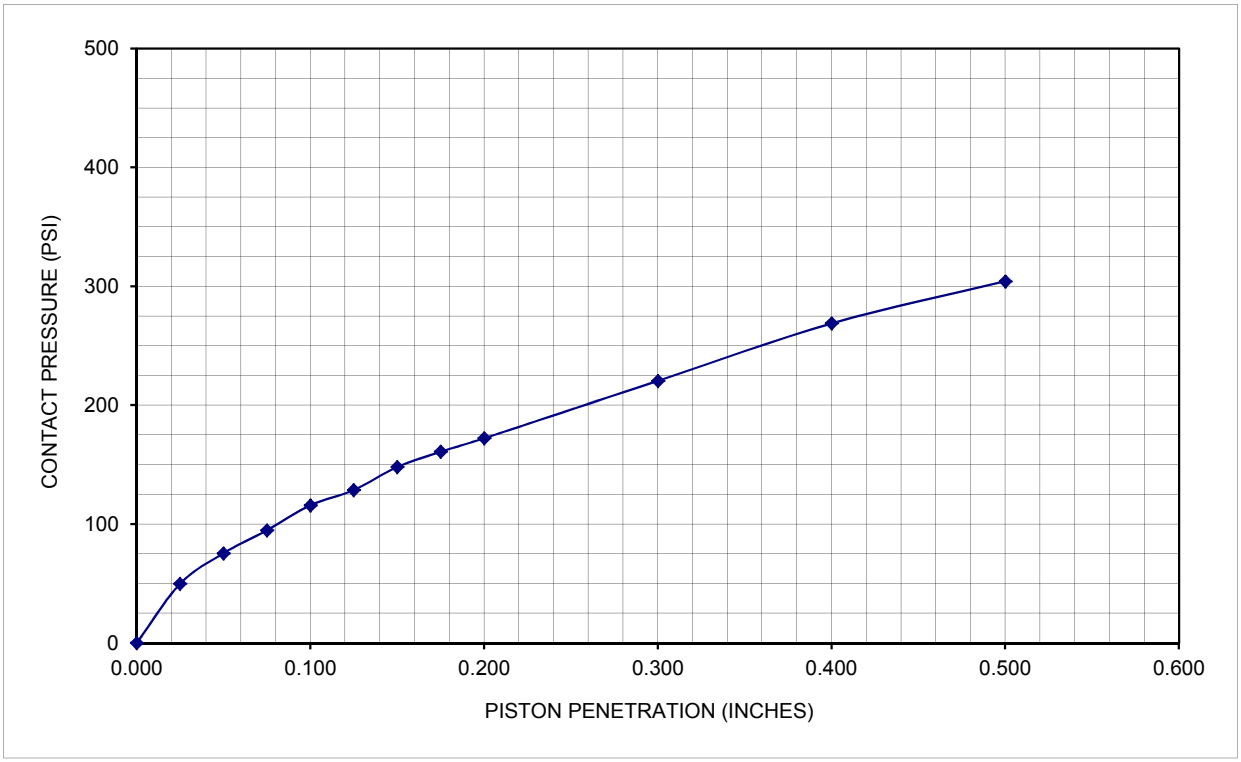
Maximum Dry Density	Optimum Moisture Content
100.3 pcf	22.5 %

CALIFORNIA BEARING RATIO

ASTM D 1883

LOAD-PENETRATION DETERMINATION

Project Name: Lime Sludge Utilization
TTL Associates Project No.: 11788.01
Sample Data: Composite Clay Soil Mixed with 8% Lime Sludge



Test specimen compacted to: 100% of the Standard Proctor (ASTM D 698) maximum dry density
Test specimen was soaked for: 0 hours

Dry Density Before Soaking:	116.8	pcf	Moisture Content:	13.3%	% Before Compaction
Dry Density After Soaking:	116.8	pcf		13.2%	% After Compaction
Swell:	0.0	%			
Surcharge:	0	pounds			

Calculated CBR:	11.6	% at 0.1 inch
	11.5	% at 0.2 inch

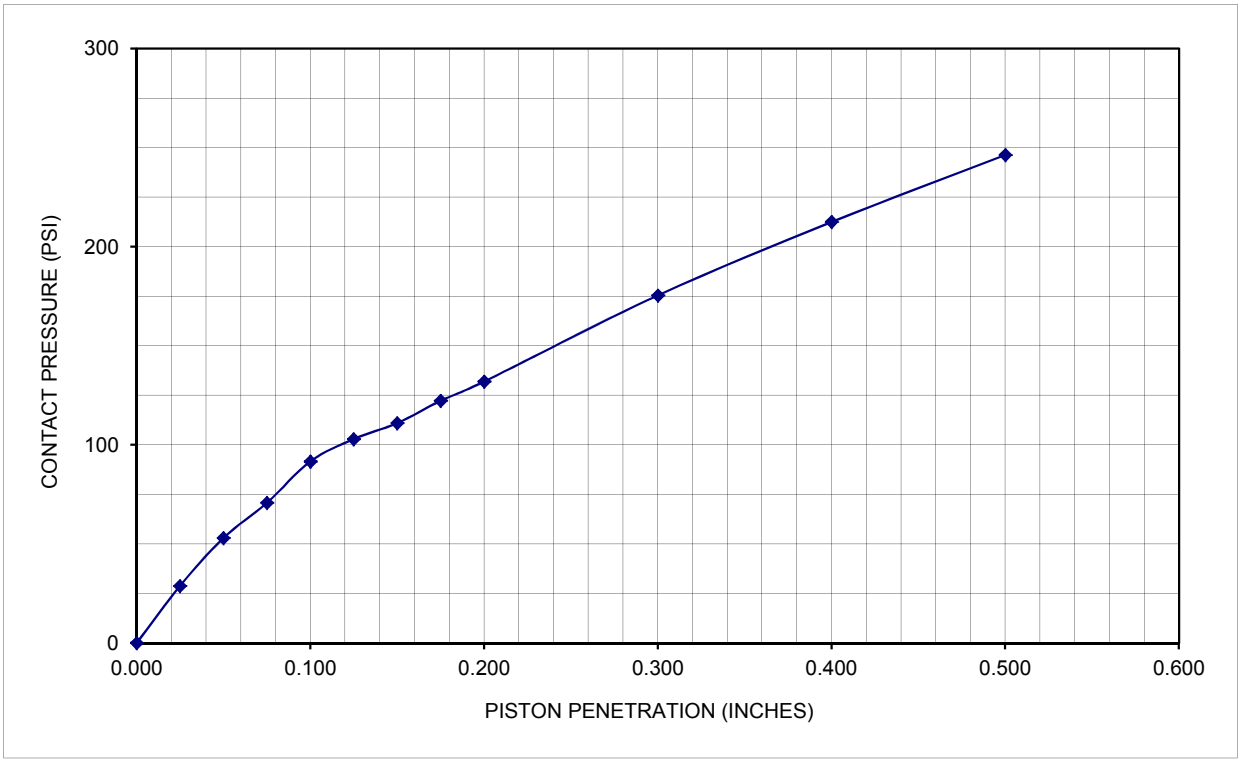
Soil Classification: Brown SANDY SILTY CLAY Mixed with 8% Lime Sludge

CALIFORNIA BEARING RATIO

ASTM D 1883

LOAD-PENETRATION DETERMINATION

Project Name: Lime Sludge Utilization
TTL Associates Project No.: 11788.01
Sample Data: Composite Clay Soil Mixed with 8% Lime Sludge



Test specimen compacted to: 101% of the Standard Proctor (ASTM D 698) maximum dry density
Test specimen was soaked for: 96 hours

Dry Density Before Soaking:	117.6	pcf	Moisture Content:	13.3%	% Before Compaction
Dry Density After Soaking:	117.3	pcf		13.2%	% After Compaction
Swell:	0.1	%		14.7%	% After Soaking,Top 1-Inch
Surcharge:	10	pounds		14.5%	% After Soaking, Average

Calculated CBR:	9.2	% at 0.1 inch
	8.8	% at 0.2 inch

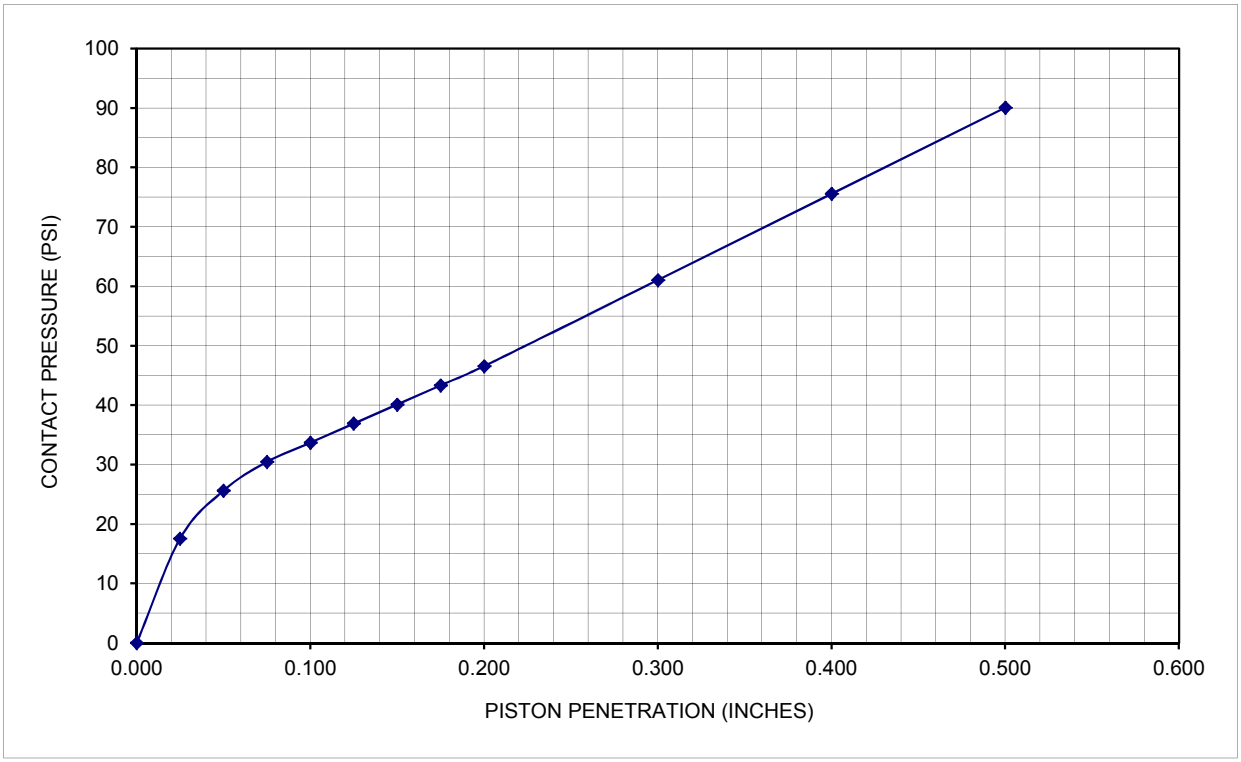
Soil Classification: Brown SANDY SILTY CLAY Mixed with 8% Lime Sludge

CALIFORNIA BEARING RATIO

ASTM D 1883

LOAD-PENETRATION DETERMINATION

Project Name: Lime Sludge Utilization
TTL Associates Project No.: 11788.01
Sample Data: Composite Clay Soil Mixed with 35% Lime Sludge



Test specimen compacted to: 100% of the Standard Proctor (ASTM D 698) maximum dry density
Test specimen was soaked for: 0 hours

Dry Density Before Soaking:	100.3	pcf	Moisture Content:	22.5%	% Before Compaction
Dry Density After Soaking:	100.4	pcf		22.4%	% After Compaction
Swell:	0.0	%			
Surcharge:	0	pounds			

Calculated CBR:	3.4	% at 0.1 inch
	3.1	% at 0.2 inch

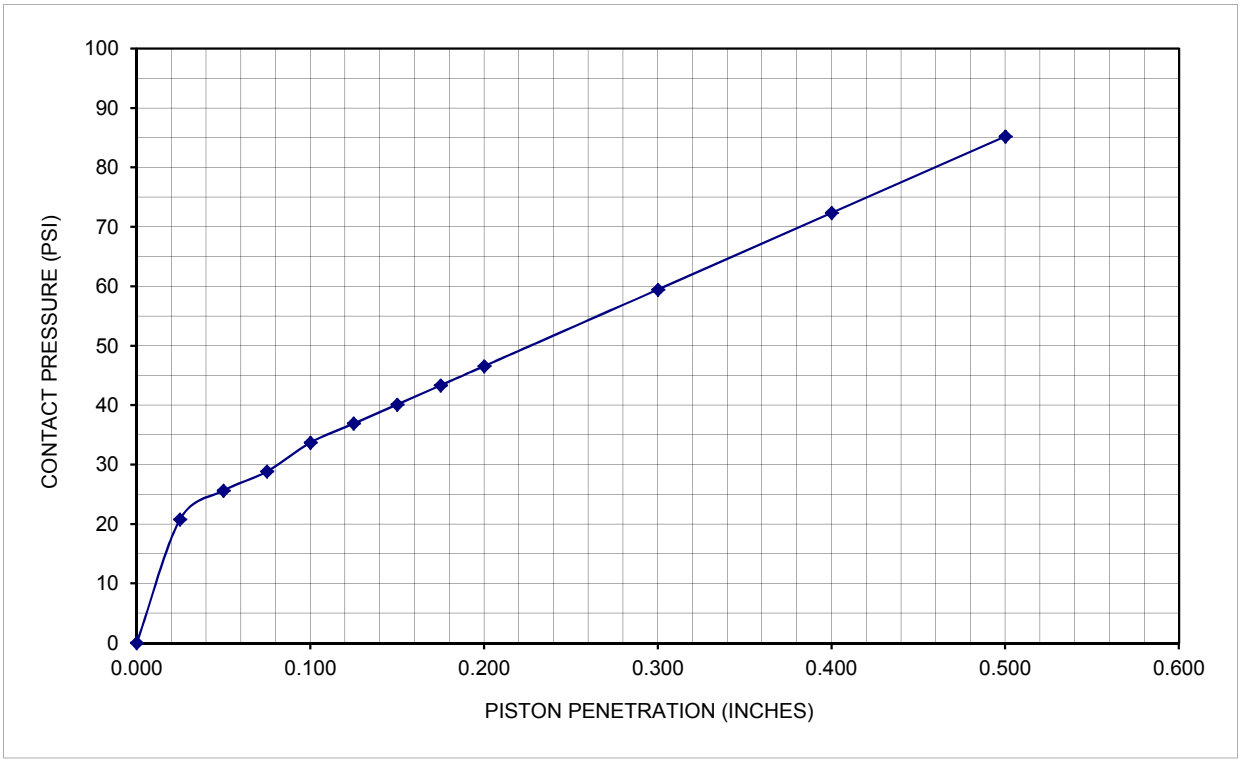
Soil Classification: Brown SANDY SILTY CLAY Mixed with 35% Lime Sludge

CALIFORNIA BEARING RATIO

ASTM D 1883

LOAD-PENETRATION DETERMINATION

Project Name: Lime Sludge Utilization
TTL Associates Project No.: 11788.01
Sample Data: Composite Clay Soil Mixed with 35% Lime Sludge



Test specimen compacted to: 101% of the Standard Proctor (ASTM D 698) maximum dry density
Test specimen was soaked for: 96 hours

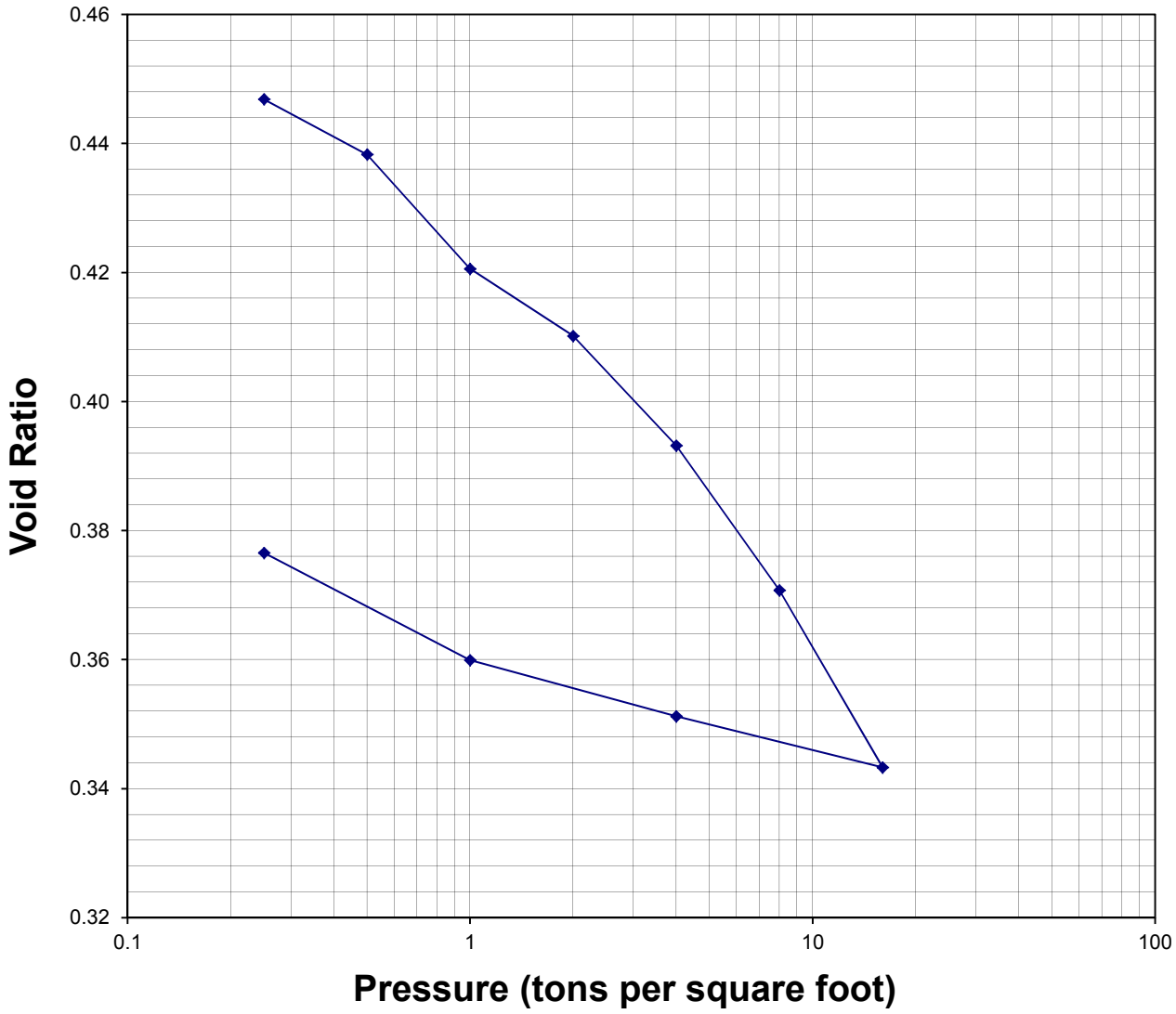
Dry Density Before Soaking:	101.6	pcf	Moisture Content:	22.5%	% Before Compaction
Dry Density After Soaking:	101.0	pcf		22.4%	% After Compaction
Swell:	0.2	%		24.8%	% After Soaking,Top 1-Inch
Surcharge:	10	pounds		24.3%	% After Soaking, Average

Calculated CBR:	3.4	% at 0.1 inch
	3.1	% at 0.2 inch

Soil Classification: Brown SANDY SILTY CLAY Mixed with 35% Lime Sludge

Project No.: 11788.01
Date: 7/12/2014
Client: Stansley Industries, Inc.
Project: Lime Sludge Utilization
Toledo, OH
Lime Sludge Content: 8% Lime Sludge
Sample No.: Client - Furnished Soil and Lime Sludge
Depth: N/A

Void Ratio Versus Log Pressure Curve



Project No.: 11788.01
Date: 7/12/2014
Client: Stansley Industries, Inc.
Project: Lime Sludge Utilization
Toledo, OH
Lime Sludge Content: 8% Lime Sludge
Sample No.: Client - Furnished Soil and Lime Sludge
Depth: N/A

Initial H= 1 inches

Pressure tsf	Final Height	Initial Height	DH	Average H	e
0.25	0.99620	1.00000	0.00380	0.9981	0.447
0.5	0.99030	0.99620	0.00970	0.9933	0.438
1	0.97810	0.99030	0.02190	0.9842	0.421
2	0.97095	0.97810	0.02905	0.9745	0.410
4	0.95925	0.97095	0.04075	0.9651	0.393
8	0.94380	0.95925	0.05620	0.9515	0.371
16	0.92490	0.94380	0.07510	0.9344	0.343
4	0.93035	0.92490	0.06965	0.9276	0.351
1	0.93635	0.93035	0.06365	0.9334	0.360
0.25	0.94780	0.93635	0.05220	0.9421	0.377

Estimated Cc: 0.091
Estimated Cr: 0.018

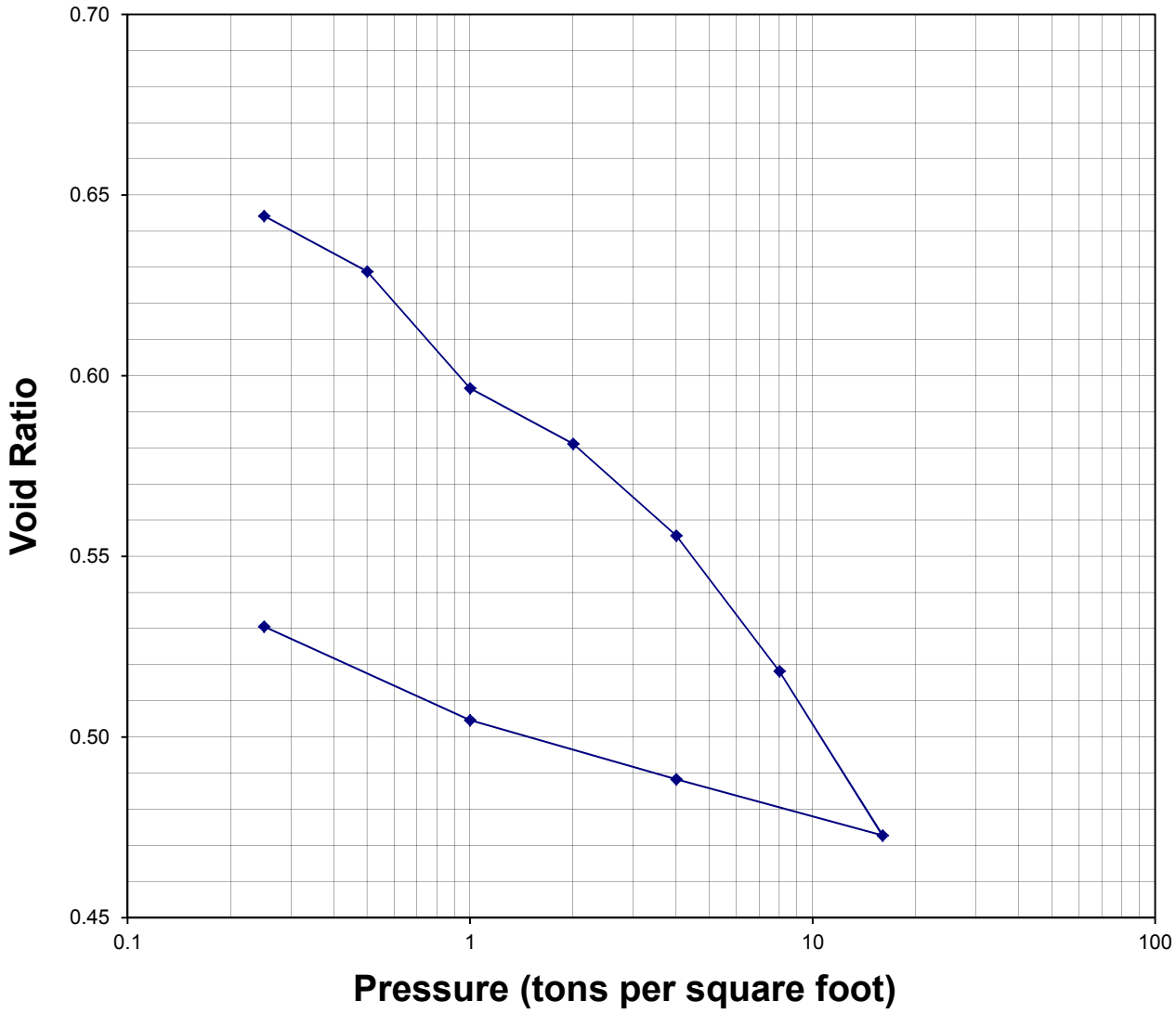
Soil Description: Brown SANDY SILTY CLAY Mixed wih 8% Lime Sludge
Specific Gravity: 2.72
Liquid Limit: N/A
Plastic Limit: N/A
Plasticity Index: N/A

Initial Water Content:	13.8 %	Final Water Content:	14.4 %
Inital Dry Density:	116.8 pcf	Final Dry Density:	123.3 pcf
Initial Void Ratio:	0.452	Final Void Ratio:	0.377
Initial Degree of Saturation:	82.7 %	Final Degree of Saturation	104.1 %

The sample for the test was compacted to 100 percent of the maximum dry density at approximately optimum moisture content as determined by ASTM D 698 (Standard Proctor). Test Method B was used with the specimen inundated during testing.

Project No.: 11788.01
Date: 7/12/2014
Client: Sansley Industries, Inc.
Project: Lime Sludge Utilization
Toledo, OH
Lime Sludge Content: 35% Lime Sludge
Sample No.: Client - Furnished Soil and Lime Sludge
Depth: N/A

Void Ratio Versus Log Pressure Curve



Project No.: 11788.01
Date: 7/12/2014
Client: Sansley Industries, Inc.
Project: Lime Sludge Utilization
Toledo, OH
Lime Sludge Content: 35% Lime Sludge
Sample No.: Client - Furnished Soil and Lime Sludge
Depth: N/A

Initial H= 1 inches

Pressure tsf	Final Height	Initial Height	DH	Average H	e
0.25	0.98975	1.00000	0.01025	0.9949	0.644
0.5	0.98050	0.98975	0.01950	0.9851	0.629
1	0.96105	0.97920	0.03895	0.9701	0.597
2	0.95180	0.96105	0.04820	0.9564	0.581
4	0.93650	0.95180	0.06350	0.9442	0.556
8	0.91390	0.93650	0.08610	0.9252	0.518
16	0.88655	0.91390	0.11345	0.9002	0.473
4	0.89590	0.88655	0.10410	0.8912	0.488
1	0.90575	0.89590	0.09425	0.9008	0.505
0.25	0.92135	0.90575	0.07865	0.9136	0.531

Estimated Cc: 0.151
Estimated Cr: 0.032

Soil Description: Brown SANDY SILTY CLAY Mixed with 35% Lime Sludge
Specific Gravity: 2.65
Liquid Limit: N/A
Plastic Limit: N/A
Plasticity Index: N/A

Initial Water Content:	23.8 %	Final Water Content:	22.1 %
Inital Dry Density:	99.7 pcf	Final Dry Density:	108.2 pcf
Initial Void Ratio:	0.661	Final Void Ratio:	0.531
Initial Degree of Saturation:	95.5 %	Final Degree of Saturation	110.4 %

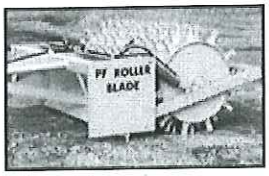
The sample for the test was compacted to 99 percent of the maximum dry density at approximately 1 percent wet of optimum moisture content as determined by ASTM D 698 (Standard Proctor). Test Method B was used with the specimen inundated during testing.

APPENDIX ~~H~~G

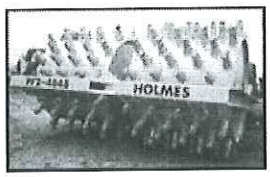
Holmes 60x60 Sheepsfoot, Pull-behind Roller
(Manufacturer's Information)

HOLMES Home

Holmes Sheepfoot Rollers & Parts



- 42x48 - 48x48 - 60x48 - 60x60
- Custom Rollers built to order
- Replacement feet, tips & hitches available



Sheepsfoot Roller Dimension Table Specifications				
	42 x 48	48 x 48	60 x 48	60 x 60
Number of Drums	2	2	2	2
Dia. of Drum	42	48	60	60
Width of Drum	48	48	48	60
Shell Thickness	1/2	1/2	1/2	1
End Thickness	1/2	1/2	3/4	1
Length of Feet	8	8	8	8
Number of Feet/Roller	176	192	240	240
Number of Rows/Drum	4	4	4	4
Number of Feet/Row/Drum	22	24	30	30
Bearing Area/Foot	6.25	6.25	6.25	6.25
Gallons per Drum	240	315	490	620
Weight Empty	6,100lbs.	6,800lbs.	9,400lbs.	18,400lbs.
Weight Filled With Water	10,300lbs	12,120lbs	17,830lbs	29,100lbs.
Diameter of Axle	2-7/16	2-7/16	2-15/16	3-7/16
Type of Bearing	Double Tapered Roller	Double Tapered Roller	Double Tapered Roller	Double Tapered Roller
Length Overall	13' 6"	14'	15'	15' 10"
Width Overall	9' 10"	9' 10"	10'	12' 2"
Height Overall	4' 10"	5' 4"	6' 4"	6' 4"

Replacement Parts Available

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